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Improving Student Learning Outcomes on Matrices Through the Teaching at The Right Level (TaRL) Approach

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ABSTRACT

This study is a classroom action researchaimed at obtaining a description of the improvement in learning outcomes of grade XI students at Palu State Senior High School 1 through the application of theTeaching at the Right Level (TaRL) learning approach to matrix material. The research was conducted in the even semester of the 2024/2025 academic year with 37students as subjects. This research was conducted in two cycles, each consisting of four stages, namely planning, action, observation, and reflection. Data were obtained through observation, interviews, learning outcome tests, anddocumentation. The results showed that the application of the TaRL approach couldsignificantly improve student learning outcomes. Learning completeness increased from 40.54% in the pre-cycle to 56.76% in cycle I, andreached 81.08% in cycle II. In addition, the activity, motivation, and collaboration of students also increased during the learning process. Thus, theTaRL approach is effective in increasing student engagement and learning outcomes in matrix material.

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INTRODUCTION

Education plays an important role in shaping human resources who are qualified, adaptive, and have the ability to think critically. Law Number 20 of 2003 concerning the National Education System emphasizes that education aims to develop the potential of students to become human beings who have faith, piety, noble character, capable, creative, independent, and become democratic and responsible citizens. In this context, learning in schools not only aims to transfer knowledge, but also to form the logical thinking and problem-solving skills needed in real life.

Mathematics is one of the subjects that plays a strategic role in developing logical, analytical, and systematic thinking skills. However, the reality is that there are still many students who have difficulty understanding abstract mathematical concepts, including matrix material. This material requires the ability to understand symbols, operations, and relationships between elements that are quite complex. The results of the initial observation in Class XI Mipa 3 SMA Negeri 1 Palu showed that only 15 out of 37 students (40.54%) achieved a score above the Minimum Completeness Criteria (KKM = 80). This condition shows that there are still many students who do not understand the basic concept of matrices

well. The main causative factor is the learning approach that is still conventional and teacher-centered, so that students play a passive role.

To overcome these problems, adaptive learning strategies that are responsive to the needs of students are needed. One relevant approach is *Teaching at the Right Level* (TaRL), which is an approach that focuses on teaching according to the level of mastery of students, not solely based on age or class. This approach was first developed by the Pratham Institute in India and has been shown to improve learning outcomes in various educational contexts (Banerjee et al., 2022). Through diagnostic assessments, teachers can map students' initial abilities and provide learning that suits the needs of each ability group. Thus, low-ability students get reinforcement of concepts, while high-ability students get deeper challenges.

The implementation of TaRL is in line with the principle of differentiated learning in the Independent Curriculum which emphasizes the importance of learning according to the readiness, interests, and learning profile of students. Previous studies (Putri, Prayito, & Miftakhul, 2023; Dewantari & Nuris, 2025) show that the TaRL approach not only improves learning outcomes, but also builds confidence and active involvement in the learning process. Based on this background, this study aims to describe the improvement of learning outcomes of grade XI students of SMA Negeri 1 Palu in matrix material through the application of *the Teaching at the Right Level approach.*

RESEARCH METHODS

This type of research is Classroom Action Research (PTK), with a qualitative and quantitative approach (*mixed method*). The research design refers to the spiral model of Kemmis and McTaggart, which consists of four stages, namely:

1. PlanningThe researcher prepares an action plan in the form of learning tools such as teaching modules, teaching materials, learning media, and Student Worksheets (LKPD) that are adjusted to the principles of TaRL. Researchers also conduct diagnostic assessments to identify students' initial abilities, then group them into three levels of ability: basic, intermediate, and advanced.
2. Implementation of ActingLearning activities are carried out in accordance with the plan that has been prepared. Teachers carry out introductory, core, and closing activities according to active learning steps based on ability differentiation.
3. ObservingObservation is carried out by researchers and peers to monitor teacher involvement and student activities during the learning process.
4. Reflection is carried out at the end of each cycle to analyze the results obtained, identify obstacles, and formulate improvement strategies for the next cycle.

The research was carried out at SMA Negeri 1 Palu in the even semester of the 2024/2025 academic year with 37 students in class XI MIPA 3 (13 males and 24 females). Data collection techniques include observation, interviews, learning outcome tests, and documentation. Observation was used to monitor the activities of teachers and students during learning, interviews were used to determine students' responses to the implementation of TaRL, while learning outcome tests were used to measure the improvement of mastery of matrix material concepts.

