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# TEAMS GAMES TOURNAMENT TYPE COOPERATIVE LEARNING MODEL AS A SOLUTION TO IMPROVE MATHEMATICS LEARNING OUTCOMES INTEGER CALCULATION OPERATION MATERIAL IN GRADE VI STUDENTS OF AL-AZHAR BEKASI ELEMENTARY SCHOOL

Hendhisca Cipta[1], Yudi Budianti[2], Muslimah[3]
Universitas Islam 45 Bekasi
hendhisca@gmail.com ; yudibudianti24@gmail.com

**Abstract**

*Mathematics is one of the most important subjects to be mastered well by students, this is because learning mathematics has benefits for everyday life. This study aims to improve learning outcomes in mathematics in elementary school students and to apply the Teams Games Tournament (TGT) learning model in improving mathematics learning outcomes of elementary school students. This study used a qualitative approach and the data analysis process emphasized the conclusion of comparative literature reviews from several scientific journals. The results showed that using the Teams Games Tournament type cooperative learning model can improve mathematics learning outcomes in the cognitive aspect, thus it can be concluded that the Teams Games Tournament type cooperative learning model can be used as a solution to improve mathematics learning outcomes in elementary schools. Because it is in accordance with the characteristics of elementary school children who like to group, like to play and like to move.*

***Keywords***: *TGT model, Learning Outcomes, Mathematics*

## INTRODUCTION

Mathematics is one of the most important subjects mastered by students, this is because learning mathematics has benefits for everyday life. Therefore, mathematics is studied at every level of education from elementary school to college. According to Amir in Nisa Inarotul Aulia and Hany Handayani (2018) stated that mathematics subjects at the elementary level in addition to obtaining mathematics itself, are also to develop the thinking power of students logically, analytically, systematically, critically, creatively,

develop habitual patterns of working together in solving problems, and shape children's personalities and are guided by the development of science and technology. So it can be concluded that mathematics is a very important science to learn because it concerns everyday life through experience and the use of concrete objects to shape the child's personality in developing modern science and technology (Tsuei, 2012).

According to Permendepdiknas No. 22 of 2006, mathematics learning in schools has important objectives, namely: (1) Train the way of thinking and reasoning in the form of drawing conclusions; (2) Develop activities involving imagination, intuition and discovery by developing divergent thinking, curiosity, prediction and conjecture and experimentation; (3) Develop problem-solving skills; (4) Develop the ability to convey information or communicate ideas (Slavin, 2015).

In learning Mathematics in Elementary School, teachers play a role in improving student learning outcomes, because in fact Mathematics learning is often faced with problems where student learning outcomes are low against previously learned material. Based on a mathematics seminar held at the BPPT Jakarta building by Fahrur Hadi Siwoyo said that 9 out of 10 Indonesian children do not like mathematics lessons, because students consider mathematics a difficult subject, they assume that most mathematics teachers are hard in educating and are considered to give bad grades most often. In line with the journal study according to Asep Priatna and Fahma Safitri (2017) stated that one of the subjects that is considered complicated and boring to be given to students is mathematics (Dema Yulianto et al., 2023).

Based on the results of a study of several journals, a problem was found in elementary school students, namely the low learning outcomes of students in mathematics subjects (Lestari et al., 2019). It found several problems such as the number of students with mathematics scores below KKM compared to those who exceeded the predetermined KKM, students were less enthusiastic and interested in learning to follow mathematics lessons, the strategies or learning models used by teachers were still monotonous or conversional, in the presentation of teacher subject matter was also less innovative and creative in using learning models. So certain tips or learning models are needed that can stimulate student motivation to actively learn so that the material presented is easier for students to understand(Zakaria & Iksan, 2007).

To overcome these mathematical problems by using innovative learning models. One innovative learning model that can be used is the Teams Games Tournamet (TGT) learning model. The Teams Games Tournamet (TGT) learning model was chosen because it suits the characteristics of elementary school children who like to group, like to play and like to move (Panggabean et al., 2021).

According to Sudha in Amanda Purwandari and Dyah Tri Wahyuningtyas (2017) the application of the Teams Games Tournamet (TGT) type cooperative learning model can make students collaborate and motivate each other with different abilities, so that students can be more interested, not give up easily and always be active in following and completing their tasks in the learning process (Munir et al., 2022). According to Asep Priatna and Fahma Safitri (2017), the Teams Games Tournament (TGT) type cooperative learning model is well applied, because in this cooperative learning it does not only work in groups, but there are games that are presented in tournaments(Kholidah & Qohar, 2021).

