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Effect of the Teaching at the Right Level Approach on Students' Mathematical Problem-Solving Ability

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ABSTRACT

Mathematical problem-solving ability is an essential competency in mathematics learning because it enables students to understand, analyze, and solve problems systematically. However, students' mathematical problem-solving ability remains relatively low, necessitating a learning approach capable of accommodating differences in students' abilities through instruction tailored to their initial ability levels. The Teaching at the Right Level (TaRL) approach enables learning to be adapted to students' initial ability levels, thereby potentially improving mathematical problem-solving ability. This study aims to determine the effect of implementing the Teaching at the Right Level approach on mathematical problem-solving ability in the topic of linear equations. The research employed a quantitative method with a posttest-only control group design. The population of this study consisted of all eighth-grade students of SMP Negeri 15 Tasikmalaya in the 2025/2026 academic year. The research sample was selected using a cluster random sampling technique, resulting in class VIII-F as the experimental group, consisting of 33 students, and class VIII-E as the control group, consisting of 33 students. The experimental group received learning treatment using the Teaching at the Right Level approach, while the control group used the Scientific approach. Data were collected using a mathematical problem-solving ability test consisting of three essay items on the topic of linear equations, which had met the validity and reliability requirements. The data analysis techniques used included the normality test, homogeneity test, and hypothesis testing using the Independent Sample t-Test. The results showed a significant difference in mathematical problem-solving ability between students taught using the TaRL approach and those taught using the Scientific approach ($t = 4.627$, p value < 0.05). Thus, the implementation of learning using the Teaching at the Right Level approach had a positive effect on students' mathematical problem-solving ability (Cohen's $d = 1.14$).

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Introduction

Mathematical problem-solving ability is one of the competencies that students must possess. This ability supports students in thinking critically, logically, and systematically when solving various contextual problems. However, this ability remains a challenge in mathematics learning because students have diverse initial ability levels, so uniform instruction is often unable to meet the learning needs of every student (Juika et al., 2026). This condition indicates the need for an adaptive learning approach capable of accommodating differences in students' abilities. One approach considered suitable is Teaching at the Right Level, a learning approach that begins with an assessment of initial ability, then groups students based on their ability level so that the learning process, mentoring, and learning activities can be adjusted to the needs of each group (Syarifudi & Nurrahmah, 2023). With these characteristics, the Teaching at the Right Level approach has the potential to help students understand problems, devise solution strategies, carry out the solutions, and re-evaluate the results obtained, making it relevant for improving mathematical problem-solving ability.

Mathematical problem-solving ability is students' ability to identify, analyze, and solve mathematical problems, both routine and non-routine. This ability requires students not only to apply formulas or procedures but also to design strategies, select appropriate solution methods, carry out solution plans, and evaluate the results obtained (Fariha & Ramlah, 2021). In this study, mathematical problem-solving ability was measured based on Polya's problem-solving stages, namely understanding the problem, devising a plan, carrying out the plan, and looking back. These indicators were used as the basis for developing the test instrument because they can systematically describe students' thinking processes in solving mathematical problems (Permata & Ardiyanti, 2025).

Various research findings indicate that students' mathematical problem-solving ability remains relatively low. Wijaya et al. (2024) revealed that low critical thinking skills, weak mastery of basic concepts, and teacher-centered learning are factors contributing to students' low mathematical ability. In addition, Setiani et al. (2024) revealed that low mathematical problem-solving ability is indicated by students' difficulty in identifying important information, determining solution strategies, and evaluating the solutions obtained. These findings indicate that students' mathematical problem-solving ability still needs to be improved through a learning approach capable of accommodating differences in students' initial abilities.

This problem was also found in mathematics learning at SMPN 15 Tasikmalaya. Based on an interview with a mathematics teacher, it was found that many students still experience difficulty in solving mathematical problem-solving questions. This condition is supported by the results of a daily test on prerequisite material, which showed that of 33 students, 24 students (72.7%) scored below the KKTP of 75. Students also tended to perform calculations directly without first devising a solution plan and rarely rechecked the correctness of the answers obtained, so conceptual errors and calculation errors went unidentified. These findings indicate that students' mathematical problem-solving ability still needs to be improved through learning capable of accommodating differences in students' abilities.

