

Can Co-op Type Cooperative Learning Improve Students' Mathematical Generalization Ability?

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Abstract

The purpose of this study is an effort to improve mathematical generalization abilities and student learning outcomes in the material of arithmetic sequences and series using the cooperative learning model of the Co-op Co-op type of class X accounting students at Teratai Putih Global 2 Bekasi Vocational School. Academic year 2022/2023. The research method is classroom action research using the co-op co-op cooperative method. This research includes 3 cycles where each cycle includes 4 stages namely planning (planning), acting (implementation), observing (observation), reflecting (reflection). The time of this research was 2 months from August 2022 to September 2022 with 14 research subjects, while data was collected through tests, interviews and observation. The results of the research showed that there was an increase in mathematics learning outcomes in class X students. This was evidenced by the average results of the mathematics test in each cycle increased, namely in cycle 1 = 60.714, cycle 2 = 66.428, and cycle 3 = 72.857. The results of the interviews conducted concluded that learning mathematics on arithmetic sequences and series using the cooperative co-op co-op method is fun for students. This study concludes that learning mathematics using the cooperative co-op co-op method can improve students' mathematical generalization abilities and mathematics learning outcomes.

Keywords: Arithmetic sequences and series, Co-op co-op type cooperative, Mathematical generalization ability.

1 INTRODUCTION

Based on the sources that I researched by observing and interviewing class X accounting students at Teratai Putih Global 2 Bekasi Vocational School, the interest in learning mathematics is very low, this is evidenced by the results of the student's daily assessment tests, there are still many students who score below the KKM, only 5 out of 14 students. as well as from seeing the teaching and learning process in class there are still many students who do not understand the material after being explained by the teacher, students always ask and ask the teacher to explain again and again, especially in mathematical materials that use logic or reason and learning which is always teacher-centered results in a lack of play the role of the child in solving the problems given.

With the cooperative learning model of the Co-op co-op type, researchers feel that this learning model is suitable because it is oriented towards learning tasks and students control what and how to learn the material that should be assigned to them. One of the materials that are part of mathematics is sequences and series. Sequences and series are one of the materials in mathematics lessons in class X. One of the competencies expected in learning this material is that students are able to apply concepts and generalize number patterns to sequences and series. This material is also material that often appears in national exam questions and college entrance exams. Therefore, students' mathematical generalization skills are needed to understand sequences and series.

Based on the background of the problems above, the authors feel interested in conducting research with the title "Efforts to Improve Mathematical Generalization Ability of Arithmetic Sequences and Series Materials Through Co-op Co-op Cooperative Learning Models in Class X Accounting Students of SMK Teratai Putih Global 2 Bekasi.

2 RESEARCH METHODS

This research uses Classroom Action Research, which is a form of research that is reflective by taking certain actions in order to improve and improve classroom learning practices in a more professional manner. The research model used is in the form of a cycle which refers to the Kemmis and Mc. The models and explanations for each stage are in Figure 1.

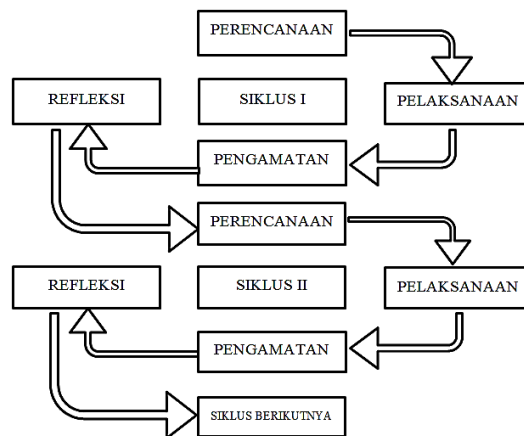


Figure 1. Kemmis and Mc Taggart Model Cycle Chart

3 RESULT AND DISCUSSION

This research was conducted from August to September 2022. Each cycle consists of several cycles stages that is: planning, implementation, observation And reflection. Before do study researchers and collaborators discuss to prepare Learning Device Plans (RPP) with using the co-op co-op cooperative learning method , observation sheets and final tests are carried out at the end of each cycle. Researchers assisted by collaborators observing every course of the learning process for see activity student in solve problem mathematics And know development the learning process and the influence of the cooperative learning model of the co-op co-op type can be improve students' mathematical generalization. Based on the implementation of the actions taken for 3 cycles, the data is obtained that the mathematical generalization ability of students with cooperative learning methods co-op co-op type increased. The results of observations made by researchers and collaborators can be seen in Figure 2.

