Application of model cooperative learning type numbered head together can improve the achievement of learning mathematics materials KPK and FPB students

Umu Fadilah
SDN PANGKATREJO II
Email: umufadilah68@gmail.com

Abstract

The problem in this research is how to improve student learning achievement in FPB and KPK materials with the implementation of the NHT model cooperative learning model in grade 4 students of SDN Pangkatrejo II Year 2018/2019?
This research was conducted at SDN Pangkatrejo II, where researchers teach. The subjects of the study were grade IV students to 18 students. In this research, planning, learning strategies are determined using peer tutor methods , which are then designed based on the flow of cycles (cycle I, cycle II), each of which uses four stages.
Learning with the NHT method on KPK and FPB material has a positive impact in improving student learning achievement, which is characterized by increasing student learning completeness every cycle, namely, cycle I 66.7%to 83.3%in cycle II. The application of the NHT method in KPK and FPB subject matter has a positive influence, which is to improve students' skills in solving problems related to KPK and FPB shown by the increasing number of children who can do problems about KPK and FPB well.

Keywords: NHT, achievement, FPB, and KPK

Introduction

Learning is the process of changing an individual's behavior as a result of his experience in interacting with the environment. Learning is not just memorization, but a mental process that occurs in a person. The change was relatively constant and scarred (Sardiman A.M, 2004:20.) In this regard, the learning process and changes are evidence of the results processed. Learning not only learns lessons but also drafting, habits, perceptions, pleasures or interests, social adjustments, an assortment of other skills and ideas. Thus, a person is said to learn when there is a change in him due to exercise and experience through interaction with the environment.

To be able to understand the learning process that occurs in students, and need to master the nature and basic concepts of learning, the Law No. 20 of 2003 article 1 paragraph 1 of the National Education System explains that: "Education is a conscious and planned effort to realize the atmosphere of learning and learning process so that students actively develop their potential to have spiritual strength, self-control, personality, intelligence, noble character, as well as the necessary skills of himself, society, nation, and country." (SISDIKNAS, 2006:72)

Teaching mathematics in primary schools aims to prepare students for more formal math teaching at the gas level. This goal is directed at two outcomes, namely motivating students to learn math and providing basic knowledge of mathematics to students, especially elementary school students. The first result is realized in the form of learning that motivates students to play an active role and cooperate with their friends. The second result is realized by providing an explanation of the material presented.

Why math lessons are learned by students from the early grades this is because mathematics is a discipline that has a distinctive nature when compared to other disciplines, because mathematics deals with abstract ideas or concepts arranged hierarchically and deductive reasoning (Sukayati & Agus Suharja, 2009:1). This will certainly lead to the occurrence of the mathematics learning process. In addition, this lesson can be applied in everyday life.

In fact, the problem faced in the field of grade 4 students at SDN Pangkatrejo II, Lamongan Subdistrict, is the difficulty of students in determining the Smallest Multiples of Fellowship and the Largest Federal Factor even most of the students do not know the factor of each number, especially many students who are less interested in math lessons because they consider that mathematics is a difficult lesson.

This can be seen from the students' learning outcomes; there are still many students who get math grades below the minimum standard of finality criteria. If presented, there are more than 50% of students, especially grade 4 students at SDN Pangkatrejo II, who score below KKM; of the total number of students of 18 students, there are only 8 students who scored above KKM whose score scale is between 70-90 with the following details: students who got a score of 70 amounted to 5 students, while those who got a score of 80 there were two students and a score of 90 amounting to 1 person from each scale. While the other ten students got grades below KKM, namely, three students got a score of 40, 2 students got a score of 50, and 5 students got a score of 60.

Many teachers, state that they have implemented group learning methods. They have divided the students into groups and given group assignments. But these teachers complained that the results of these activities were not what they expected. Students instead make good use of these activities to improve their knowledge and abilities. Even waste time by playing, joking, and so on. The students also complained of not being able to work together effectively in the group. Students who are diligent and good at sharing assignments and assessments are less fair, while students who are less diligent and less good feel minded working with their more capable friends. This happened in grade 4 of SDN Pangkatrejo II Lamongan, wherein the formative test of FPB and KPK materials that had been carried out there were less than encouraging results. Namely, there were ten students who had not been completed.