The low level of students' mathematical problem-solving ability indicates the need for a learning strategy capable of accommodating differences in students' abilities. One approach that can be used is Teaching at the Right Level. The TaRL approach is an adaptive learning approach that begins with a diagnostic assessment to identify students' initial abilities, then groups students based on their ability level so that the learning process, learning activities, and mentoring can be adjusted to the needs of each group (Nurmaya et al., 2025). In this study, students were grouped into low, medium, and high categories. Students with low ability received reinforcement of basic concepts, students with medium ability received concept

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consolidation, while students with high ability received enrichment with more complex concepts (Cahyanita, 2025).

The implementation of the TaRL approach helps students understand problems, devise solution strategies, carry out solutions, and evaluate results in accordance with Polya's problem-solving stages. Through diagnostic assessment, ability-based grouping, and mentoring tailored to the needs of each group, students obtain learning opportunities suited to their initial abilities, allowing their mathematical problem-solving ability to develop more optimally (Palihah et al., 2024). Therefore, the Teaching at the Right Level approach is an important strategy to implement in mathematics learning (Hidayana et al., 2025). In addition, this approach is considered capable of addressing students' low ability in solving contextual problems while meeting learning needs that take into account differences in students' abilities (Khayati et al., 2024).

This study was conducted on the topic of linear equations because this material requires students to identify known and asked information, determine relationships between variables, select appropriate solution strategies, represent problems in mathematical models, and interpret and recheck the correctness of the solutions obtained. Thus, the topic of linear equations has characteristics suitable for measuring mathematical problem-solving ability based on the stages of mathematical problem-solving. Several previous studies indicate that the TaRL approach is able to improve learning outcomes and student understanding. However, these studies have focused more on learning outcomes, concept understanding, or learning motivation. Meanwhile, research examining the effect of TaRL on mathematical problem-solving ability remains relatively limited. In addition, the implementation of TaRL has been carried out more often on basic mathematics material, while its application to linear equation material has not been widely reported. In terms of context, TaRL research at the junior high school level is also still less common than research at the elementary school level. Therefore, this study was conducted to examine the effect of the Teaching at the Right Level approach on the mathematical problem-solving ability of junior high school students on the topic of linear equations.

Based on the above description, this study aims to determine the effect of the Teaching at the Right Level approach on students' mathematical problem-solving ability on the topic of linear equations by comparing the average mathematical problem-solving ability of students who received learning using the Teaching at the Right Level approach with that of students who received learning using the scientific approach. The results of this study are expected to contribute to the development of more adaptive, optimal mathematics learning that is suited to students' ability levels. Teaching at the Right Level (TaRL) is a learning approach that emphasizes the importance of adjusting learning strategies, materials, and activities to students' actual abilities, rather than solely based on grade level or age. This concept was developed by the Pratham organization in India and has become the basis for implementing various educational intervention programs in developing countries. According to Banerjee et al. (2016), this approach aims to address learning gaps that often arise from applying the same curriculum in classes that are heterogeneous in ability and to ensure that students have a solid learning foundation before moving on to more complex material. Learning with the TaRL approach can actualize the Merdeka Curriculum, which emphasizes responsive learning principles that respect individual differences in heterogeneous classes (Hadiawati et al., 2024).

The TaRL approach is a learning strategy that provides material, activities, or interventions according to students' actual abilities, particularly in mathematics learning. The TaRL approach is an inclusive learning strategy because it is able to serve diverse student abilities within a single class and has the potential to improve mathematical problem-solving ability (Diniyarti & Agustika, 2023). According to 'Ulya et al. (2024), TaRL is a teaching method that emphasizes grouping students homogeneously based on their initial abilities. The purpose of this strategy is to increase student participation and learning outcomes, particularly in classes with large ability gaps. By implementing TaRL, the learning environment is considered to become fairer and more equitable for all students, both those who are less able and those who are more talented ('Ulya et al., 2024).

