

The Implementation of the Teaching at the Right Level (TaRL) Approach to Improve Mathematical Problem-Solving Skills of Third Grade Students

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ARTICLE INFO

Article history:

DOI:

[10.30595/pssh.v24i.1596](https://doi.org/10.30595/pssh.v24i.1596)

Submitted:

June 14, 2025

Accepted:

July 06, 2025

Published:

July 23, 2025

Keywords:

Teaching at the Right Level (TaRL), Mathematical Problem-Solving, Third-Grade Students

ABSTRACT

This study aims to improve the mathematical problem-solving ability of third-grade elementary school students through the implementation of the Teaching at the Right Level (TaRL) approach. This research was conducted as Classroom Action Research (CAR) over two cycles during the second semester of the 2024/2025 academic year. The study was carried out collaboratively between a classroom teacher and university supervisor to design, implement, and evaluate the learning process. The subjects were third-grade elementary students with varying levels of understanding in basic mathematical concepts, particularly in arithmetic and simple problem solving. Instruments used in the study included teacher and student observation sheets, student worksheets (LKPD), lesson plans (RPP), and pre- and post-tests to measure student abilities. The TaRL approach was implemented by grouping students according to their level of understanding and providing appropriate materials and activities for each level. This strategy ensured that students were not forced to follow lessons that were too difficult or too easy for them. Data analysis was conducted using narrative description for qualitative data and descriptive statistics for quantitative data. The results showed a significant increase in students' ability to solve mathematical problems. The average score in the pre-test was 28.56, which increased to 81.80 by the end of cycle II. This indicates that the TaRL approach is highly effective in helping third-grade students better understand and confidently engage with mathematical material. It can be concluded that the Teaching at the Right Level (TaRL) approach is a suitable solution for addressing learning gaps in lower grades and can create a more enjoyable and ability-appropriate learning environment for each child.

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1. INTRODUCTION

Mathematics is a fundamental subject in education as it trains students to think logically, systematically, and structurally. One essential skill to develop in mathematics learning is students' ability to solve problems. However, in practice, many students still face difficulties in understanding basic mathematical concepts and applying them in real-life situations.

As emphasized by the National Council of Teachers of Mathematics (NCTM, 2000), the main goal of mathematics learning is not merely to understand formulas or numbers, but also to strengthen communication,

reasoning, connections, problem-solving, and the representation of mathematical ideas. To achieve this, students must be trained to express their mathematical thinking when encountering problems, so they can independently find appropriate solutions.

According to Susanta et al. (2006), mathematical problem-solving is the process of applying students' knowledge, skills, and understanding to solve unfamiliar problems. Polya (1973) also described problem-solving as an effort to find solutions through a non-trivial thinking process. Thus, problem-solving skills are crucial to develop, as they involve not only conceptual mastery but also general cognitive abilities.

Research by Lase (2020) revealed that among 40 students studied, about 70% could not identify key information from problems, 75% could not design a solving strategy, 80% struggled with calculations, and 90% were not accustomed to reviewing their answers. This issue is worsened by teacher-centered learning approaches, where students are passive listeners rather than active learners.

Similarly, Gultom (2019) stated that mathematics teaching is still often conducted using conventional methods. Teachers tend to deliver formulas directly without helping students understand the meaning or application. This inhibits students' creativity and conceptual understanding. Hutauruk (2018) added that such approaches lead to poor self-awareness, weak critical thinking skills, and limited communication abilities in the learning environment.

In this context, teachers must act not only as information providers but also as facilitators who create active, meaningful learning environments that encourage direct student engagement. Teachers must ensure that learning activities help students develop accurate and deep conceptual representations.

One promising approach is Teaching at the Right Level (TaRL). According to Josmartin (2022), TaRL focuses on students' actual learning levels, not their grade or age. This makes it more responsive to individual learning needs, especially for students lagging in basic math skills. Laksman (2019) showed that TaRL allows students to be grouped by mastery level, enabling teachers to tailor instruction effectively. Developed by India's Pratham Education Foundation, TaRL emphasizes foundational literacy and numeracy mastery as the basis for future learning.

In practice, TaRL requires regular assessments to track learning progress. Students with similar levels are grouped and guided with suitable materials. This ensures students not only understand the material but also engage actively and build confidence in solving math problems.

