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Application of The Arias Learning Model to Improve Mathematical Thinking Ability

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Abstract

The aim of this research is to improve students' mathematical thinking skills on social arithmetic material through the ARIAS learning model for class VII students in the even semester of the 2023/2024 academic year. This research method is classroom action research which follows the Kemmis and Taggart model. This research includes 3 cycles where each cycle includes 4 stages, namely planning, azcting (action), observing (Observation), reflecting (Reflection). In cycle I the student evaluation results averaged 59.37 with a completion percentage of 26%, in cycle II there was an increase in student evaluation results with an average of 72.70 with a completion percentage of 67% and in cycle III there was an increase with an average of 80 .83 with 96% completion. Based on the results of this research, it can be concluded that learning using the ARIAS learning model can improve students' mathematical thinking abilities.

Keywords: Ability, learning ARIAS, mathematical thinking ability, thinking ability.

1 INTRODUCTION

In today's advanced, modern and sophisticated life, education plays an important role in ensuring survival. Education is a vehicle for improving and developing the quality of human resources. Through the provision of education, it is hoped that it can produce quality people who will support the achievement of national development targets.

The National Education System functions to develop abilities and shape the character and civilization of the nation with the aim of developing the potential of students to become quality human beings with the characteristics of faith and devotion to God Almighty, noble character, healthy, devout, capable, creative, independent, and become democratic and responsible citizens (UU RI No 20 Tahun 2003).

The conventional learning model is a learning model where the teacher plays the main role in determining the content and steps in delivering material to students. So that students' activeness in participating in learning and teaching activities is reduced and they only depend on the teacher. This learning model revolves around giving lectures, questions and answers, discussions and assignments. As a result, when studying mathematics material, students tend to lack enthusiasm and it is considered a boring lesson.

Provides a definition of a learning model as a conceptual framework that describes procedures for organizing learning experiences to achieve learning goals (Suprihatiningrum, Jamil. 2015). The learning model functions as a guide for teachers in planning and implementing learning activities. defines a learning model as a conceptual framework that describes systematic procedures for organizing learning experiences to achieve certain

learning goals. The learning model functions as a guide for learning designers and teachers in planning and implementing teaching and learning activities (Winataputra. 2014).

The ARIAS learning model is a learning model developed by Djamaah Sopah from the ARCS (Attention, Relevance, Confidence, Satisfaction) learning model with several forms of modification. The ARCS learning model or Attention, Relevance, Confidence, Satisfaction is a learning model developed by John M. Keller in 1987. The development of this learning model carried out by Djamaah Sopah is a method used to design learning activities that can influence achievement motivation and results. student learning. Learning model ARIAS memiliki lima komponen utama yaitu Assurance (percaya diri), Relevance (sesuai dengan kehidupan sekitar siswa), Interest (menarik minat dan perhatian siswa), Assessment (evaluasi), Satisfaction atau penguatan. Lima komponen utama model pembelajaran ini merupakan sintaks dalam model pembelajaran ARIAS (Suryati, 2013).

Mathematics is "Mathematical thinking is a dynamic process which, by enabling us to increase the complexity of ideas we can handle, expands our understanding". This means that mathematical thinking is a dynamic process that allows us to increase the complexity of the ideas we want and expand our understanding. Mason and Stacey also added that there are four stages that go through mathematical thinking, namely specialization, generalization, guessing and belief (Mason, J., Burton, L., & Stacey K. 2014). Mathematical thinking is a thinking ability related to the ability to use reasoning to build mathematical arguments, the ability to develop strategies or methods, understanding mathematical content, and the ability to communicate ideas. The ability to think mathematically needs to be placed as a learning goal and at the same time as a way to learn mathematics. (Ariyadi Wijaya. 2015).

Honing critical thinking skills will help them recognize their own potential and become trained in dealing with various problems (Rizti & Prihatnani, 2021; Diva & Purwaningrum, 2023). The ability to think creatively mathematically is an ability that students must have. Mathematical creative thinking ability means an individual's ability to think with the aim of finding new, different ideas to create new, unusual, original ideas that bring definite and precise results (Andiyana et al., 2018). The importance of creative mathematical thinking skills is to teach students more complex and critical thinking processes in solving mathematical problems. Students learn to link the knowledge they already have by looking at problems from a broader or different perspective (Ratna Widianti Utami et al., 2020)

Classes that have problems have low class average learning outcomes in mathematics subjects. The low mathematics learning outcomes can be seen from the mid-semester assessment data of students who obtained an average standard score on the Minimum Completeness Criteria (KKM) standard, namely 70 out of 24 students achieved the KKM standard score. Only 35.71% of students got scores above the KKM, while the other 64.29% got standard KKM scores. The results obtained in learning can be said to be successful if students achieve a KKM score with a presentation of ≥ 85% of the total number of students in one class. The aim of this research is to determine whether the application of the ARIAS learning model can improve students' mathematical thinking skills in Social Arithmetic material.

