The effect of Joyful Learning Strategies on the results of learning to understand Quadratic Functions.

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Abstract

This research is a Class Action Research (PTK), which aims to improve the mathematics learning results of grade IX students in quadratic function material by using the Joyful Learning Strategy. The subjects in this study were 28 students of grade IX-A SMPN 3 Ngimbang. Data collection techniques in this research include observation, interviews, tests, and documentation. The data obtained in this study have student learning results are taken from giving test questions at the end of the cycle, teacher's ability to manage to learn taken from observation sheets, and student activities taken from student observation sheets. The joyful learning strategy's implementation is carried out in 2 cycles consisting of the planning stage, implementation stage, observation stage, and reflection stage. The precycle research results showed that the average grade score obtained was 26.41%; after being given action in the first cycle using joyful learning, strategies experienced increased learning outcomes with a middle-grade score of 61.11% with students completing as many as 24 students or 85.71%. These results show an increase in student learning outcomes with the implementation of joyful learning strategies.

Keywords: *joyful learning strategies,* learning*,* quadratic functions

Introduction

Mathematics is one of the most important subjects taught at all levels of education, from elementary to secondary school. This is in accordance with Regulation of the Minister of National Education No. 22 of 2006 on Content Standards that mathematics subjects need to be given to all students starting from elementary school to equip students with logical, analytical, systematic, critical, and creative thinking skills, as well as the ability to work together.

Math lessons at junior high school level based on curriculum 2013 presented more material than ever before. The material presented is a little more complicated in general because learning emphasizes more problem-solving efforts. Seeing that, some students think that mathematics is difficult to learn and understand. This results in students becoming lazy to learn and student learning outcomes on low math subjects. One of them is the results of learning mathematics students in grade IX-A SMPN 3 Ngimbang Semester 1 Year Lesson 2019/2020. The results of midterm assessment (PTS) degree IX-A SMPN 3 Ngimbang obtained an average grade score of 51%, while the Minimum CompletedNess Criteria (KKM) that has been determined from the school is 72. Based on the pts results, only 5 students can achieve KKM scores from 28 students.

The observations showed that there were some problems that arise when students are taught quadratic function material. The first problem that arises is the lack of achievement of students' math learning outcomes is the use of learning strategies used by teachers is not appropriate. This is known during the learning process, teachers have implemented a variety of learning strategies, such as one of

which is the strategy of conveying materials using PowerPoin*t* media in the learning process. Still, the strategy has not encouraged some students to be more active and understand the material well, especially materials that emphasize the abstract thinking process, and the atmosphere of learning tends to be passive so that students feel bored in the learning process. The next problem is that students often have difficulty learning materials that contain abstract ways of thinking, such as Squared Function material. This is shown when learning quadratic function materials, and students often experience a decrease in grades because students find it challenging to understand the material.

Based on these problems, one of the efforts that can be done is to use learning strategies that can make students enjoy learning with fun so that they cannot think in abstract situations, such as doing fun activities. The strategy is in accordance with *joyful learning criteria,* which emphasizes the fun learning process. According to Mulyasa (2006: 191-194) stated that *joyful learning* strategy is a learning process in which there is a strong cohesion between educators and learners, without any feeling of force or *depression (not under pressure).* According to Hamruni (2012: 23), the learning process is fun to do, first by arranging an attractive room by fulfilling the element of beauty. Second, through the management of lively and varied learning, namely by using relevant learning patterns and models, media, learning resources, and teacher movements that can raise the motivation of students' learning.

Based on the background of the above problems with the theory and results of research on *joyful learning strategies,* the selection of *joyful learning strategies becomes* the basis for solving problems in order to improve the results of mathematics learning students in grade IX-A SMPN 3 Ngimbang. Based on the background of the above problems, the problem formulation in this study is whether the implementation of a *joyful learning* strategy can improve learning outcomes for grade IX-A students of SMPN 3 Ngimbang?