## METHODS

This research uses a qualitative approach and the data analysis process emphasizes more on concluding a comparison of literature reviews from several scientific journals. Data collection in this study was carried out by browsing journals on several electronic media such as the internet, online journals, and online libraries. According to Kuncoro (2013) states that the purpose of a literature review is to see what and the extent of activities that have been carried out that are related to the problem under study. In line with that, Cresswell (2014) argues that literature review is a literature analysis on a research topic with the aim of informing about the results of previous research that has been carried out related to the current research being carried out, linking a study with existing literature, and filling spaces in previous research.

## RESULTS

Based on the results of research studies in several journals, there are problems in mathematics learning, namely when learning activities take place students only act passively in learning activities, students are less enthusiastic and interested in learning to follow mathematics lessons, lack student attention in learning and like to do something that is not

related to the lesson. In addition, various data on student learning outcomes in the previous academic year showed low student scores, it is known that the average score obtained by students is below the minimum standard or predetermined KKM, the learning strategy or model used by teachers is still monotonous, in the delivery of teacher subject matter is also less innovative and creative in using learning models (Ke, 2008).

The research was conducted at MIS Hidayatussalam, Jl. Puskesmas, Dusun VII, Bandar Khalifah Village, Percut Sei Tuan District, through the Teams Games Tournament (TGT) learning strategy in mathematics subjects, integer operation material in Class IV. Before taking action with the implementation of the Teams Games Tournament (TGT) learning strategy, researchers first interviewed the teacher of grade IV mathematics subject MIS Hidayatussalam. Based on the results of the interview, student learning outcomes in mathematics subjects are still relatively low. The low learning outcomes of students in mathematics subjects can be seen from the list of grades in the first semester (odd) of class IV MIS Hidayatussalam with a total of 38 students, Of the 38 students who reached KKM only 10 students, the score is still concerning. The minimum completion criterion for mathematics students at the school is 80. From the acquisition of this value, it shows that the mastery of the material has not been completed (Puspita Dewi & Arini, 2020).

**1. Pre Action**

Before researchers conduct classroom action research (PTK), researchers conduct pre-tests to find out problems with learning outcomes and pictures of how to handle students in class IV. Based on the results of the pre-action obtained, it is still relatively low. The results of obtaining student scores in the given pre-action can be seen from the table as follows:

Table 1. Student Learning Outcomes During Pre Test

| No | Student name | Value | Information |
|---|---|---|---|
| 1 | ABBAS SANI NST | 60 | Incomplete |
| 2 | AFIFAH SYARIAH | 60 | Incomplete |
| 3 | AYESHA SILVA NST | 60 | Incomplete |
| 4 | ALIFAH SYARIFAH H | 50 | Incomplete |
| 5 | ALIZA RISKY NUR | 50 | Incomplete |
| 6 | ANGGI NAULI HSB | 60 | Incomplete |
| 7 | ANNISA AZZAHRA | 60 | Incomplete |