Thus, it is clear that this system demands or requires new conditions as well as either physical means or psychic means. In addition to the need for teachers who have more adequate skills and skills, new ways of working and attitudes are needed, as well as complete equipment. By realizing the symptoms or reality mentioned above, then in this study, researchers took the title "Application *of Model Cooperative Learning Type Numbered Head Together (NHT) Can Improve* Achievement of Learning Mathematics Materials KPK *and FPB Grade-IV* Students *SDN Pangkatrejo II Year Lesson 2018/2019.*" Based on the background above, it can be formulated a problem as follows "How is the improvement of student learning achievement in FPB and KPK material with the implementation of NHT model cooperative learning model in grade 4 students of SDN Pangkatrejo II Year 2018/2019?" In accordance with the above problems, this study aims to determine the improvement of student learning achievement of FPB and KPK material by applying the NHT model cooperative learning model in grade 4 students of SDN Pangkatrejo II Year 2019/2020.

Research Methods

Research Subjects

The subject of the study is where the researcher obtains information or research data. The subjects of this study were all grade 4 students of SDN Pangkatrejo II Lamongan with 18 children. The subjects that became the research material in mathematics, namely about the concept of " KPK and FPB" material semester I. The implementation of the research was carried out for 2 months, namely in Octoberber until November , which is divided into 2 cycles where each cycle is carried out in 2 meetings with an allocation of 3x 35 minutes where the first meeting for the delivery of materials by applying a cooperative learning model type NHT and meeting II for learning activities and evaluation of learning results in the formative test.

Research Design

This research uses the Class Action Research (PTK). According to pgsm project trainer team, PTK is a form of a reflective study by actors of actions carried out to improve the rational stability of their actions in carrying out tasks, deepen understanding of the actions carried out, and improve the conditions in which the learning practice is carried out (in Mukhlis, 2000: 3).

In accordance with the type of research selected, namely action research, this research uses the action research model from Kemmis and Taggart (in Sugiarti, 1997: 6), which is in the form of the spiral from one cycle to the next. Each cycle includes *planning, action, observation,* and *reflection.* Before entering the 1st cycle, preliminary action is carried out in the form of identification of the problem. Each cycle is carried out twice because of the large number of materials. Data on the implementation of learning and changes that occur in the classroom, taken based on direct observations using observation sheets and interviews. Data about students' learning outcomes is taken through a test of learning outcomes, in this study using qualitative descriptive analysis techniques, which is a research method that describes reality or fact in accordance with the data obtained with the aim of knowing the learning achievements achieved by students as well as to obtain student responses to learning activities and student activities during the learning process.

Results and Discussion

Pre-Action Data Exposure

The mathematical learning of combination materials implemented by previous researchers used more lecture methods and was more teacher-centered. This results in low results achieved by students during the implementation of formative tests for the material. From the formative test results on FPB and KPK materials, the results obtained were less encouraging where out of 18 students who achieved grades above the new KKM 8 students or 44.4%with an average score of 62.2. Here are the formative test results of pre-action students as preliminary data.

Table 1 Pre-Action Student Formative Test Scores

No. Sort	Score	Description		No. Sort	Score	Description	
		Q	Tt			Q	Tt
1	70	√		10	80	√	
2	70	√		11	60		√
3	60		√	12	40		√
4	50		√	13	90	√	
5	40		√	14	60		√
6	80	√		15	60		√
7	50		√	16	60		√
8	40		√	17	70	√	
9	70	√		18	70	√	
Amount	530	4	5	Amount	590	4	5
18/1800 Total Score Reached 1120 Average Score Reached 62.2							

Exposure to Data implementation of Action Cycle I

The implementation of actions is divided into 4 stages, namely the stages of planning, implementation, observation and reflection that form a cycle. Clearly, each action will be described as follows:

Planning

Cycle I in this study implemented in two meetings that each took 3 x 35 minutes (3 hours of lessons) with the FPB and KPK materials. The planning phase of the activities carried out by researchers

are as follows: (1) Making a Learning Implementation Plan (RPP) according to the material taught, (2) Preparing student worksheets (LKS), (3) Preparing student evaluation sheets to find out student learning outcomes after the implementation of NHT learning, (4) Preparing observation sheets for research and student activities in the learning process.