Based on the various explanations provided, it can be concluded that Teaching at the Right Level (TaRL) is a learning approach that focuses on students' actual abilities through three stages, namely assessment, planning, and learning. According to Mustafa et al. (2024), there are several stages that teachers must carry out: (1) assessment, in which teachers conduct a diagnostic assessment to determine students' initial abilities. This stage forms the basis for grouping students into high, medium, and low groups regardless of grade or age; (2) planning includes planning learning strategies tailored to the assessment results, such as learning activities suited to the characteristics of each group; (3) learning emphasizes the implementation of adaptive instruction in which teachers provide interventions according to the needs of each group and continuously monitor students' progress.

Method

Reseacrh Design

This study used a quantitative approach with a quasi-experimental method. The research design used was a posttest-only control group design, a design involving two groups, namely the experimental group and the control group, which were only given a final test (posttest) after treatment. The first group received treatment (X), while the second group did not receive treatment. The group that received treatment was referred to as the experimental group, while the group that did not receive treatment was referred to as the control group. The details of the posttest-only control group design according to (Sugiyono, 2023) can be seen in Table 1.

Table 1. Research Design

Classes	Treatment	Posttest
Experiment	X	O_1
Controls	-	O_2

Description:
X = Treatment in experimental classes
O_1 = posttest Experiment Classes
O_2 = posttest Control class

Population and Sample

This study was conducted at SMP Negeri 15 Tasikmalaya among eighth-grade students in the 2025/2026 academic year, totaling 201 students divided into six classes. The population of this study consisted of all eighth-grade students across several classes. The sampling technique used was cluster random sampling. Prior to sample selection, all eighth-grade classes received the same curriculum, materials, time allocation, and teacher. According to information from the mathematics teacher, academic ability across classes was relatively homogeneous, so the two classes were considered to have comparable initial characteristics. Based on this technique, two classes were obtained as the research sample, namely class VIII-F, consisting of 33 students, as the experimental class, and class VIII-E, consisting of 33 students, as the control class. All students in both classes took part in the entire series of lessons according to their respective treatments and participated in the posttest.

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Instrument

This study used a mathematical problem-solving ability test instrument developed in the form of essay questions on the topic of linear equations. The test consisted of three essay items designed to encompass the four stages of mathematical problem-solving ability according to theory Polya's (1957). Thus, each item measured not only a single indicator but all stages of problem-solving through a scoring rubric that had been developed. In addition, the three items represented all the learning objectives for the linear equation material, so the instrument had sufficient content coverage and indicators to measure students' mathematical problem-solving ability. The blueprint of the mathematical problem-solving ability test instrument is presented in Table 2.

Table 2. Blueprint of the Mathematical Problem-Solving Ability Test

Learning Outcomes	Learning Objectives	Example Task
At the end of phase D students can distinguish some non-linear functions from linear functions graphically.	Explaining Cartesian coordinates Solving problems with the concept of gradient Determining the solution of a straight-line equation	*An architect is designing the interior of a building. The main wall will follow a line passing through the points (0,3) and (2,0). To ensure the building structure is strong and well-organized, the architect wants the floor to be perpendicular to the main wall. The floor is designed to follow the equation* $2x + ay - 3 = 0$*, but the value of a is unknown. To ensure that the main wall and the floor are truly perpendicular, the architect must determine the value of a. What is the value of a so that the main wall and the floor are perpendicular to each other?*

Before implementation, the instrument was first tested for validity and reliability. The trial was administered to 30 ninth-grade students at SMP Negeri 15 Tasikmalaya. Ninth-grade students were selected based on the consideration that they had already studied linear equation material, so they had academic characteristics suitable for testing the instrument's quality without affecting the research sample. The trial results were used to assess the feasibility, accuracy, and consistency of the instrument in measuring the construct that was the focus of the study.

Instrument Validity Test

Validity testing was conducted through an instrument trial stage to determine the extent to which respondents were able to accurately understand and interpret the questions posed by the researcher. To determine the level of validity, the coefficient values obtained first needed to be interpreted. To determine the validity level of the evaluation tool, item validity criteria were used. The validity test results using Software Statictics are presented in Table 3.