| | | | |
|---|---|---|---|
| 8 | BASYA DWI ANGGARA | 40 | Incomplete |
| 9 | CARISSA RIFA S. | 30 | Incomplete |
| 10 | LOVE AULIA KASIH | 30 | Incomplete |
| 11 | GODDESS SAFIRA | 50 | Incomplete |
| 12 | DILA REISYAH AMAND NST | 60 | Incomplete |
| 13 | DWI MARISA | 30 | Incomplete |
| 14 | FAKIRA ANISA | 30 | Incomplete |
| 15 | IMAM FAHANSAYAH | 40 | Incomplete |
| 16 | KEILA AULIA PRANITA | 30 | Incomplete |
| 17 | LULU SALSABILA | 50 | Incomplete |
| 18 | MAULANA FADLI SIREGAR | 40 | Incomplete |
| 19 | M. ALWI SIHAB HSB | 50 | Incomplete |
| 20 | M. DIKI AKMAL | 40 | Incomplete |
| 21 | M. IDRUS SANI | 30 | Incomplete |
| 22 | M. IHSAN AULIA | 40 | Incomplete |
| 23 | M. MIJA RAFFI | 40 | Incomplete |
| 24 | M. RASHID ALFARISI | 50 | Incomplete |
| 25 | M. RASHID FIRDAUS | 30 | Incomplete |
| 26 | M. ROBI WIJAYA | 40 | Incomplete |
| 27 | M. ZAKI AULADI | 50 | Incomplete |
| 28 | MUTIA AGRAINI | 30 | Incomplete |
| 29 | NADIA MUTIA SYAFITRI | 40 | Incomplete |
| 30 | NIA RAHMAYANI | 30 | Incomplete |
| 31 | RAISYAH ANDINI | 60 | Incomplete |
| 32 | REFI RIVANI | 50 | Incomplete |
| 33 | RIFANSYAH | 40 | Incomplete |
| 34 | RRISKI HARYO | 40 | Incomplete |
| 35 | SILVIA JESUF | 50 | Incomplete |
| 36 | TIARA AMANDA LUBIS | 70 | Incomplete |
| 37 | TIARA DWI WULANDARI | 50 | Incomplete |
| 38 | TIARA DILA AMANDA | 60 | Incomplete |
| Sum | 1.720 | | |
| Average | 45,26 | | |

From table 4.1 above, it can be seen that students' ability to master the material Integer Operations With this, the class average score reached 45.26 from 38 students who attended and none of the students completed the Pre test.

**Table 2. Student Learning Success Rate**

| No | Completion Percentage | Completeness Rate | Multiple Students |
|---|---|---|---|
| 1 | 100% | Incomplete | 38 |
| 2 | 0% | Complete | 0 |
| **Sum** | **100%** | | **38 Students** |

From table 4.2 above, the percentage of success is 0%, in other words, that no students have completed the pre-test that has been given. Based on the level of student learning failure in the initial test (pre test) can be described in graphic form as follows:

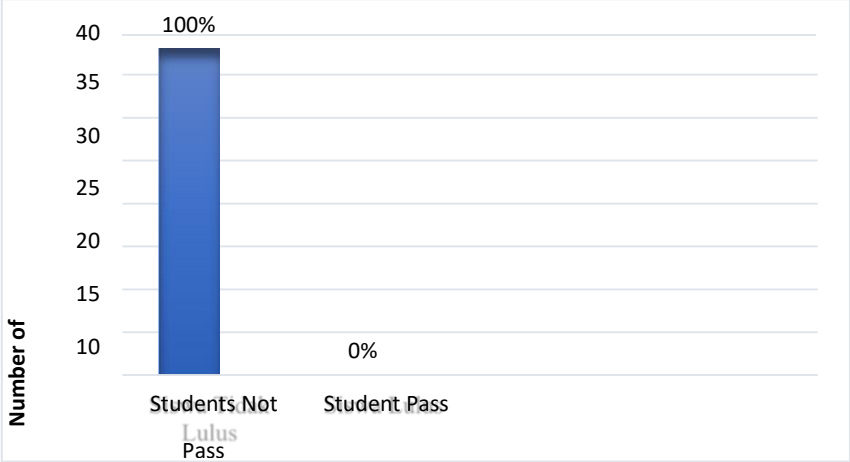


**Figure 1. Student Learning Outcomes on Pre-test**

Based on the results of this Pre-test, it shows that students still have difficulty in solving problems and lack understanding of integer operation material due to:

a. Students lack understanding of Integer Operations.
b. Students are less thorough in doing practice about Integer Operations.

After knowing the difficulties experienced by students, researchers take action in the form of using strategies that will be used to solve problems, which previously researchers had planned the strategy to be used is the Team Game Tournament. Based on the results above, researchers made learning improvements by continuing the first cycle using the Team Game Tournament strategy on Integer Operation material In the implementation of

this action, the researcher acts as a teacher, while the teacher of the subject concerned acts as an observer.

**2. Implementation of Action I**

At this stage the teacher carries out learning activities using the planning guidelines that have been made. The implementation of actions is flexible and open to changes. Action learning I cycle I is carried out in one meeting. At the first cycle action meeting, the teacher utilizes the team game tournament strategy in learning by collaborating with learning methods, namely group work and tournaments At the end of the meeting conduct formative tests. Students are guided by the teacher to infer the results of the project integer operations. The activity ended by motivating students to increase their awareness and responsibility of how important it is to learn mathematics and practice it in everyday life (In'am & Sutrisno, 2020).