Implementation of actions

The first meeting, the implementation phase of this action, was held on Tuesday, November 5, 2018, with FPB material. In the implementation of the action, the researcher was assisted by a teacher as a colleague who observed the learning process. At the time of the action, observers made observations using observation sheets that had been prepared by researchers before. Observers observe all activities carried out by researchers and students without interfering with student learning activities. The stages of implementing learning using NHT type cooperative learning l mode are as follows:

Initial activities, learning activities begin with daily routine activities, namely researchers who act as teachers open teaching and learning activities by saying greetings, which are then answered simultaneously by students. Then the researchers conditioned the class so that students are ready to follow the learning process. After that, the researchers conveyed to the students the learning objectives to be achieved on the FPB material.. Furthermore, the teacher divided the students into three groups, and each member of the group got their own number.

In core activities, researchers distributed student worksheets (LKS); each student got one LKS. Then the researchers asked students to read and understand the FPB material. Under-understanding students were asked to ask questions and researchers explained some of the material the students lacked. In the next step, the researchers asked the students to work on some of the problems in LKS. With the help of researchers, students do LKS well. In working on the problem, there are still students who have difficulty, so need personal guidance from researchers.

In this case, the researchers invite students to understand what problems are in the problem and then invite students to think about finding a way to solve the problem. Furthermore, researchers guide students to solve the problem. And not to forget, also researchers motivate students to stay diligent in learning and consider math is an important lesson. The researchers asked several students from each group with the same number to come forward to work on the problems in the LKS. Then ask some of the other students to respond to the results of the students' work that came forward. This activity is carried out over and over again until all students have a turn to work on the problem. After completion, the researchers responded to the students' answers by providing reinforcement and motivation.

The final activity, the end of the research, learning activity, thanked the students who had followed the learning process well. The researchers together with students, concluded the subject matter had been studied together. Furthermore, researchers closed the learning activities by saying hello. *The second,* in the second meeting, learning activities were carried out with KPK material in addition to the evaluation of learning outcomes. Implementation of evaluation using evaluation questions that have been prepared previously by researchers and peers. The implementation phase of this action was carried out on Thursday, November 7, 2018, with KPK material.. As at the meeting, I nature implementation of this action researcher assisted by a teacher as a colleague who observes the learning process. The stages of implementing learning using NHT type cooperative learning l mode are as follows:

Initial activities, learning activities begin with daily routine activities, namely researchers who act as teachers open teaching and learning activities by saying greetings, which are then answered simultaneously by students. Then the researchers conditioned the class so that students are ready to follow the learning process. After that, the researchers conveyed to the students the learning objectives to be achieved in the KPK material. Furthermore, the teacher divided the students into three groups, and each member of the group got their own number. *In the core activity,* researchers, distributed student worksheets (LKS); each student got one LKS. Then the researchers asked students to recall KPK material that had been studied before. Under-understanding students were asked to ask questions and researchers explained some of the material the students lacked. In the next step, the researchers asked the students to work on some of the problems in LKS. With the help of researchers, students do LKS well. In

working on the problem, there are still students who have difficulty, so need personal guidance from researchers.

In this case, the researchers invite students to understand what problems are in the problem and then invite students to think about finding a way to solve the problem. Furthermore, researchers guide students to solve the problem. And not to forget, also researchers motivate students to stay diligent in learning and consider math is an important lesson. The researchers asked several students from each group with the same number to come forward to work on the problems in the LKS. Then ask some of the other students to respond to the results of the students' work that came forward. This activity is carried out over and over again until most students get a turn to work on the problem. After completion, the researchers responded to the students' answers by providing reinforcement and motivation.