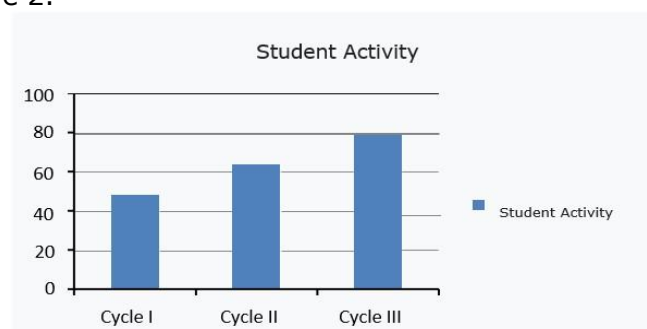


Figure 2. Student Activity

Activity student on cycle III experience enhancement compared to with cycle II And reach indicator study Which more Good. This can be seen from the results of student observations which increased from 64% in cycle II to 80% in cycle III. Cycle III there was an increase by 16% of the cycle II. This increase can be seen in the graph above.

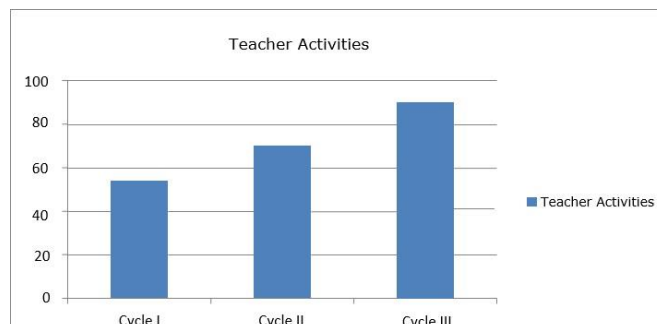


Figure 3. Activity Teacher

On process learning cycle III, activity Teacher increase in where make activity student Also increase. Student will more enthusiastic and more active in learning and students always try to understand What Which studied. Student Also Already start feel learning Which Serious but pleasant. They very enthusiastic in cooperative learning type Co-op co-op. Students are bolder and more confident. All students easily understand the questions well And able to use the results of generalizations to solve problems, and students have been able to apply the rules or patterns of problems.. This is what make the results of increasing students' mathematical generalization ability in cycle III has increased compared to the results in cycle II with the average value of 71.75 in cycle II becomes 79 in cycle III. This can be seen in Figure 4.

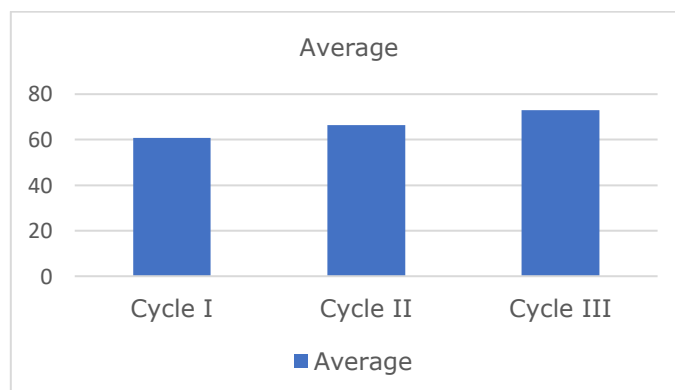


Figure 4. Average Results Test End Student

Based on the results of the questionnaire that has been filled out by students it can be concluded that the Co-op Co-op Cooperative learning model is in great demand and liked by students, especially students of class X SMK K Global White Lotus 2 Cities Bekasi. Results questionnaire students can be seen in Table 1.

Based on findings, it is said that the overall results of learning and generalization of mathematics skills of class X students during learning process increased with each cycle. As in the findings in cycle II, in this cycle students capable know something rule or pattern And capable identify it, and students are able to use the results pattern identification to determine the next structure or data, if related to the theory in chapter II this is already at the stage (perception of generality and expression of generality) where this can be proven in the test results in cycle II which have increased from before in cycle I.