Based on observations and interviews conducted during field teaching practice (PPL II) at an elementary school, it was found that third-grade students still struggled to grasp statistical material. They showed limited understanding of basic concepts such as mean and median. Many students also had trouble interpreting statistical problems that required data reading and analysis skills.

A lack of critical thinking was also a major factor. Students were not accustomed to reviewing given information, identifying relevant data, and drawing accurate conclusions. This highlights the need for a more adaptive learning approach, such as TaRL.

Considering these issues, this study aims to explore the effectiveness of the Teaching at the Right Level (TaRL) approach in improving mathematical problem-solving skills of third-grade elementary students, particularly in statistics. It also integrates the TaRL approach with the Problem Based Learning (PBL) model to create a more active and meaningful learning environment.

It is hoped that the results of this study can inform teachers, schools, and other stakeholders in designing more appropriate, effective, and enjoyable learning strategies that help students deeply understand mathematical concepts and become proficient problem solvers.

2. METHOD

This research was conducted at SD N 2 Purwokerto Wetan using a Classroom Action Research (CAR) approach. The study followed the Kemmis and McTaggart model, which includes four cyclical stages: planning, action, observation, and reflection. The research was carried out during the even semester of the 2024/2025 academic year, specifically from April to May.

The research subjects were 16 third-grade students at SD N 2 Purwokerto Wetan, consisting of 8 boys and 8 girls. The research was conducted over two cycles, each consisting of two learning sessions.

Each cycle involved the following stages:

1. Planning
 - a. The researchers prepared learning tools, including syllabi, lesson plans (RPP), and student worksheets (LKPD).
 - b. Evaluation instruments such as assessment questions and observation guides were prepared.
 - c. Instructional media supporting Problem Based Learning (PBL) based on the Teaching at the Right Level (TaRL) approach were also designed.
2. Implementation of Action
 - a. Learning activities were conducted using the PBL model and TaRL approach, where students were grouped based on ability levels identified through initial assessments.

- b. Students actively engaged in group discussions and solved real-world problems related to statistical material.
- 3. Observation
 - a. During the activities, researchers and the classroom teacher observed student engagement, the effectiveness of the TaRL strategy, and progress in solving statistical problems.
 - b. Observations also included class atmosphere, student enthusiasm, and challenges encountered during learning.
- 4. Evaluation and Reflection
 - a. After learning activities concluded, evaluations were conducted to measure students' mathematical problem-solving skills.
 - b. The results were analyzed to identify strengths and areas for improvement in each cycle.
 - c. Reflection findings were used to plan improvements for the subsequent cycle.

Table 1. Indicators of Problem-Solving Ability According to Sudarman (2007)

Problem-Solving Indicator	Description of Student Activities
Identifying elements in the problem	Students are able to recognize the known information, what is being asked, and whether the provided information is sufficient to solve the problem.
Constructing a mathematical model	Students are capable of translating the problem situation into a mathematical model and solving it correctly.
Applying a solution strategy	Students can choose an appropriate strategy to solve mathematical problems as well as contextual problems outside of mathematics.
Interpreting and verifying results	Students are able to explain the final result in the context of the problem and recheck the accuracy of the given answer.

Data Collection and Analysis Techniques: data for this study were collected through two main methods: written tests and observation sheets. The written tests were used to assess students' mathematical problem-solving abilities, while observations were conducted to capture students' activities and engagement throughout the learning process.

The collected data consisted of both quantitative data (test results) and qualitative data (observational records and field notes). Data analysis employed both qualitative-descriptive and quantitative-comparative approaches. Students' scores from the pre-intervention (baseline) phase were compared with their scores in Cycle I and Cycle II to identify progress or improvements in learning outcomes.

Cycle I Implementation: in the first cycle, the learning process focused on basic statistical concepts. Students were grouped based on the results of the initial assessment according to the Teaching at the Right Level (TaRL) approach. The lessons were implemented using the Problem-Based Learning (PBL) model. Students were encouraged to understand statistical concepts through contextual activities and collaborative group work.

The results of Cycle I showed improvement in the problem-solving abilities of most students. However, several challenges were still identified, particularly in understanding problem instructions and applying effective problem-solving strategies.

Cycle II Implementation: based on reflections from Cycle I, the learning process in Cycle II was refined to better address the specific needs of students. The teacher provided more intensive support to lower-performing groups and introduced more varied and engaging problem prompts.