The final activity, the end of the research, learning activity, thanked the students who had followed the learning process well. Researchers, together with students, concluded the subject matter had been studied together. Furthermore, the evaluation of learning outcomes is carried out. Peneliti closes the learning activities by saying hello. The evaluation results in a cycle I are as follows:

Table 2 Formative test values on cycle I

No. Sort	Score	Description		No. Sort	Score	Description	
		Q	Tt			Q	Tt
1	80	√		10	80	√	
2	80	√		11	80	√	
3	60		√	12	50		√
4	70	√		13	100	√	
5	50		√	14	60		√
6	90	√		15	80	√	
7	80	√		16	60		√
8	60		√	17	70	√	
9	90	√		18	80	√	
Amount	660	6	3	Amount	660	6	3
18/1800 Number of Scores Reached 1320 Average Score Reached 73.3							

Description:

T	: Complete
TT	: Incomplete
Total completed students	: 12
Number of unfinished students	: 6
Classic	: Incomplete

Table 3 Recapitulation of students' formative test results in cycle I

No.	Description	Cycle I Results
1	Average formative test scores	73,3
2	Number of students completing their study	12
3	Percentage of learning completion	66,7%

From the table above, it can be explained that by applying a cooperative learning model type *Numbered Head Together obtained* the average value of student learning achievement is 73.3 , and learning completion reaches 66.7%or there are 12 students out of 18 students have completed learning. The results showed that in the first cycle, classically, students have not completed the learning,

because students who get a score of ≥65 is only 66.7%less than the desired completion percentage of 80%. This is because students still do not understand the material.

Data Collection Stage. Observations on this research are carried out on each action implementation. Observations made by colleagues as observers. Observers are tasked with observing the activities of researchers and student activities during the study.

Table 4 Data assessment of researcher activity cycle I

No.	Assessed aspects	Assessment				Criteria
		1	2	3	4	
I	**KBM Observations** **A. Introduction**					
	1. Motivate students			Ö		Pretty good
	2. Conveying learning objectives		Ö			Not good enough
	3. Connecting with previous lessons		Ö			Not good enough
	4. Organize students in study groups				Ö	Good
	B. Core Activities					
	1. Present the steps of cooperative learning models.			Ö		Pretty good
	2. Train cooperative skills		Ö			Not good enough
	3. Supervise each group in turns		Ö			Not good enough
	4. Provide assistance to groups experiencing difficulties			Ö		Pretty good
	C. Cover					
	1. Guiding students to create a summary		Ö			Not good enough
	2. Provide evaluation (Meeting II)			Ö		Pretty good
II	**Classroom Atmosphere**					
	1. Enthusiastic students and teachers		Ö			Not good enough
	2. Time according to allocation		Ö			Not good enough
	3. KBM in accordance with rpp and syllabus scenarios			Ö		Pretty good
	Amount	32				
	Percentage	61,5%				

Table 5 Data assessment aktivitas siswa siklus I

No.	Assessed aspects	1	2	3	4	Criteria
1	Students are encouraged to use critical thinking skills.			Ö		Good Enough

2	Students are encouraged to use creative thinking skills		Ö			Not Good
3	Students learn in a state of enthusiasm and joy.		Ö			Not Good
4	Student interaction with students			Ö		Good Enough
5	Student interaction with the teacher occurs.			Ö		Good Enough
6	Students take advantage of the opportunity to express their opinions and presentations		Ö			Not Good
7	Students talk about sharing experiences (working together)			Ö		Good Enough
8	Students carry out reflections			Ö		Good Enough
	Amount	21				
	Percentage	65,6%				

Reflection

Reflection is the result of research actions conducted to see provisional results of the application of NHT type cooperative learning to improve students' math learning outcomes. The results of this evaluation are then used as a reference for improvement in the preparation of action plans in the next cycle. Based on reflection activities on the final test results of the cycle I, observing results, and interview results can be obtained as follows: (a) Learning activities in the classroom sound crowded because the teacher has not been able to control the class to the maximum. (b) Student activities in the implementation of learning are still hesitant in raising questions and statements. (c) When given a question, not all students work individually. (d) The recognition of students that they are still confused by the material studied. (e) Student learning outcomes of the final test of the action given by the researchers showed that the learning results were not yet maximal, so there needs to be the improvement of learning in the next cycle. But for the indicator, explain the alliance factor of two numbers and mention the two-number fellowship factor has reached the maximum result wherefrom the evaluation test results all students have answered correctly so that for the indicator in cycle II is no longer raised.