Research Design

This research is class action research to improve student learning outcomes. According to Aqib et al (2011: 3), class action research (PTK) is research conducted by teachers in their own classrooms through self-reflection with the aim of improving their performance so that students' learning outcomes improve. The model used in this study is based on Kurt Lewin's research model. Kurt Lewin explained that four things must be done in the process of *action research,* namely planning, *implementation of actions (acting), observation (observing),* reflection (*reflecting).*

Planning is At this stage, the activities that must be done are making RPP, preparing facilities from the necessary supporting facilities in the class, preparing instruments to record and analyzing data on the process and actions. *Acting* is At this stage, the researchers perform actions that have been formulated in RPP, in actual situations, which include initial activities, core, and closing. *Observing* is At this stage, what must be done is to observe students who are participating in learning activities. Monitoring discussion activities or cooperation between groups observes each student's understanding of learning materials mastery, which has been designed in accordance with PTK. *Reflecting* is that at this stage, what must be done is to record the observation results, evaluate the observation results, analyze the learning results, and record the weaknesses to be used as the material for drafting the next cycle until the PTK objectives are achieved.

The above stages, which form one cycle, can be continued to the next cycle with plans, actions, observations, and re-reflections based on the previous cycle results. Thus, figure 1 above can be developed into figure 2 (McNiff, 1992: 23). The number of cycles in an action study depends on whether the (main) problem at hand has been solved.

If there is still an unsolved problem, researchers can move into the second cycle by creating a re-action plan based on reflections on the previous cycle. Thus, in this second cycle, there is a revision or modification of the first action plan, according to the field's circumstances. The next steps are relatively the same as the steps presented in the first cycle. So onwards until the problem faced can be solved. Therefore it may take more than three cycles, and it does not matter because the number of cycles is not determined by anything else unless the problem is solved.

Method

Research Settings

The subjects in this study were grade IX-A students of SMPN 3 Ngimbang with a total of 28 students consisting of 14 male students and 14 female students. The research activities were carried out at SMPN 3 Ngimbang in Mathematics subjects of Quadratic Function material. This research was conducted in the odd semester from October 2, 2019, to November 29, 2019, in grade IX-A SMPN 3 Ngimbang.

The Presence of Researchers

In accordance with the qualitative research approach, the presence of researchers in the field is very important and necessary optimally. Researchers are the main key instruments in revealing the meaning and, at the same time, as a data collection tool. Therefore researchers must also be involved in the lives of those studied to the level of openness between the two parties. Researchers as the main instrument in question is the researcher acts as an observer, interviewer, giver of action and data collector as well as the author of the research report. More than that, researchers must know and together with the meticulous so as to understand them from their own point of view.

According to Sudarwan Denim (2001: 121), qualitative research was in the field; researchers mostly dealt with social phenomena or symptoms. Researchers record data into qualitative databases in observing phenomena or events that occur in situations in the field. In this case, a researcher is required to collect as much information as possible related to the focus of the problem studied.

As observers, researchers observed activities that occurred during learning. The main observation points are activities during the learning process, namely the interaction between teachers and students and students. The implementation of observations will be assisted by teachers in the field of mathematics and a colleague.

This is done because the researchers themselves are implementers of the action. With teachers and peers' help, it is expected that no important data will be released from observation. As an interviewer, researchers acted as interviewers on the subject of the study.

As an action giver, researchers act as teachers who create learning plans that are in accordance with *joyful learning strategies,*as well as delivering teaching materials during learning activities. Also, researchers also act as data collectors and analyzers and report the results of actions.

Data and Data Sources

According to Lofland (1984: 47), the main data sources in qualitative research are words and actions, and the rest are additional data such as documents and others. The data collected in the study are as follows;

1 Test results, including the test post at the end of each action, is carried out. The test is an instrument to determine students' learning achievements.
2 Observaton results to observe the activities in the classroom during the learning activities.
3 Intervies conducted on students and teachers related to the learning that has been done.
4 Field notesare detailed notes made by researchers during the study.
5 Questionnaire s the result of a response to student learning activities and research activities during the study with joyful learning stategi.
6 Documentation is a document or photographs of learning activities that take place.

The data sources in this class action study are students in the classroom who are words of students and teachers of grade IX-A homeroom from the learning actions performed.

Data Analysis

According to Suharsimi, Arikunto in conducting data analysis must be adjusted to the approach or design of research. Bodgan and Tylor define data analysis as a process that formally details efforts to find themes and formulate hypotheses (ideas) as suggested by the data as an attempt to provide assistance on those themes and hypotheses.

Data analysis is an effort to systematically search and organize records of observations, interviews, and others to improve researchers' understanding of the cases studied and present as findings

for others. As for improving that understanding, the Analysis needs to be continued by trying to find meaning.