The evaluation analysis of Cycle II showed a more significant improvement compared to Cycle I. Students demonstrated increased confidence in solving problems, were more active in discussions, and exhibited better skills in interpreting data presented in tables and diagrams.

3. RESULTS AND DISCUSSION

RESULTS

1. Pre-Cycle Phase

At the initial stage prior to the implementation of the Teaching at the Right Level (TaRL) approach through the Problem-Based Learning (PBL) model, a baseline assessment was conducted to measure the mathematical problem-solving abilities of 16 third-grade students. A pretest instrument was administered to determine the extent of students' existing problem-solving skills. The results indicated that only 14.81% of students met the Minimum Mastery Criteria (MMC), suggesting that the majority of students were still struggling to understand and solve mathematical problems. In addition, observational data revealed that most students had not yet demonstrated a strong sense of responsibility in completing the tasks and exercises given by the teacher.

Table 2. Recapitulation of Students' Mathematical Problem-Solving Ability in the Pre-Cycle

Ability Level	Score Range	Number of Students	Average Score	Percentage (%)
Low (A)	< 70	13	50.13	81.25%
Medium (B)	71–85	3	72.75	18.75%
High (C)	86–100	0	–	0%
Total		16	122.88	100%

These data indicate that the majority of students were still classified in the low ability category. Based on this finding, an intervention was conducted through the Teaching at the Right Level (TaRL) approach combined with the Problem-Based Learning (PBL) model, implemented in two cycles.

2. Cycle I

a. Planning

The researcher and the classroom teacher collaboratively designed the lesson plans, which included a detailed schedule, instructional materials, assessment tools, and supporting media. Additionally, coordination was carried out with an observer who was responsible for documenting the entire teaching and learning process.

Table 3. Meeting Schedule

No	Date	Meeting	Topic
1	May 8, 2024	Cycle I – Meeting 1	Sides of Plane Figures
2	May 10, 2024	Cycle I – Meeting 2	Angles of Plane Figures
3	May 15, 2024	Cycle II – Meeting 1	Angles of Plane Figures
4	May 17, 2024	Cycle II – Meeting 2	Lines

b. Implementation, Observation, and Evaluation

Cycle I was conducted over two meetings, during which students received instruction using the Problem-Based Learning (PBL) model integrated with the Teaching at the Right Level (TaRL) approach. The student learning activities followed the phases of the PBL model.

The lesson began with preliminary activities, which included preparing the classroom environment and conducting an apperception session to activate students' prior knowledge of statistics in real-life contexts. During this phase, the teacher also briefly explained the upcoming activities related to data presentation and calculating the mean.

The core learning activities included: group discussion using student worksheets (LKPD), presenting results, and conducting evaluations. The main activities followed the steps of the PBL model, while the learning support and grouping strategies were aligned with the TaRL approach.

In the first phase, students were introduced to a problem and guided to analyze the information presented within it.

In the second phase, students were organized into learning groups. These groups were formed homogeneously based on their initial ability levels, categorized into three levels: low, medium, and high. Students worked on the worksheets (LKPD) provided by the teacher according to the given instructions, with each group responsible for solving the problems in the worksheet diligently and collaboratively.

In the third phase, students were guided in solving the problems within their groups. During the discussion process, the teacher moved around the classroom, offering targeted guidance to groups with lower ability levels. For groups with medium and high abilities, the teacher provided support upon request. The researcher also prepared enrichment exercises for those who completed the worksheet before the allocated time.

While circulating, the researcher observed students showing great enthusiasm in solving problems related to data presentation and averages. Group members helped one another and were not hesitant to ask the researcher questions. Some difficulties encountered by the students included selecting and applying appropriate strategies for solving problems related to data presentation and calculating averages. In addition, some students struggled to explain their answers in relation to the given problems and to verify the correctness of their solutions. Group discussions lasted approximately 30 minutes.

The next phase involved presenting problem-solving results. After the group discussions concluded, the researcher invited three groups—representing the low and medium levels—to present their findings in front of the class. The rationale was that if lower-level groups could solve the problems, then groups with higher ability levels should be able to as well.

The final phase consisted of evaluating the problem-solving process. In this phase, students summarized the material they had learned. Before concluding, students were given the opportunity to ask questions about any topics they had not yet understood. Once it was confirmed that no further questions remained, the researcher administered an evaluation consisting of four contextual essay questions aimed at assessing students' mathematical problem-solving abilities.