The problems that arise as mentioned above, caused by several factors, including: (a) Students, are not familiar with NHT type cooperative learning,(b) students are still reluctant to ask questions to researchers related to the material submitted, (c) students are still less confident in their abilities, so they still rely on their friends in solving test questions given by researchers, (d) Students have not been able to understand the material to the maximum.

Teaching and learning activities in the first cycle still have shortcomings in both research activities and student activities. This can be seen by the problems that arise and the factors that cause them. Therefore, researchers are working to make improvements that will be carried out in the next cycle. The efforts made by researchers are as follows:

a) Researchers should try to explain to students about the ease of understanding the material through NHT-type cooperative learning.
b) Researchers try to motivate students to be more confident in answering or asking if there are materials that they do not understand
c) Researchers really need to pay attention and provide guidance to students so that students have a passion for learning so that their learning outcomes can improve.

d) Researchers should seek to provide an easy-to-understand explanation and direct students to a good understanding of the material.

Exposure to Data implementation of Action Cycle II

The implementation of actions is divided into 4 stages, namely the stages of planning, implementation, observation, and reflection that form a cycle. Clearly, each action will be described as follows:

Planning

Cycle II in this study was planned in two meetings, which each took 3 x 35 minutes (3 hours lessons) with the FPB and KPK materials. In the planning stage of activities carried out by researchers in the following fields:

1. Make a Learning Implementation Plan (RPP) according to the material taught.
2. Prepare student worksheets (LKS).
3. Prepare a student evaluation sheet to find out the student's learning outcomes after the implementation of NHT type cooperative learning
4. Prepare observation sheets for research and student activities in the learning process.
5. Coordinating with peers

Implementation of actions

The first meeting, the implementation phase of this action, was held on Tuesday, November 12, 2018. In the implementation of the action, the researcher was assisted by a teacher as a colleague who observed the learning process. At the time of the action, observers made observations using observation sheets that had been prepared by researchers before. Observers observe all activities carried out by researchers and students without interfering with student learning activities. The stages of implementing learning using NHT type cooperative learning l mode are as follows:

Initial activities, learning activities begin with daily routine activities, namely researchers who act as teachers open teaching and learning activities by saying greetings, which are then answered simultaneously by students. Then the researchers conditioned the class so that students are ready to follow the learning process. After that, the researchers conveyed to the students the learning objectives to be achieved on the FPB material.. Furthermore, the teacher divided the students into 6 groups, and each member of the group got their own number.

In core activities, researchers distributed student worksheets (LKS); each student got one LKS. Then the researchers asked students to read and understand FPB and KPK materials. Under-understanding students were asked to ask questions and researchers explained some of the material the students lacked. In the next step, the researchers asked the students to work on some of the problems in LKS. With the help of researchers, students do LKS well. In working on the problem, there are still students who have difficulty, so need personal guidance from researchers.

In this case, the researchers invite students to understand what problems are in the problem and then invite students to think about finding a way to solve the problem. Furthermore, researchers guide students to solve the problem. And not to forget, also researchers motivate students to stay diligent in learning and consider math is an important lesson. The researchers asked several students from each group with the same number to come forward to work on the problems in the LKS. Then ask some of the other students to respond to the results of the students' work that came forward. This activity is carried out over and over again until all students have a turn to work on the problem. After completion, the researchers responded to the students' answers by providing reinforcement and motivation.

The final activity, the end of the research, learning activity, thanked the students who had followed the learning process well. Researchers, together with students, concluded the subject matter had been studied together. Furthermore, researchers closed the learning activities by saying hello.

Second Meeting

At this second meeting, learning activities were carried out with KPK material in addition to the implementation of the evaluation of learning outcomes. Implementation of evaluation using evaluation questions that have been prepared previously by researchers and peers. The implementation phase of this action was carried out on Thursday, November 14, 2019, with KPK material. As at the meeting, I nature implementation of this action researcher assisted by a teacher as a colleague who observes the learning process. The stages of implementing learning using NHT type cooperative learning l mode are as follows:

Initial activities, learning activities begin with daily routine activities, namely researchers who act as teachers open teaching and learning activities by saying greetings, which are then answered simultaneously by students. Then the researchers conditioned the class so that students are ready to follow the learning process. After that, the researchers conveyed to the students the learning objectives to be achieved in the KPK material. Furthermore, the teacher divided the students into six groups, and each member of the group got their own number.