Table 3. Validity Test Results

Question Item	Correlation Coefficient r calculated	r Table (n = 30)	Conclusion	Level
1	0,78		Valid	Height
2	0,66	0,36	Valid	Height
3	0,75		Valid	Height

Based on Table 3, all items had a correlation coefficient greater than the r table value (0.36), so all items were declared valid and suitable for use in the study.

Istrumen Reliability Test

The reliability test shows an index indicating whether a measuring instrument can be trusted or relied upon. The reliability test results, obtained with the help of Software Statictics, are presented and can be interpreted in Table 4.

Table 4. Reliability Test Results

Cronbach's Alpha	r_{tabel} (n = 30, $\alpha = 0,05$)	Conclusion
0,57	0,36	Reliable

Based on Table 4, the reliability test results obtained a Cronbach's Alpha of 0.57. Meanwhile, the r table value at a significance level of α = 0.05 with a sample size of 30 was 0.36, so the test instrument was declared reliable. Because the Cronbach's Alpha value was greater than the r table value (0.57 > 0.36), the instrument could be used as a research instrument.

Data Collection

The study was conducted in both sample classes on the topic of linear equations. In the experimental class, before instruction, students were given a diagnostic test to group them according to ability level in accordance with the Teaching at the Right Level (TaRL) approach. The learning process in the experimental class was then conducted using the TaRL approach, while the control class was taught using the scientific approach. After all instruction was completed, both classes were given a posttest in the form of essay questions to measure students' mathematical problem-solving ability. Data were obtained through the administration of the posttest given to the experimental and control groups after the entire series of lessons had been completed. This posttest instrument served as the main tool for measuring students' mathematical problem-solving ability. The data obtained were then analyzed using normality tests, homogeneity tests, and t-tests. The data collection procedure in this study is presented simply in Figure 1.

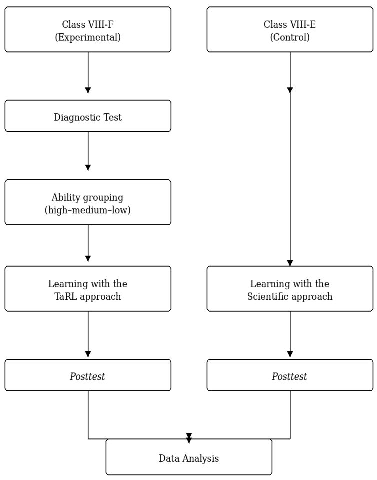

Figure 1. Data Collection Flow

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Data Analysis

The posttest data obtained were then analyzed using Software Statictics. The stages of data analysis in this study included descriptive statistical analysis, normality testing, homogeneity testing, and hypothesis testing. The normality test used the Shapiro-Wilk test to examine whether the data distribution was normal. If the data were declared normally distributed, the analysis was continued with a homogeneity test using Levene's test to determine the equality of variance between groups. After all assumptions were met, hypothesis testing was carried out using an independent samples t-test to determine whether there was a difference between the experimental and control groups. In addition to hypothesis testing, this study also calculated the effect size to determine the magnitude of the effect of implementing learning with the Teaching at the Right Level (TaRL) approach on students' mathematical problem-solving ability. The effect size was calculated using Cohen's d, obtained from the difference between the mean posttest scores of the experimental and control classes divided by the pooled standard deviation.

Research Findings

Learning in the experimental class was conducted using the Teaching at the Right Level (TaRL) approach over six sessions. Before instruction began, students were given a diagnostic test to identify their initial ability as the basis for grouping them into high, medium, and low ability categories. Based on the results of this grouping, the teacher adjusted the material, learning activities, question difficulty level, and form of mentoring according to the needs of each group. Students with low ability received reinforcement of basic concepts through more intensive guidance, students with medium ability received concept consolidation through varied exercises, while students with high ability received more complex problems to develop higher-order thinking skills. During the learning process, the teacher provided mentoring and feedback according to the learning progress of each group, making instruction more adaptive to students' abilities.