**Table 3. Student Learning Outcomes During Post Test I**

| No | Student name | Value | Information |
|---|---|---|---|
| 1 | ABBAS SANI NST | 70 | Incomplete |
| 2 | AFIFAH SYARIAH | 80 | Complete |
| 3 | AYESHA SILVA NST | 70 | Incomplete |
| 4 | ALIFAH SYARIFAH H | 70 | Incomplete |
| 5 | ALIZA RISKY NUR | 80 | Complete |
| 6 | ANGGI NAULI HSB | 80 | Complete |
| 7 | ANNISA AZZAHRA | 90 | Complete |
| 8 | BASYA DWI ANGGARA | 70 | Incomplete |
| 9 | CARISSA RIFA S. | 70 | Incomplete |
| 10 | LOVE AULIA KASIH | 70 | Incomplete |
| 11 | GODDESS SAFIRA | 80 | Complete |
| 12 | DILA REISYAH AMAND NST | 80 | Complete |
| 13 | DWI MARISA | 80 | Complete |
| 14 | FAKIRA ANISA | 70 | Incomplete |
| 15 | IMAM FAHANSAYAH | 80 | Complete |
| 16 | KEILA AULIA PRANITA | 60 | Incomplete |
| 17 | LULU SALSABILA | 80 | Complete |
| 18 | MAULANA FADLI SIREGAR | 80 | Complete |
| 19 | M. ALWI SIHAB HSB | 60 | Incomplete |

| | | | |
|---|---|---|---|
| 20 | M. DIKI AKMAL | 80 | Complete |
| 21 | M. IDRUS SANI | 80 | Complete |
| 22 | M. IHSAN AULIA | 90 | Complete |
| 23 | M. MIJA RAFFI | 70 | Incomplete |
| 24 | M. RASHID ALFARISI | 80 | Complete |
| 25 | M. RASHID FIRDAUS | 70 | Incomplete |
| 26 | M. ROBI WIJAYA | 80 | Complete |
| 27 | M. ZAKI AULADI | 70 | Incomplete |
| 28 | MUTIA AGRAINI | 70 | Incomplete |
| 29 | NADIA MUTIA SYAFITRI | 70 | Incomplete |
| 30 | NIA RAHMAYANI | 70 | Incomplete |
| 31 | RAISYAH ANDINI | 80 | Complete |
| 32 | REFI RIVANI | 70 | Incomplete |
| 33 | RIFANSYAH | 80 | Complete |
| 34 | RISKI HARYO | 80 | Complete |
| 35 | SILVIA JESUF | 70 | Incomplete |
| 36 | TIARA AMANDA LUBIS | 80 | Complete |
| 37 | TIARA DWI WULANDARI | 90 | Complete |
| 38 | TIARA DILA AMANDA | 80 | Complete |
| **Sum** | **2.810** | | |
| **Average** | **73,94** | | |

**Table 4 Post Test Student Learning Success Rate 1**

| No | Completion Percentage | Completeness Rate | Multiple Students |
|---|---|---|---|
| 1 | 44,74% | Incomplete | 17 |
| 2 | 55,26% | Complete | 21 |
| **Sum** | **100%** | | **38 Students** |

Based on tables 4.3 and 4.4, it can be seen that from the test results after being given action in cycle I, grade IV students of MIS Hidayatusssalam cannot be said to be complete because the percentage of classical completeness has not reached 80%. In the first cycle, out of 38 students, 21 students or 55.26% had reached the level of learning completeness. While 17 students or 44.74% who have not achieved learning completeness with a class average of 73.94.