In the core activity, researchers distributed student worksheets (LKS); each student got one LKS. Then the researchers asked students to recall KPK material that had been studied before. Under-understanding students were asked to ask questions and researchers explained some of the material the students lacked. In the next step, the researchers asked the students to work on some of the problems in LKS. With the help of researchers, students do LKS well. In working on the problem, there are still students who have difficulty, so need personal guidance from researchers. In this case, the researchers invite students to understand what problems are in the problem and then invite students to think about finding a way to solve the problem. Furthermore, researchers guide students to solve the problem. And not to forget, also researchers motivate students to stay diligent in learning and consider math is an important lesson.

The researchers asked several students from each group with the same number to come forward to work on the problems in the LKS. Then ask some of the other students to respond to the results of the students' work that came forward. This activity is carried out over and over again until most students get a turn to work on the problem. After completion, the researchers responded to the students' answers by providing reinforcement and motivation.

The final activity, the end of the research, learning activity, thanked the students who had followed the learning process well. Researchers, together with students, concluded the subject matter had been studied together. Furthermore, the evaluation of learning outcomes is carried out. Peneliti closes the learning activities by saying hello. The evaluation results in cycle II are as follows:

Table 6 Formative test values in cycle I

No. Sort	Score	Description		No. Sort	Score	Description	
		Q	Tt			Q	Tt
1	90	√		10	60		√
2	70	√		11	80	√	
3	70	√		12	50		√
4	70	√		13	100	√	
5	50		√	14	70	√	

6	100	√		15	80	√	
7	70	√		16	70	√	
8	60		√	17	80	√	
9	90	√		18	80	√	
Amount	670	7	2	Amount	670	8	1
18/1800 Total Score Reached 1340 Average Score Reached 74.4							

Description:
Q : Complete
TT : Incomplete
Total completed students : 15
Number of incomplete students : 3
Classic : Tuntas

Table 7 Recapitulation of students' formative test results in cycle II

№	Description	Result of Cycle II
1	Average formative test scores	74,4
2	Number of students completing their study	15
3	Percentage of learning completion	83,3%

From the table above, it can be explained that by applying a cooperative learning model *type Numbered Head Together obtained* the average value of student learning achievement is 74.4 and learning completion reaches 83.3%or there are 15 students out of 18 students have completed learning. Secara classical students have completed the learning, because students who get a score of ≥65 about 83.3% greater than the desired percentage of completion of 80%. The results in cycle II have improved better than cycle I. The improvement of learning outcomes in the second cycle is influenced by the increasing ability of teachers to implement cooperative learning models numbered head together so that students become more accustomed to this kind of learning and students are easier to understand the materials given.

Data Collection Stage

Observations on this research are carried out on each action implementation. Observations made by colleagues as observers. Observers are tasked with observing the activities of researchers and student activities during the study. Give the results of the assessment of the activities of teachers as researchers and students as the subject of research.

Table 8 Data Assessment of Research Activity Cycle II

№	Assessed aspects	Assessment				Criteria
		1	2	3	4	
I	**KBM Observations** **A. Introduction**					
	1. Motivate students			Ö		Good Enough
	2. Conveying learning objectives			Ö		Good Enough
	3. Connecting with previous lessons				Ö	Good

	4. Organize students in study groups				Ö	Good
	B. Core Activities					
	1. Present the steps of cooperative learning models.				Ö	Good
	2. Train cooperative skills				Ö	Good
	3. Supervise each group in turns			Ö		Good Enough
	4. Provide assistance to groups experiencing difficulties				Ö	Good
	C. Cover					
	1. Guiding students to create a summary				Ö	Good
	2. Provide evaluation				Ö	Good
II	**Classroom Atmosphere**					
	1. Enthusiastic students and teachers			Ö		Good Enough
	2. Time according to allocation			Ö		Good Enough
	3. KBM in accordance with rpp and syllabus scenarios				Ö	Good
	Amount	47				
	Percentage	90,4%				