Data analysis in qualitative research is carried out before entering the field, during in the field, and after completion in the field. In this case, Nasution stated, "Analysis has begun since formulating and explaining the problem, before plunging into the field, and continues until the writing of the research results. But in qualitative research, data analysis is more focused during the process in the field along with data collection".

In accordance with the opinions of Miles, M.B & Huberman about what is contained in qualitative Analysis, the data analysis in this research is carried out during and after the collection of data collected in the Analysis with flow model data Analysis, which includes 3 things, namely (1) data reduction (2) presenting data (3) drawing conclusions.

In order to be easier to know the success rate of mulyasa learning said: learning is said to be successful and quality in terms of process if all students or at least most of the 75% of learners are actively involved, both mentally and socially, in the learning process, in addition to showing high learning excitement, great spirit and confidence. While in terms of results are said to be successful and quality in case of positive behavior changes in students entirely or at least most of 75%.

Data Reduction

Reducing Data is the process of selecting, focusing, and simplifying all data that has been obtained, from the beginning of data collection to the preparation of research reports. Test results and transcripts of interview results about students' work on the tests provided, as well as observation notes, may still not be able to provide transparent information. To obtain clear information, data reduction is carried out. Data reduction is made by using selection, focusing attention on simplification, and rough square function to be obtained from interviews, observations, and field notes. This is done with the aim of obtaining clear information from the data, so that researchers can make accountable conclusions.

The reduced Data is the result of a daily replay of the mathematics teacher relating to the Quadratic Function material. Interviews with the principal, mathematics teachers of grade IX-A SMPN 3 Ngimbang and students selected by the researchers, observations on realistic mathematics learning conducted during the administration of actions that took place on the square function material, and field notes conducted by researchers, peers, and math teachers of SMPN 3 Ngimbang n about the things or data that supported the researchers in conducting the research.

Presenting Data

After reducing, the next is to present the data. The presentation of Data is done by narratively compiling a set of information that has been obtained from the result of the reduction, to provide the possibility of drawing conclusions and taking action. The organized Data is then description to get a simple form of respondents so that it is easier for researchers or others interested in the results of the research carried out.

The data presented are Tests, observations, interviews, field notes, questionnaires, documentation conducted at SMPN 3 Ngimbang about the provision of action in an effort to improve understanding of concepts by using *joyful learning strategies*.

The Data that has been presented is then made interpretation and evaluated to make planning the next action. The results of this interpretation and evaluation can be an explanation of (1) the difference between the design and implementation of the action, (2) the need for action changes, (3) alternative actions that are considered appropriate, (4) the perception of researchers, peers and teachers involved in field observation and recording of the activities that have been done, (5) the obstacles faced, and the causes of the constraints arise.

Inference and Verification

According to Miles' conclusion, M.B & Huberman is to provide conclusions on interpretation and evaluation results. This activity includes searching for the meaning of data as well as giving explanations. The verification is the validity of the inferred data. Furthermore, verification activities are carried out, namely testing the truth, robustness, and match of meanings that arise from the data reduced and presented above.

The criteria for the success of this action will be seen from (a) process indicators and (b) indicators of learning outcomes. Indicators of the process set out in this study are if the students' ability to learn the material reaches 75% (enough criticism). The formula used is the same as obtaining the value of success in observation.

Number of scores

Maximum score

Process Average Value (N.R.) =
The level of success of the action:

Table 3.2 Criteria for Action Success

Success Rate	Letter Value	Weights	Predicate
86 – 100 %	A	4	Excellent
76 – 85 %	B	3	Good
60 – 75 %	C	2	Enough
55 – 59 %	D	1	Less
≤ 54 %	E	0	Less Once

As Mulyasa said that: The quality of learning can be in terms of process and in terms of results. In terms of process, learning is known to be successful and quality when entirely or at least most (75%) learners are actively involved, both physically, mentally, and socially in the learning process while showing high learning excitement, a great spirit of learning, and confidence in themselves. The assessment criteria of this learning are as follows:

Table 3.3 Assessment Criteria

Number100	**Number10**	**Predicate**
80-100	8,0-10,0	Very Nice
66-79	6,6-7,9	Good
56-65	5,6-6,5	Enough
40-55	4,0-5,5	Less
30-39	3,0-3,9	Failed

The formula is as follows:

Description:
S : Expected value (searched)
R : The number of scores of items or questions answered correctly
N : The maximum score of the test

Indicators of learning outcomes from this study is if 85% of students have reached a minimum score of 72.