### 3. Observation Phase

In the observation stage, the role of an observer is the teacher of grade IV Mathematics subjects to observe the activities of teachers and students during learning. The results of teacher and student observations can be seen in the table below:

**Table 5 Teacher activity action I cycle I**

| No | Descriptors | Statement | |
|---|---|---|---|
| | | Yes | Not |
| 1 | 1. The teacher opens the lesson by reading a prayer | √ | |
| | 2. Teacher Deliver Learning objectives | √ | |
| | 3. The teacher informs the material to be studied and repeats at a glance the previous material | √ | |
| | 4. Teachers motivate student | √ | |
| 2 | 1. Use strategy Project Based Learning | √ | |
| | 2. Involve students in the utilization of strategies | √ | |
| | 3. Use spoken and written language properly, and correctly | √ | |
| 3 | 1. The teacher gives an explanation of the material to be learned using a project-based learning strategy. | √ | |
| | 2. The teacher divides students into Group | √ | |
| | Number of scores obtained | 88.9 | |
| | Percentage | 88.9% | |
| | Criterion | Excellent | |

From table 4.8 in cycle I, it can be seen that teacher activity in teaching obtained a value of 88.9 with a percentage of 88.9% and very good criteria, which can illustrate that teacher activity in cycle I runs smoothly without obstacles.

During the learning process, researchers also observed student activities. The following is a table of observations of student activities.

**Table 6. Student activity action I cycle I**

| No | Student Activities | Statement | |
|---|---|---|---|
| | | Yes | Not |
| 1. | Students listen to explanations of the material From teachers | √ | |
| 2. | Students are divided into groups | √ | |
| 3. | Students discuss to complete LK given. | √ | |
| 4. | Students record the results of the discussion into a piece of paper. | √ | |

| | | | |
|---|---|---|---|
| 5. | Students come forward as representatives group to Deliver The result of the discussion. | √ | |
| 6. | Students respond to the results of group discussions other. | | √ |
| 7. | Student Given appreciation group in the form of individual scores and group scores or appreciating group pretation. | | √ |
| 8. | Students give conclusions about the material taught. | | √ |
| **Amount of earnings** | | **80** | |
| **Percentage** | | **80%** | |

From table 4.9 it can be seen that from two indicators in the aspect of knowledge, student activity during the meeting the percentage appeared 80% with good criteria. From the results of student I activities, it can also be said that the learning process carried out is good and as expected.

**4. Reflection**

Based on the results of observations of action I cycle I that has been carried out, researchers reflect on the process and learning outcomes achieved in action I cycle I. The reflection was carried out with the teacher as a collaborator to evaluate the achievement of learning outcomes, after a formative test was carried out in Mathematics learning with the Teams Games Tournament (TGT) strategy (Umami et al., 2023). Based on observations of action I cycle I, it turns out that there is an increase from before the action. Based on the results of reflections that have been carried out by researchers, researchers take action steps in the form of directing students to concentrate more on learning during learning. With good concentration during learning, students will be able to better understand the material learned so that they are better prepared to face group discussions and tasks given to students. From the results obtained, the researcher concluded that the student had been able to achieve the expected results and the researcher continued another action in the form of action II, namely cycle II to re-measure student learning outcomes with the same subject matter with different sub-subject

## DISCUSSION

Based on reflection on cycle I, the application of the TGT method requires improvement of actions(Oktarianto & Handayanto, 2021). From the evaluation results in the implementation of the previous first cycle, it still shows several weaknesses that have not been fully successful. In the implementation of the second cycle learning process, the ability of students to solve problems is further improved. In cycle II, teachers (researchers) carry out teaching improvements to solve the obstacles that exist in cycle I by looking at reflections on cycle I. At the end of the second cycle meeting, researchers again provide questions in the form of questions as an evaluation of students. The results of obtaining cycle II values can be seen in the table.

**Table 7 Student learning outcomes during Post Test II**

| No | Student name | Value | Information |
|---|---|---|---|
| 1 | ABBAS SANI NST | 90 | Complete |
| 2 | AFIFAH SYARIAH | 90 | Complete |
| 3 | AYESHA SILVA NST | 80 | Complete |
| 4 | ALIFAH SYARIFAH H | 70 | Incomplete |
| 5 | ALIZA RISKY NUR | 90 | Complete |
| 6 | ANGGI NAULI HSB | 100 | Complete |
| 7 | ANNISA AZZAHRA | 100 | Complete |
| 8 | BASYA DWI ANGGARA | 80 | Complete |
| 9 | CARISSA RIFA S. | 90 | Complete |
| 10 | LOVE AULIA KASIH | 90 | Complete |
| 11 | GODDESS SAFIRA | 100 | Complete |
| 12 | DILA REISYAH AMAND NST | 100 | Complete |
| 13 | DWI MARISA | 90 | Complete |
| 14 | FAKIRA ANISA | 80 | Complete |
| 15 | IMAM FAHANSAYAH | 90 | Complete |
| 16 | KEILA AULIA PRANITA | 80 | Complete |
| 17 | LULU SALSABILA | 100 | Complete |
| 18 | MAULANA FADLI SIREGAR | 90 | Complete |
| 19 | M. ALWI SIHAB HSB | 70 | Incomplete |
| 20 | M. DIKI AKMAL | 90 | Complete |
| 21 | M. IDRUS SANI | 100 | Complete |
| 22 | M. IHSAN AULIA | 100 | Complete |