A comparison of student evaluation scores from Cycle I with the pre-test scores is presented in Table.

Table 4. Comparison of Pre-Test and Cycle I Evaluation Scores

Ability Level	Pre-Test (Frequency)	Cycle I (Frequency)	Average Score	Ability Level	Pre-Test (Frequency)	Cycle I (Frequency)
Low	13	5	42.78	Low	13	5
Medium	3	8	69.57	Medium	3	8
High	0	3	83.90	High	0	3
Total	16	16	189.50	Total		

Although there was an improvement, the majority of students had not yet reached the Minimum Mastery Criteria (MMC). This requires further attention so that students' scores can be improved and more students achieve scores above the MMC. During the closing activity, the researcher also provided an overview of the next lesson topic, which included mode, median, and quartiles. Students were instructed to read the next material as a follow-up to the evaluation results from Cycle I.

c. Reflection

The learning activities in Cycle I were not yet implemented optimally, and several aspects still needed improvement. The researcher identified that the problems in the student worksheet (LKPD) needed to be more detailed and easier for students to understand. Additionally, the researcher needed to design the LKPD problems with better time estimation to accommodate group discussion activities effectively. For Cycle II, student grouping was restructured based on the evaluation results of Cycle I, categorizing students according to their ability levels.

3. Cycle II

a. Planning

In the planning stage of Cycle II, the researcher developed instructional materials, assessment tools, and learning media by reflecting on the outcomes of Cycle I together with the classroom teacher.

b. Implementation, Observation, and Evaluation

Cycle II was carried out over two class meetings. Students were taught using the PBL model integrated with the TaRL approach. The following describes the learning activities based on the Problem-Based Learning model:

The learning process began with preliminary activities, which included classroom conditioning, activating prior knowledge about statistics in everyday life, and briefly introducing the upcoming activities on mode, median, and quartiles.

The core learning activities involved: group discussions using the student worksheet (LKPD), group presentations, and evaluation. The main activities followed the PBL learning steps, while differentiation and student treatment were guided by the TaRL approach.

In the first phase, students were introduced to a problem and asked to analyze the information presented within the problem.

In the second phase, students were organized into homogeneous groups based on similar ability levels, as determined by the evaluation results from Cycle I. The levels were categorized as low, medium, and high. Students worked on the LKPD following the provided instructions. Each group was responsible for solving the problems in the worksheet collaboratively and responsibly.

In the third phase, students were guided through solving the problems as a group. During the discussions, the teacher circulated the classroom and provided intensive assistance to groups with lower ability levels. For the medium and high-ability groups, the teacher offered support as needed. The researcher also prepared additional exercises as enrichment for groups who finished early.

While circulating, the researcher asked students about any difficulties they faced in solving problems related to mode, median, and quartiles. Students appeared enthusiastic in solving the tasks. Group members helped each other and did not hesitate to ask the researcher questions. Difficulties encountered included choosing and applying appropriate strategies to solve problems, explaining answers clearly in relation to the original problem, and verifying the correctness of the solutions. The group discussion lasted approximately 30 minutes.

The next phase involved presenting the problem-solving results. After the group discussions, the researcher invited three groups—representing low and medium ability levels—to present their solutions to the class. The rationale was that if students from lower-level groups could solve the problems, then students from higher levels should be able to do so as well.

One group from the low-ability level presented their solutions to the problems found in the LKPD, while the other groups were invited to respond or correct any mistakes made during the presentation. A group from the high-ability level offered constructive feedback and pointed out calculation errors made by the presenting group.

In the illustration above, a group provided input to the presenting group because of a miscalculation regarding the number of data points in the problem. This feedback group came from the medium ability level. This interaction indicates that students at the medium level had already developed sufficient conceptual understanding and were capable of verifying the correctness of problem solutions.

The final phase involved evaluating the problem-solving process. In this phase, students summarized the material they had learned. They were also given the opportunity to ask questions about any material they had not yet understood. After confirming that there were no more questions, the researcher administered an evaluation consisting of four contextual essay questions aimed at assessing students' mathematical problem-solving abilities.

A comparison between Cycle I evaluation scores and initial test scores is shown in the table below.