Table 1. Questionnaire table

| Statements | Answer (%) | |
|---|------------|--------|
| | S | TS |
| 1. Learning by using cooperative co-op method co-op make I like Study mathematics | 78.571 | 21.429 |
| 2. Learning with use method cooperative co-op co-op make I easy understand material | 71.429 | 28.571 |
| 3. Co-op co-op cooperative method learning got me can know rule pattern And capable identify it on material line And row arithmetic | 85.714 | 14.286 |
| 4. With method cooperative co-op co-op This make I bored follow learning | 14.286 | 85.714 |
| 5. Ability generalization mathematical I become increase with cooperative method co-op co-op type | 7.143 | 92.857 |
| 6. With method learning cooperative co-op co-op, I become more Lots get experience Study | 92.857 | 7.143 |
| 7. I feel atmosphere class become chaotic with application method learning cooperative type co-op co-op This | 14.286 | 85.714 |
| 8. Method learning cooperative co-op co-op This make I more Can value difference opinion | 100 | - |

Note: A= Agree, DA= Disagree.

According to the results of the interviews, students were more enthusiastic in learning with cooperative learning model Co-op co-op, students can develop ability learn mathematics Good in a manner individual nor group. Co-op co-op cooperative learning model is very helpful student in finish problem. Matter This even proven from results interviews which stated that the Co-op cooperative learning model co-op very help For each other exchange opinion in finish which problem faced.

Application model Learning group No is matter Which new for student class X SMK Lotus White Global 2 Bekasi. Based on the observation results, Co-op co-op cooperative learning model more interesting for students, especially when sent as a group and students are expected to present results in other groups. Student seen more active, enthusiastic, And enthusiastic in Study.

During the process of learning mathematics in class X through models learning cooperative Co-op co-op show exists enhancement on results Study and improvements in mathematical generalization abilities student on every cycle, Good seen overall. This increase was due to the harmony and enthusiasm of the students on the learning done. Improved capabilities and results learning mathematics of class X students can be seen from the increase in the average value test average at the end of each cycle. The average value of students' mathematics learning outcomes at cycle I of 60.714 in cycle II increased to 66 , 426 and on cycle III increased to 72,857.

Based on results test every cycle, amount student Which reach KKM experienced increase. In cycle I only 2 people reached mark KKM 21.428 % from amount student. On cycle II increases become 7 students or 50 % of amount student. On cycle III increase become 12 students or 85.714 % of amount student.

Based on these results it can be concluded that Ability Generalization and mathematics learning outcomes of class X students of White Lotus Vocational High School Global 2 Bekasi experience enhancement. Mark average results Study students' mathematics on arithmetic sequences and series material in class X on cycle III has reached the KKM and the number of students who have more scores of 75 already reached the target ie 85.714 % of the number of students. So got it is said that with the cooperative learning model Co-op co-op in an effort to improve the generalization ability of mathematics and students' mathematics learning outcomes in the material for sequences and row arithmetic experience success in its application in this research.

To prove that the cooperative learning model of the co-op co-op type is capable of improving mathematical generalization abilities or learning outcomes I quote from the

results of previous research with the title "Improving Advanced Calculus Problem Solving Ability through the Co-Op Co-Op Learning Model". ' by using the same learning model and seeing the results and conclusions have also increased in cycle readiness.

4 CONCLUSION

Based on research on the use of Co-op type cooperative learning models co-op in learning mathematics to improve generalization abilities and students' mathematics learning outcomes in the material of arithmetic sequences and series, it can be concluded that the co-op model co-op can improve mathematical generalization abilities and students' mathematics learning outcomes in the material of arithmetic sequences and series in class X SMK Teratai Putih Global 2 Bekasi. This statement is based on the results of the final test given in each cycle. The average final test score in cycle I was 60.714, in the final test in cycle II it increased to 66.428 and in the final test in cycle III it increased to 72.857. Then the number of students who achieved the KKM score and exceeded the KKM score also increased. In the first cycle there were 21.428% of students, in the second cycle it increased to 50% and in the third cycle it increased to 85.714%.

Based on the conclusions made, what happened in this study was that the ability to generalize mathematics and students' mathematics learning outcomes in the material for arithmetic sequences and series increased due to the application of the Co-op type cooperative learning model Co-op in mathematics learning that familiarizes students with solving problems. In addition, the learning steps must be carried out effectively and efficiently so that the learning objectives can be achieved optimally.

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