| | | | |
|---|---|---|---|
| 23 | M. MIJA RAFFI | 90 | Complete |
| 24 | M. RASHID ALFARISI | 90 | Complete |
| 25 | M. RASHID FIRDAUS | 100 | Complete |
| 26 | M. ROBI WIJAYA | 80 | Complete |
| 27 | M. ZAKI AULADI | 80 | Complete |
| 28 | MUTIA AGRAINI | 80 | Complete |
| 29 | NADIA MUTIA SYAFITRI | 90 | Complete |
| 30 | NIA RAHMAYANI | 80 | Complete |
| 31 | RAISYAH ANDINI | 100 | Complete |
| 32 | REFI RIVANI | 80 | Complete |
| 33 | RIFANSYAH | 80 | Complete |
| 34 | RRISKI HARYO | 90 | Complete |
| 35 | SILVIA JESUF | 90 | Complete |
| 36 | TIARA AMANDA LUBIS | 100 | Complete |
| 37 | TIARA DWI WULANDARI | 90 | Complete |
| 38 | TIARA DILA AMANDA | 100 | Complete |
| Sum | 3.390 | | |
| Average | 89,21 | | |

**Table 8. Student Learning Success Rate**

| No | Completion Percentage | Level Completeness | Multiple Students |
|---|---|---|---|
| 1 | 5,26% | Incomplete | 2 |
| 2 | 94,74% | Complete | 36 |
| **Sum** | **100%** | | **38 Students** |

From table 7 of the formative test results of Cycle II to determine the achievement of student learning outcomes as a result of learning Mathematics by utilizing strategies on integer operation material, namely students who have reached KKM 80 scores as many as 36 students with a percentage of 94.74%.

In the observation stage, the role of an observer is the teacher of grade IV Mathematics subjects to observe the activities of teachers and students during learning. The results of teacher and student observations.

From the observations, it can be seen that teacher activities when teaching reach a value of 100 percentage 100% with very good criteria which means that teacher teaching and learning activities are as expected and there are no obstacles during the learning process. During the learning process, researchers also observed student activities. The following is a table of observations of student activities.

In student activities in learning get a value of 80 percentage 80% with good criteria which can be said in the learning process has achieved the expected even though it did not reach perfect but it has brought a good impact in the learning process.

Based on the results of observations of action II cycle II that has been carried out, researchers reflect on the process and learning outcomes achieved in action II cycle II. The reflection was carried out with the teacher as a collaborator to evaluate the achievement of learning outcomes, after a formative test was carried out in Mathematics learning with the use of PBL strategies (Hutapea, 2020). The evaluation can produce the following reflection: Of the total 38 students, as many as 36 of them successfully completed learning integer operations with a completion percentage of 94.74%. Based on the observation of action II cycle II, it was declared successful with an increase in high completeness . Based on the results of reflections that have been carried out by researchers, researchers take action steps to provide advice and assignments to students so that students are more enthusiastic in teaching and get better results as well (Barr, 2018).

## CONCLUSION

By using the Teams Games Tournament strategy in learning, it can improve student learning outcomes in Mathematics lessons, class IV integer operation material at MIS Hidayatussalam, Jalan Puskesmas, Dusun VII, Bandar Khalipah Village, Percut Sei Tuan District. This is evidenced by After using the Teams Games Tournament (TGT) strategy in grade IV in the Mathematics lesson of Integer material at MIS Hidayatusslam, there was an increase in each cycle. This can be seen in the first cycle obtained an average of 73.94 and there were 21 students or 55.26% who had reached KKM 80 and 17 people or 44.74% who had not reached KKM 80 out of a total of 38 students. Then after the second cycle there was an increase to 94.74% with an average of 85 and there were 36 students who passed KKM 80 out of a total of 38 students.

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