Learning in the control class was conducted using the scientific approach over five sessions. The learning process followed the stages of observing, questioning, gathering information, reasoning, and communicating learning outcomes. All students received the same material, learning activities, exercises, and mentoring, without grouping based on initial ability. The teacher guided the learning process classically, provided explanations and reinforcement of concepts, and facilitated discussion and presentation of students' learning outcomes. After all instruction in both classes had been completed, students were given the same posttest to measure their mathematical problem-solving ability, and the results were then analyzed using descriptive statistics, prerequisite tests, hypothesis testing, and effect size.

The following presents the mathematical problem-solving ability test data for the experimental and control classes.

Table 5. Descriptive Statistics Result

Test Results	N	Range	Min	Max	Sum	Mean	Std. Deviation	Variance
Experiment	33	56	40	96	2354	71,33	15,202	231,104
Control	33	64	25	88	1743	52,82	17,245	297,403

Data analysis was used to answer the research problem formulation and to test the proposed hypothesis through data presentation. The data analysis in this study is presented below.

Normality Test

The normality test is one of the prerequisite tests to satisfy the assumption of normality for data analysis. This test was conducted to determine whether the data distribution was normal. This test uses the shapiro-wilk test with the results presented in Table 6.

Table 6. Normality Test Results

Posttest	W_{count}	W_{table}	Alpha
Experiment	0,949	0,934	0,05
Control	0,965		

Based on Table 6, the normality test results using Shapiro-Wilk obtained a calculated W value of 0.949 for the experimental class, while the control class obtained a calculated W value of 0.965. The mathematical problem-solving ability test data were declared normally distributed since the calculated W value exceeded the table W value. Thus, it can be concluded that the problem-solving ability test data for both classes came from a normally distributed population.

Homogeneity Test

The homogeneity of variance test between the experimental and control classes was conducted using Levene's Statistic with the help of Software Statictics. The results of the variance homogeneity test are presented in Table 7.

Table 7. Homogeneity Test Results

Levene Statistic	df1	df2
0,208	1	64

Based on Table 7, the homogeneity test results using Levene's test obtained a W value of 0.208. The mathematical problem-solving ability test data were declared homogeneous since W was smaller than the F table value. The F table value, obtained from the statistical table at $\alpha = 0.05$, was 3.99. Because $0.208 < 3.99$, H_0 was accepted. Thus, it can be concluded that the experimental and control groups had equal variance (homogeneous). Therefore, the prerequisite tests for hypothesis testing were satisfied.

Hypothesis Test

Since the prerequisite tests of normal distribution and homogeneity were satisfied, hypothesis testing could be conducted using a t-test. The t-test used was the Independent Sample t-Test. This test was conducted to determine whether the average mathematical problem-solving ability of students in the experimental class, taught using the Teaching at the Right Level approach, was better than that of students in the control class, taught using the scientific approach. The test results are presented in Table 8.

Table 8. Independent *Sample t-test* results

t	df	p-value (Sig. 2-tailed)	Decision
4,627	64	< 0.001	H_0 Rejected

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Based on Table 8. P < 0.001 was obtained, meaning the p-value $<$ 0,05 so H_0 was rejected and H_1 was accepted, indicating that students' mathematical problem-solving ability using the Teaching at the Right Level approach was better than that of students using the scientific approach. Thus, it can be concluded that the implementation of learning with the Teaching at the Right Level approach has an effect on students' mathematical problem-solving ability.

Effect Size

The independent samples t-test results showed a significant difference between the mathematical problem-solving ability of students in the experimental and control classes (p < 0.001). To determine the magnitude of the effect of implementing learning with the Teaching at the Right Level (TaRL) approach, the effect size was calculated using Cohen's d. The calculation results showed a Cohen's d value of 1.14, which falls into the high category. This indicates that the implementation of learning with the Teaching at the Right Level (TaRL) approach had a large effect on students' mathematical problem-solving ability.

