Auditory intellectually repetition learning model and trade a problem learning model on row and series algebraic material: The influences on numerical skills

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Abstract. Mathematics learning is dealing with numerical skills. One way to improve numerical skills is to use appropriate learning models. This study aimed to determine the influence of the Auditory Intellectually Repetition learning model and the Trade A Problem learning model on numerical skills on row and series of algebra. This research was a quasi-experimental research. Hypothesis testing employed a t-test with a significance level of 5%. The test results revealed that the Auditory Intellectually Repetition learning model and the Trade A Problem provided different influences. Based on the results of the study, it can be concluded that the Auditory Intellectually Repetition learning model had a better influence on increasing numerical skills in row and series compared to the Trade A Problem learning model.

Keyword: Algebra, Auditory Intellectually Repetition Learning Model, Numerical skills, Trade A Problem Learning Model, Row.

1. Introduction

Students’ mathematics achievement level is relatively low and far from expectations [1]. One of the aspects needed to improve mathematics learning achievement is numerical skills. Numerical skills are useful and very important in solving mathematical problems. According to the previous research, the numerical skills have been researched with several learning models, including Pair Check, Contextual, Group Investigation, Talking Stick, Think-Pair-Share (TPS), Realistic Mathematics, After Project, Learning Cell, Inquiry, and STAD [2,3,12–19, 4–11]. Students’ numerical skills can be improved by using appropriate learning models including the AIR model and the TAP model.

Auditory Intellectually Repetition (AIR) learning model can make students learn by listening, reasoning, and then repeating the learning materials to deepen their understanding of questions [20]. Previous research has applied the AIR learning model on mathematical communication skills, problem-solving, learning achievement, conceptual understanding, mathematical understanding, cognitive learning outcomes, learning outcomes, motivation and learning outcomes, understanding mathematical concepts, mathematical problem-solving, reasoning, mathematical understanding, and creative-thinking [20,21,30–35, 22–29].

The Trade A Problem (TAP) learning model is a cooperative learning model that repeats the lessons and invites students to take an active role in learning [36]. Previous researchers have applied the TAP
model on various skills, including mathematical communication skills, problem-solving, and learning outcomes [36–39]. Based on the previous research, there have been no researchers who focused their research on the influence analysis of AIR and TAP learning models on numerical skills. The purpose of this research was to compare the influence of the Auditory Intellectually Repetition (AIR) learning model and the Trade A Problem (TAP) learning model on numerical skills.

2. Research Method
This research employed the quantitative approach with a quasi-experimental design. The learning models applied in this research are presented in Figures 1 and 2.

![Figure 1. The Steps of Auditory Intellectually Repetition Learning Model](image1)

![Figure 2. The Steps of Trade A Problem Learning Model](image2)

Based on Figures 1 and 2, it can be seen that the learning models applied were the Auditory Intellectually Repetition learning model and the Trade A Problem learning model. The steps of the Auditory Intellectually Repetition learning model consisted of the preparation stage, the auditory stage, the intellectual stage, and the stage repetition. The steps of the TAP learning model consisted of group division, explanation of material by teachers, distribution of questions, exchange of questions between groups, problem-solving, presentation of answers by students, question and answer, and work on practice questions. The data was collected through the post-test results and then analyzed by performing the t-test to see the influences of the AIR and TAP learning models on students’ numerical skills.

3. Results and Discussion
The AIR and TAP learning models had been implemented in each class to see their influences on students’ numerical skills. The data obtained are presented in Table 1.
Table 1. The Descriptive Test Results of Numerical Skills Test

| Model | N  | Mean   | Standard Deviation | Std. Error Mean | Minimum | Maximum |
|-------|----|--------|-------------------|-----------------|---------|---------|
| AIR   | 30 | 90.2667| 9.55179           | 40.00           | 60.00   | 100.00  |
| TAP   | 30 | 86.7000| 8.38369           | 39.00           | 58.00   | 97.00   |

Based on Table 1, the data on the implementation of AIR and TAP learning models on 30 respondents can be seen. In terms of concentration, the AIR model had more influence on numerical skills. It can be seen from the mean and maximum values which indicated that the AIR learning model produced greater values than the TAP learning model. To strengthen this argument, the researchers proceed with the t-test as can be seen in Table 2.

Table 2. Independent Samples t-Test

|                      | Levene’s Test for Equality of Variances | t-test for Equality of Means |
|----------------------|----------------------------------------|-----------------------------|
|                      | F          | Sig | T         | Df | p-value |
| Numerical Skills     | Equal variances assumed | .142 | .707 | 1,537 | 58 | .013 |
|                      | Equal variances notes assumed | 1,537 | 57 040 | .013 |

Based on Table 2, It can be seen that the p-value was 0.013 <0.05, so it can be concluded that H₀ was rejected and H₁ was accepted. It can be said that the AIR learning model and the TAP learning model had different influences on increasing students’ numerical skills. Hypothetically and statistically, the AIR learning model provided a better influence.

The comparison results showed that the AIR learning model produced a better result than the TAP learning model. There were differences in the steps of each learning model. The first step of the AIR learning model was preparation while the first step of the TAP learning model was group division. The second step of the AIR learning model was the delivery of material to make students understand the problems to be discussed while the second step of the TAP learning model was the material delivery by teachers. The third step of the AIR learning model was doing exercise and discussing a problem so that students can play an active role in responding and solving a problem while the third step of the TAP learning model was the distribution of questions to students. The step that made the AIR learning model different from the TAP learning model was the repetition of the material after the presentation of the discussion results about a problem so that students can easily understand the material.

Based on the difference, the AIR learning model showed a better influence than the TAP learning model on students’ numerical skills. This influence was in line with research that has been conducted that the AIR learning model is better in increasing numerical skills. Besides improving the numerical skills, the AIR learning model can also improve understanding of mathematical concepts, motivation, learning outcomes, and problem-solving [27,29,40]. The TAP learning model can also improve numerical skills. Besides improving the numerical skills, according to previous research by [36,37] the TAP learning model can also improve mathematical communication skills and mathematical problem-solving. However, in this research, the AIR learning model provided a better influence than the TAP learning model in improving students’ numerical skills on line and series algebraic material. The novelty of this research lied in the influence of the AIR and TAP learning models on students’ numerical skills in line and series algebraic material.
4. Conclusions and Suggestions

Based on the results of the analysis, it can be concluded that the AIR model was more influential and provided an improvement in students’ numerical skills in series and line algebraic material compared to the TAP learning model. Based on the research, the researcher expected that further researchers to investigate the implementation of the AIR and TAP learning models in improving other skills.

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