Table 9 Data Assessment Aktivitas Siswa Siklus II

№	Assessed aspects	1	2	3	4	Criteria
1	Students are encouraged to use critical thinking skills.				Ö	Good
2	Students are encouraged to use creative thinking skills				Ö	Good
3	Students learn in a state of enthusiasm and joy.			Ö		Good Enough
4	Student interaction with students				Ö	Good
5	Student interaction with the teacher occurs.			Ö		Good Enough
6	Students take advantage of the opportunity to express their opinions and presentations				Ö	Good
7	Students talk about sharing experiences (working together)				Ö	Good
8	Students carry out reflections				Ö	Good
	Amount	30				
	Percentage	93.8%				

Reflection

After obtaining the data, it is carried out reflection. At the reflection stage of the researchers, together with observers, discussed the advantages and disadvantages of learning activities that have been implemented by the application of cooperative learning model *type Numbered Heads Together*. The data that have been obtained can be obtained as follows:

1) The teacher has implemented all the learning steps in RPP well. Although the implementation is not perfect, there have been improvements.

2) Based on the observation data, it is known that students are active during the learning process.
3) Deficiencies in previous cycles have improved and improved so that it becomes better.
4) Students' learning outcomes in the second cycle achieved completeness.

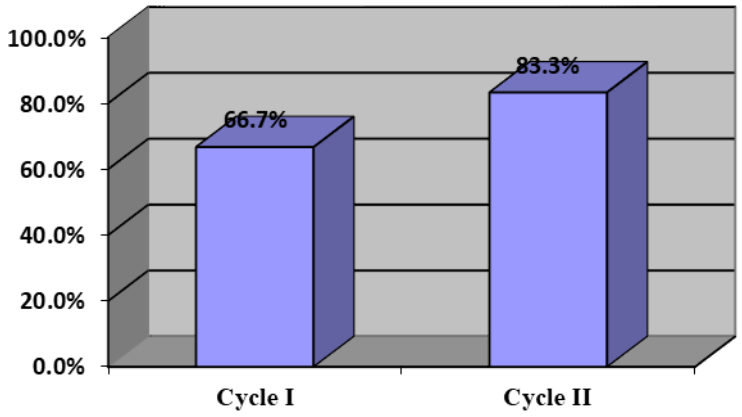
In the second cycle, teachers have implemented a cooperative learning model *type Numbered Head Together well,* and judging by the student's activities and student learning outcomes, the implementation of the teaching and learning process has been running well. So there is no need for too many revisions, but what needs to be considered for the next action is to maximize and maintain what is already there with the aim that in the implementation of the teaching and learning process, the next application of the cooperative learning model *type Numbered Head Together can improve the* teaching and learning process so that the learning objectives can be achieved.

Discussion

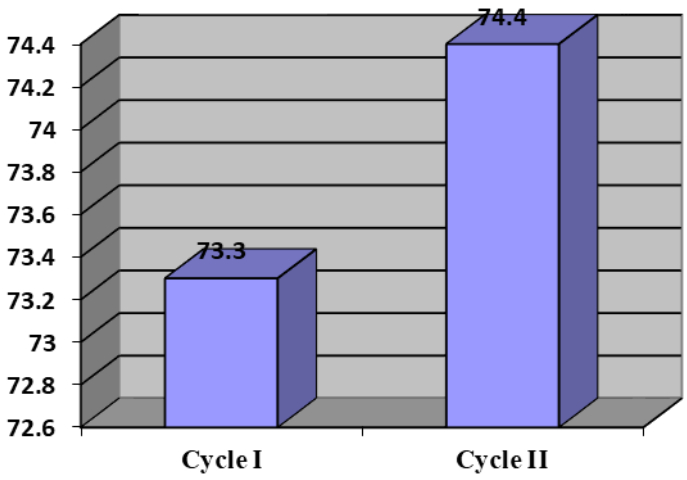
The completeness of students' learning outcomes

Based on the data obtained from the research results of the cooperative learning model, the *numbered head together type has* a positive impact on improving student learning achievement. This can be seen from the strengthening of

Students' understanding of the material delivered by teachers proved that the completeness of learning, increased from cycles I and II, namely 66.7% and 83.3%, respectively. %. In addition, the average score of formative tests obtained by students also increased from cycle I 73.3 to 74.4 in the second cycle. In the second cycle, the completeness of students' learning has classically been achieved.