Discussion

The research findings indicate that the Teaching at the Right Level (TaRL) approach is able to support the development of students' mathematical problem-solving ability. The basic principle of this approach is to place students' initial ability as the basis for learning planning. Through diagnostic assessment conducted before instruction, teachers can identify students' initial ability and group them based on their level of mastery of the material. In its implementation in the experimental class, students were grouped into low, medium, and high categories. Each group received learning activities tailored to its ability level. The low-ability group focused on reinforcing basic concepts of linear equations through simple examples with more intensive teacher guidance. The medium-ability group was given problems of moderate difficulty that encouraged students to connect concepts with contextual situations, while the high-ability group was given more complex problems so they could develop solution strategies independently. During the learning process, the teacher provided scaffolding according to the needs of each group and facilitated discussion at each learning stage. This implementation of instruction tailored to students' learning readiness allowed each student to obtain a learning experience suited to their needs, making the learning process more optimal and meaningful.

Theoretically, the results of this study support the view of Banerjee et al. (2016), who state that learning is optimal when tailored to students' ability level rather than based solely on age or grade level. In the TaRL approach, students with low ability receive reinforcement of basic concepts, students with medium ability receive opportunities to deepen their conceptual understanding, while students with high ability are given more complex challenges. Learning with this approach provides students with opportunities to build conceptual understanding gradually, thereby minimizing gaps in learning ability (Hadiawati et al., 2024). Good conceptual understanding is an important prerequisite for developing mathematical problem-solving ability, as it helps students understand problems, plan solution strategies, carry out solution procedures, and recheck the results obtained in accordance with Polya's stages (Pramuswara & Haerudin, 2024). Thus, learning tailored to students' initial ability has the potential to support the development of each problem-solving stage more optimally. This finding also reinforces the view of Nurhalisa et al. (2022), who state that mathematical problem-solving ability depends not only on mastery of formulas but also on students' ability to construct logical reasoning and select appropriate solution strategies.

When examined based on Polya's problem-solving indicators, the implementation of the Teaching at the Right Level approach appears to be most helpful to students at the stage of devising a plan. This indicates that instruction tailored to students' initial ability, together with scaffolding provided according to their needs, is able to help students determine appropriate solution strategies before solving problems. In addition, the reinforcement of basic concepts for the low-ability group, the provision of graduated exercises for the medium-ability group, and the assignment of more complex problems to the high-ability group also supported students' ability to understand problems, carry out solution plans, and recheck their work. Thus, the implementation of the Teaching at the Right Level approach not only helped students master mathematical concepts but also facilitated the development of problem-solving ability at every Polya stage.

The results of this study are consistent with the research of Diniyarti and Agustika (2023), which showed that the implementation of the Teaching at the Right Level approach is able to improve the quality of mathematics learning through instruction adjusted to students' initial ability. This similarity is evident in the implementation of diagnostic assessment as the basis for grouping students and in providing learning activities tailored to the needs of each group, allowing students to obtain a more meaningful learning experience. In addition, the research of Hadiawati et al. (2024) revealed that grouping students based on initial ability enables teachers to provide more appropriate interventions, making the learning process more optimal. This similarity in results indicates that the success of implementing the TaRL approach is reflected not only in improved learning outcomes in general but also in mathematical problem-solving process ability. Nevertheless, this study differs from previous studies. Diniyarti and Agustika Research (2023) focused more on improving mathematics learning outcomes, while Hadiawati et al. (2024) focused on optimizing instruction through grouping students based on initial ability. In contrast to these studies, this study specifically examines the effect of the Teaching at the Right Level approach on students' mathematical problem-solving ability on the topic of linear equations, based on Polya's problem-solving indicators. Thus, this study not only shows that the Teaching at the Right Level approach affects students' learning achievement but also provides insight into how this approach supports students' thinking processes in solving mathematical problems.

In this instruction, students do not merely receive information from the teacher but are guided to understand problems, plan solutions, carry out strategies, and recheck the results of their solutions through exploration and discussion activities. In addition, Lev Vygotsky's theory also supports the implementation of this instruction because it emphasizes the importance of social interaction, group discussion, and the provision of scaffolding to help students achieve optimal cognitive development (Zaretsky, 2024). Grouping students based on ability level within the Teaching at the Right Level approach enables teachers to provide more targeted assistance according to each student's needs.