Data analysis was carried out qualitatively and quantitatively. The qualitative analysis uses the Miles and Huberman model (in Sugiyono, 2019) which includes data reduction, data presentation, and conclusion drawn. Quantitative analysis was carried out by calculating the

average score, percentage of learning completion, and improvement in learning outcomes between cycles. The success criteria are set if at least 75% of students achieve a score of ≥ 80 and the learning activities are in the good or very good category.

RESULTS AND DISCUSSION

Before the action was taken, the learning process in class XI MIPA 3 at SMA Negeri 1 Palu was still conventional. Teachers dominate the learning process, while students tend to be passive. The results of the pre-cycle test showed that only 15 out of 37 students (40.54%) achieved grades above the KKM. This condition is the basis for the implementation of class actions by applying the Teaching at the Right Level approach.

Cycle I was carried out in two meetings. Before implementation, researchers and teachers prepared learning tools in the form of teaching modules, LKPD, and diagnostic assessments to identify students' initial abilities. Based on the results of the assessment, students are divided into three groups: basic, intermediate, and advanced. At the action stage, the teacher provides learning that is tailored to the level of ability of each group. The basic group is focused on strengthening basic matrix concepts such as addition and subtraction, the intermediate group on matrix multiplication operations, while the advanced group is given contextual problems and advanced problem-solving.

The results of the final test of the first cycle showed an increase in learning completeness to 56.76%. Although the increase has not been significant, students' learning activities show positive developments. Students began to actively participate in group discussions, but there were still some who depended on their group friends. The teacher noted that the learning time was still not optimal and some students from the basic group needed more intensive assistance.

Based on the results of reflection, in cycle II, improvements were made in the form of the application of the peer tutoring method. Students from intermediate and advanced groups help the basic group understand concepts through collaborative discussions. Teachers provide additional motivation and utilize visual media to help students understand matrix operations in a concrete way. The results of the second cycle test showed a significant increase, with 30 out of 37 students (81.08%) achieving scores above the KKM. In addition to improving learning outcomes, students' activities and enthusiasm also increased. They are more active in asking questions, discussing, and being able to explain the steps of completion to classmates.

Qualitatively, the TaRL approach creates a more fun and collaborative learning atmosphere. Students feel more confident because they get material according to their ability level. Teachers also find it helpful because they can monitor the progress of each group more effectively. This is in line with the findings of Asrini et al. (2023) that the application of TaRL in mathematics learning can increase students' active involvement and reduce the ability gap in the classroom.

The results of the study show that the application of *the Teaching at the Right Level* (TaRL) approach is able to improve learning outcomes and student participation. The increase in the percentage of completeness from 40.54% in the pre-cycle to 81.08% in the second cycle shows that this approach is effective in addressing the learning ability gap. The TaRL approach acts as a form of learning differentiation that facilitates diverse learning needs, as explained by Slavin (2019) that learning that adjusts to students' ability levels tends to increase academic outcomes and intrinsic motivation. The implementation of TaRL is also in line with the principles of the Independent Curriculum which emphasizes differentiated and student-centered learning.

This study strengthens the findings of Dewantari & Nuris (2025) who stated that TaRL is effective in improving learning outcomes through grouping based on students' actual

abilities. In addition to improving cognitive outcomes, this study also showed positive changes in affective and social aspects, such as increased confidence, responsibility, and cooperation between students. This shows that TaRL not only affects academic achievement, but also plays a role in shaping students' character and social skills.

CONCLUSION

Based on the results of the class action research carried out in two cycles on grade XI students of SMA Negeri 1 Palu, the following conclusions were obtained:

1. The application of *the Teaching at the Right Level* (TaRL) approach has proven to be effective in improving student learning outcomes in matrix materials. Learning completeness increased from 40.54% in the pre-cycle to 56.76% in the first cycle, and reached 81.08% in the second cycle.
2. Students' activities, motivation, and involvement increased significantly, characterized by activeness in discussions, group cooperation, and the ability to solve problems independently.
3. The TaRL approach facilitates differentiated learning that adapts learning activities to the level of ability of students, so that the learning process becomes more meaningful, interactive, and collaborative.
4. Teachers can use this approach as an alternative learning strategy that is oriented to the needs of students in applying the principles of the Independent Curriculum.

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