Graph 10 Completed student grades



Graph 11 Average student grades

Teachers' ability to manage to learn

Based on data analysis, teachers' ability in the process of the *numbered head together* cooperative learning model in each cycle has increased. This has a positive impact on improving the quality of learning so that learning objectives and research objectives are achieved.

Teacher and student activities in learning

Based on data analysis, students' activities in the mathematics learning process on the subject matter of FPB and KPK with cooperative learning model *numbered head together type are* the most dominant is working with group friends, listening/paying attention to teacher explanations, doing tasks, and discussions between students / between students and teachers. So it can be said that student activities can be categorized as active. As for teacher activities during the learning, they have implemented the steps of the Numbered Head Together type cooperative learning model well. This can be seen from the teacher activities that arise, including dividing students in small groups, guiding and observing students in discussions and working on exercises, explaining material that is difficult to understand, giving feedback/evaluation / question and answer where the percentage for the above activities is quite large.

Conclusion

From the results of learning activities that have been done during a cycle, and based on all discussions and analysis that have been done can be concluded as follows: (1) Learning with cooperative model type Numbered Heads Together has a positive impact in improving student learning achievement characterized by improving student learning completeness in each cycle, namely cycle I 66.7%and cycle II 83.3%. (2) The application of cooperative learning model *numbered head together has a* positive influence, which is able to improve students' skills in solving problems related to KPK and FPB shown by the increasing number of children who can do problems about KPK and FPB well. They also stated that with this method of learning, there are variations in teaching and learning activities.

Advice

From the results of the research obtained from the previous description so that the teaching and learning process of Mathematics is more effective and more provide optimal results for students, it is conveyed the following advice: (1) To carry out a cooperative learning model type Numbered Head

Together requires a fairly mature preparation, so that teachers must be able to determine or choose topics that can really be applied with a cooperative model type Numbered Heads Together in the teaching and learning process so that optimal results are obtained. (2) In its efforts to improve student learning achievement, teachers should make more use of various learning models even at a simple level, so that students do not get bored with one of the learning models so that students can easily understand a new concept and the student succeeds or is able to solve the problems he/she faces. (3) Further research is needed because of the results of this research can only be found in Grade IV SDN Pangkatrejo II Lamongan in the 2018/2019th year. Similar research should be made, improvements in order to obtain better results.

Reference

Arikunto, Suharsimi. 2006. *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: Rineksa Cipta

Arikunto, Suharsimi. 2001. *Dasar-dasar Evaluasi Pendidikan*. Jakarta: Bumi Aksara.

Hamdani, Saepul,dkk. 2008. *Matematika 1 Edisi Pertama Paket 1-7*. Surabaya: LAPIS-PGMI

Isjoni. 2010. *Cooperative learning mengembangkan kemampuan belajar berkelompok*. Bandung: Alfabeta

Mustaqim, Burhan & Astuty, Ary. 2008. *Ayo Belajar Matematika Kelas IV*. Jakarta: Pusat Perbukuan DEPDIKNAS

Nur, Moh. 2001. *Pemotivasian Siswa untuk Belajar*. Surabaya. University Press. Universitas Negeri Surabaya.

Rusman. 2011. *Model-model Pembelajaran Mengembangkan Profesionalisme Guru*. Jakarta: PT RajaGrafindo Persada.

Sardiman. 2004. *Interaksi dan Motivasi Belajar Mengajar*. Jakarta: PT RajaGrafindo Persada.

Slameto. 2003. *Belajar dan Faktor-faktor yang Mempengaruhinya*. Jakarta: PT Rineka Cipta.

Sudrajat, akhmad. 2008. *pengertian-pendekatan-strategi-metode-teknik-taktik-dan-metode-pembelajaran.* http://akhmadsudrajat.com/ Diakses tanggal 26 Oktober 2018

----------,2006. *Undang-undang Republik Indonesia Nomor 20 tahun 2003 tentang SISDIKNAS*.. Bandung: Citra Umbara