2 RESEARCH METHODS

This research uses a qualitative method with a classroom research approach (classroom Action Research) with a central emphasis through the application of the ARIAS learning model which can improve students' mathematical thinking skills in social arithmetic material. This classroom action research was carried out in 3 cycles, the results of the actions in each cycle were analyzed so that based on this analysis it could be determined whether the next cycle

could be continued or not. In this classroom action research, there are four stages that are commonly passed, namely Planning, Action, Observation, and Reflection.

3 FINDINGS AND RESEARCH RESULTS

This classroom action research (PTK) was carried out in class VII MTs Al Islamiyyah Tangerang City for 1 month, starting from April 26 2024 to May 27 2024. This research was carried out with the aim of improving students' mathematical thinking skills using the ARIAS model. This research was carried out in 3 cycles, each cycle consisting of 4 meetings. The stages of this research include planning, implementation, observation and reflection stages. From the results of the mathematical thinking ability test of students who met all the indicators of students' mathematical thinking ability in this pre-action, only 2 students out of 24 were recorded with a percentage of 8% with an average score of 42.70, this is far below the set KKM value of 70.00.

3.1 Cycle I

The author conducted interviews with key informants to find out a general picture of students' attitudes and behavior regarding understanding the concept and types of social arithmetic. The interview results show that there are still many students who do not know about social arithmetic. They do not understand the concept and types of social arithmetic. Based on field notes during teaching and learning activities, there were some students who did not pay attention to the lessons delivered by the teacher and others, although the students paid attention to what the teacher said, their understanding of the material was still low.

The evaluation results in cycle I showed that the level of success or completeness of students had increased understanding compared to before the Pre-cycle, although it was still low, namely the success rate was 29% with an average score of 59.37. In implementing learning in cycle II there must be changes and improvements to achieve maximum levels of success. 1) Judging from the evaluation scores obtained in cycle I, none of the students got good scores (90 - 100), while 7 students (29%) got fair scores (70-89) and those who got poor scores (0-69) were as many as 17 students (71%). 2) Meanwhile, judging from the activeness of students in teaching and learning activities (asking questions and conveying their ideas) there were 10 students out of 24 students. During the learning period, it was found that students had not been able to absorb the lessons that had been delivered due to their lack of focus and ability to absorb different lessons, so a more varied learning model was needed.

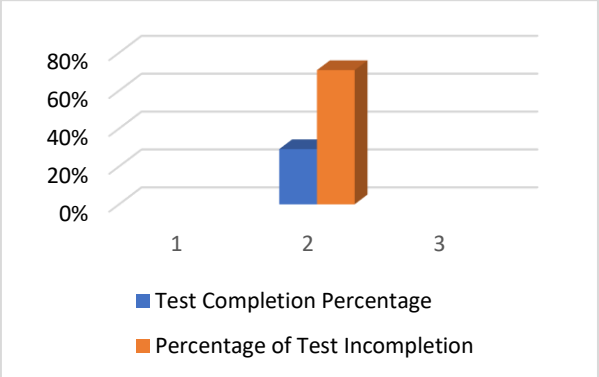


Figure 1.

3.2 Cycle II

Based on field notes, during group learning, each student appeared to be active in their respective groups whose members had been changed. The researcher's intention was that researchers could find out to what extent the students' abilities were in understanding the material provided by the teacher. As for observations outside the teaching and learning process, the teacher has also expressed interest and conveyed the learning objectives. In this cycle the level of student activity has increased, this can be seen from the students' courage in conveying ideas and questions about the material which has increased compared to the original writing cycle. 1) Judging from the test results, it can be concluded that in the Mathematics lesson discussed in cycle II, there were 16 students (33.34%) who got adequate scores (70-89), and 8 students who got poor scores (0-62). students (66.77%) Judging from the students' activeness in recording the lesson material presented by the teacher and the summary results of teaching and learning activities, all of them were active. Although there are still some students who do not understand the lesson material well.