Table 5. Comparison of Scores in Cycle II

Ability Level	Pre-Test Score	Number of Students	Cycle II Score	Number of Students
Low	50.13	13	42.78	3
Medium	72.75	3	69.57	8
High	0	0	83.90	5
Total	122.88	16	189.50	16

This indicates that, based on the average score, students' mathematical problem-solving abilities remained low, as the average was still significantly below the Minimum Mastery Criteria (MMC) across all 16 students. This condition calls for attention so that students' performance can be improved, and a greater number of students can achieve scores above the MMC. During the closing activity, the researcher also introduced the next topic—mode, median, and quartiles—and instructed the students to read the material as a follow-up to the evaluation results from Cycle I.

c. Reflection

Cycle II showed a more substantial improvement. The TaRL approach provided students with the opportunity to learn according to their individual ability levels, while the PBL model encouraged interaction and the development of critical thinking skills. It can be concluded that the combination of TaRL and PBL was highly effective in enhancing the mathematical problem-solving abilities of third-grade primary school students.

DISCUSSION

The implementation of the Teaching at the Right Level (TaRL) approach in mathematics learning, particularly in the topic of statistics, proved to be helpful in enabling students to better understand the material and strengthen their thinking skills when solving challenging problems. This approach pays special attention to each student's capabilities and is tailored to their level of understanding. Furthermore, group discussions and problem-based learning activities created a more active and enjoyable learning experience for students.

At the beginning of the activity, the teacher administered a pre-test to assess the students' initial ability in solving mathematical problems. This test was essential to identify the students' competencies and to group them accordingly. This allowed students with lower levels of understanding to receive more focused guidance.

From the pre-test given to 16 students, the following results were obtained:

1. 12 students (75%) were at a low ability level.
2. 4 students (25%) were at a medium ability level.

3. No students were at a high ability level.

These findings indicate that, overall, students' problem-solving skills were still low. Therefore, the teacher continued with instruction using the TaRL approach, carried out over two meetings during Cycle I. Students were divided into three learning groups based on their ability level:

1. Group A: low ability level
2. Group B: medium ability level
3. Group C: high ability level (if applicable)

After engaging in TaRL-based instruction during Cycle I, students were given an evaluation test. The results indicated a notable improvement:

1. 5 students (31%) remained at the low level
2. 7 students (44%) moved to the medium level
3. 4 students (25%) reached the high level

This suggests that the TaRL approach helped students learn in a way that matched their capabilities and encouraged progress to higher levels of achievement. The number of students at the low level decreased, and more students began to understand the material better.

Instruction continued into Cycle II, which also spanned two meetings. Students remained grouped based on the most recent evaluation results. At the end of Cycle II, another test was administered to assess students' final ability levels. The results were as follows:

1. 3 students (18.75%) remained at the low level
2. 8 students (50%) were at the medium level
3. 5 students (31.25%) reached the high level

From this data, it can be concluded that the TaRL approach implemented over two cycles had a highly positive impact on improving students' ability to solve statistical problems. Not only did students better understand the material, but they also became more confident when working in groups and presenting their discussion results.

These findings are in line with the study by Ahyar (2022), which showed that the TaRL approach improved basic literacy skills among elementary students at SDN Inpres Tolotangga. Moreover, in India, the approach has been successfully applied in several regions. For example, in the state of Haryana, the implementation of TaRL in 200 schools led to an increase from 34% to 53% of students who could read paragraphs and simple stories. In Bihar and Maharashtra, student reading proficiency rose significantly from 15% to 48% in just 50 days of the program.

Thus, the use of the TaRL approach is highly relevant and appropriate for primary education, including in third-grade classrooms, as it enables students to learn according to their individual needs and strengthens their abilities to understand and solve mathematical problems both independently and collaboratively.

4. CONCLUSION

Based on the data analysis from the classroom action research conducted, it can be concluded that the Teaching at the Right Level (TaRL) approach is effective in enhancing the mathematical problem-solving abilities of third-grade primary school students. This approach allows each student to learn in accordance with their ability level, thereby increasing their confidence and reducing the burden of understanding mathematics, especially in the topic of statistics.

By grouping students according to their abilities and focusing learning activities on conceptual understanding and problem-solving practice, students became more active in discussions, developed their own strategies, and collaborated effectively in groups. This process fostered the development of logical thinking and independent problem-solving skills.

The results of implementing the TaRL approach clearly show improvements in students' understanding and ability to solve statistical problems. Therefore, this study highlights the importance for teachers to adopt flexible and differentiated instructional strategies that cater to the diverse needs and abilities of students in the classroom, so that the goals of mathematics education can be achieved more effectively.

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