The improvement in mathematical problem-solving ability observed in this study is presumed to result from students receiving different learning activities tailored to their ability level. Students with low ability received more structured activities, allowing them to understand basic concepts gradually. Meanwhile, students with medium and high ability received more challenging activities that encouraged them to analyze problems, identify patterns, and independently develop solution strategies. This condition allowed each student to learn at an appropriate level of difficulty, making the cognitive load experienced more proportional.

Compared with previous studies, this study offers several novel aspects. Most research on TaRL has focused on improving learning outcomes, numeracy literacy, or understanding of mathematical concepts. Astuti et al. (2024) showed that the Teaching at the Right Level approach can improve mathematics learning outcomes and make the learning process more

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effective and participatory. In addition, Nurmaya et al.(2025) reported that the Teaching at the Right Level approach is effective in improving students' numeracy literacy through instruction tailored to students' ability levels. Meanwhile, Nurhikmah et al. (2025) showed that the Teaching at the Right Level approach combined with reflective activities is able to improve students' understanding of mathematical concepts. In contrast to these studies, this study specifically examines the effect of the TaRL approach on students' mathematical problem-solving ability on the topic of linear equations. In addition, problem-solving ability was analyzed based on Polya's indicators, which include understanding the problem, devising a plan, carrying out the plan, and looking back. Thus, this study not only demonstrates the role of TaRL in students' learning achievement but also provides insight into its contribution to students' thinking processes in solving mathematical problems.

Nevertheless, the results of this study are not entirely attributable to the implementation of the TaRL approach. Several other factors may also affect students' mathematical problem-solving ability, such as students' initial ability, teachers' skill in providing scaffolding, limited instructional time, the characteristics of the questions used, and classroom conditions during the learning process. Therefore, the results of this study need to be interpreted within the context in which the research was conducted. These findings imply that the TaRL approach can serve as an alternative for mathematics instruction in heterogeneous classes, as it enables teachers to provide learning services more suited to students' needs. Thus, the TaRL approach has the potential to support the implementation of the Merdeka Curriculum, which emphasizes differentiated, student-centered learning.

Conclusion

Based on the research results, the average mathematical problem-solving ability of students in the experimental class was higher than that of students in the control class, namely 71.33 and 52.82, respectively. The results of the Independent Samples t-Test also showed a significant difference between the two groups (p-value < 0.05). In addition, the effect size analysis using Cohen's d showed a value of 1.14, which falls into the high category. Thus, the Teaching at the Right Level approach has an effect on students' mathematical problem-solving ability on the topic of linear equations. The contribution of this study lies in providing empirical evidence regarding the implementation of the Teaching at the Right Level approach in developing the mathematical problem-solving ability of eighth-grade junior high school students, analyzed based on Polya's problem-solving stages. The results of this study also broaden the body of research on the Teaching at the Right Level approach, which has thus far focused mainly on learning outcomes, numeracy literacy, and understanding of mathematical concepts. These findings imply that the Teaching at the Right Level approach can serve as an alternative for mathematics instruction in eighth-grade junior high school classes with diverse student abilities, particularly on the topic of linear equations. This implication is limited to the context of a study involving two classes at a single school and therefore cannot yet be generalized to different materials, grade levels, or learning conditions. This study still has limitations, as it was conducted at a single school with content limited to linear equations, so the results cannot yet be broadly generalized. Therefore, further research is recommended to implement the TaRL approach on other mathematics topics, involve more diverse samples, and examine its effect on other mathematical abilities, such as critical thinking, creative thinking, mathematical communication, and mathematical reasoning.

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Conflict of Interest

The author declares no conflict of interest.

Auhor Contributions

R.K.S conceived the research idea presented and collected the data. The other two authors (I.N. and R.H.) actively participated in theory development, methodology, data organization and analysis, discussion of the results, and approval of the final version of the manuscript. All authors declare that the final version of this paper has been read and approved. The total percentage of contribution for the conceptualization, preparation, and correction of this paper is as follows: R.K.S.: 40%, I.N.: 30%, and R.H.: 30%.

Data Availability Statement

The authors state that data supporting the results of this study will be provided by the relevant author, [I.N.], if reasonably requested.

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