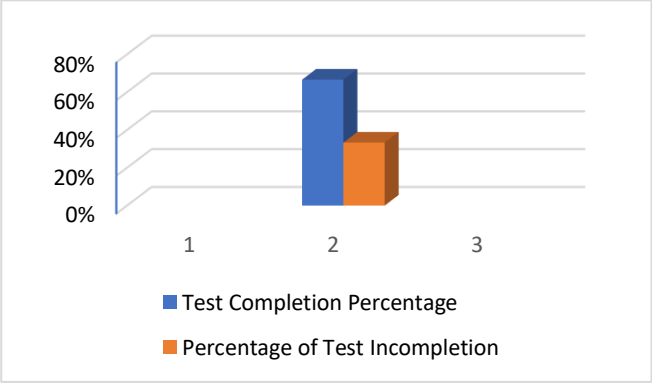
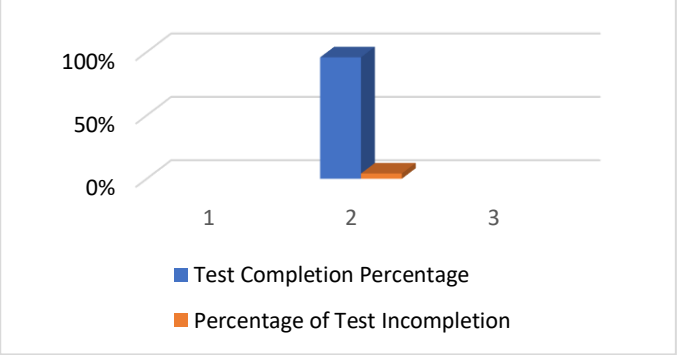


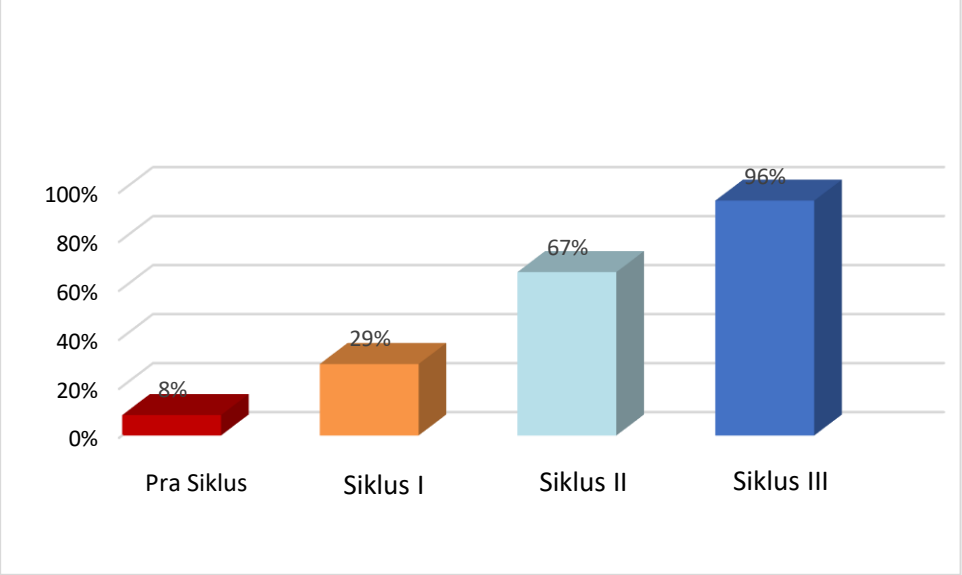
Figure 2.

3.3 Cycle III

Based on the observer's observations in cycle III learning activities, all groups were active in solving problems or structured tasks. Students learn to become more active and enthusiastic and gain more self-confidence, this can be seen from the students' efforts to be active in answering the questions that have been given.



Grafik 3.



Grafik 4.

Graph 3.4 data recapitulation of test results that have been carried out in cycles I to III can be said to have improved, this can be seen from the results of the average class score which is getting better, namely 84.67 in cycle III, although in cycle III the lowest score was still 70.00. said to be quite good considering the KKM grade score is 70.00.

4 CONCLUSION

Data on the action process carried out in Cycles I to Cycle III shows an increase in student abilities and the teaching and learning process using the ARIAS learning model. The use of the ARIAS learning model is a way for a teacher to carry out teaching and learning activities to always use an effective approach in order to stimulate students' attention and motivation to improve students' good mathematical thinking abilities.

From the test results, observations and questionnaires made, it can be concluded as follows: a) The results of observing student activities in mathematics learning in Cycle I amounted to 35%, Cycle II amounted to 70%, Cycle III amounted to 100%. b) The average results of the student test classes per cycle are as follows: 1) Cycle I totaled 59.37 (8%), 2) Cycle II totaled 72.70 (29%), 3) Cycle III totaled 80.83 (96 %).

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