This is based on: "a group or class that is said to be successful (achieving completeness), if at least 85% of the number of students in that group/class has met the criteria for individual accomplishment." While the taking of a score of 75 is the result of discussions with grade IX-A teachers of SMPN 3 Ngimbang and collaborators based on the level of student intelligence and the minimum standards of achievement criteria (KKM) used in the school.

Research

The data collection procedures in this study are as follows.

Test.

The student's work in the test is used to see improved understanding and achievement of student learning achievement. In the study, these tests are are given there are two kinds as follows: a. Pretest, the test given before the action aims to determine the student's understanding of the material to be taught. Pretest has many uses in exploring the learning process to be carried out. Therefore, pretest plays a significant role in the learning process. b. Post-test (final test), which is a test given at the end of each action to determine the students' understanding and the completeness of students' learning on each subject.

Researchers here only use posttests given to students to evaluate learning, in the form of a written test with a description. The test was compiled by researchers and consulted with teachers of the field of study. The test results will show the students' learning skills. Students are considered complete learning when they reach a 75 and above average, and an average of 85; if less than 75 and an average of 85, are regarded as incomplete education, so the student requires special treatment on the next action. Data collection of test post results is carried out at the end of each cycle.

Observation

As a data collection tool, direct observation will make a significant contribution to descriptive research. Certain types of information can be obtained well through direct observation by researchers.

Observations are carried out to observe students and teachers (in this case, researchers) during the classroom's learning activities. This observation was carried out using an observation sheet. Things that need to be observed by observers include students' activity in completing assignments, asking questions, expressing opinions, training in group work, and the ability to communicate work results (presentations).

The researchers carried out observations and assisted by two other observers who were peers because the math teacher had submitted grade IX-A entirely to the researchers. From the observation of learning activities are searched percentage of average value, using the formula

Percentage Average Value (N.R.) =
A = Excellent C = Pretty Good E = Less Once B = Good D = Less good
The criteria for the success of the action can be determined as follows:

Table 3.4 Criteria for Action Success

Success Rate	Letter Value	Weights	Predicate
86 – 100 %	A	4	Excellent
76 – 85 %	B	3	Good
60 – 75 %	C	2	Enough
55 – 59 %	D	1	Less
≤ 54 %	E	0	Less Once

Interview

An interview is a form of communication between two people, involving someone who wants to get information from someone else by asking questions based on a specific purpose.

Interviews are conducted directly with students and teachers in mathematics studies to know the responses of students and teachers about the learning that has taken place. The interview was live because the interview was conducted directly between the interviewer; in this case, the researcher and the interviewee (teacher and student), without going through an intermediary. Students selected as many as three people with criteria, 1 student who obtained the highest grades, 1 student who obtained a moderate grade, and 1 student with the lowest grades.

Field Notes

The main problem in observation is how to remember field data over a long time because it is often impossible to observe while making detailed records and then record in detail in the form of field records.

Field notes contain a summary of all field data collected over a given day or period, compiled based on short notices, diary entries, field logs, and related data derived from documents, records, and records of study and understanding of the social situation in question. This note is compiled as soon as possible after the observation on the day in question is completed so that it is fresh data and does not interfere with the subsequent data collection.

Questionnaire

Questionnaires can *also* be used as a tool to assess learning outcomes. In contrast to interviews where the assessor comes face to face with learners or with other parties, using data collection questionnaires as an assessment of learning results is much more practical, saving time and effort.

The distribution of questionnaires is carried out after the learning process. The dissemination of questionnaires aims to find out the response of students to the learning process carried out. Questionnaires can be in the form of comments (open polls) or questions that have been equipped with answers so that students just choose the one that suits their opinion (closed poll).

This study uses a type of closed questionnaire where the researcher determines the answer; respondents are only asked to choose one of the alternative answers available with their characteristics by giving a cross mark or checklist on the column. The alternative answers used are: Each "yes" answer is given a score of 2, the answer "no" is given a score of 1, and if it does not answer is given a score of 0. Questionnaires are given after the learning activities are completed after the third cycle with the aim of obtaining respondents' data related to student response.

Analysis of polling data is carried out by reviewing each statement. From each statement, a total score of all students is obtained. The average score of each statement is derived from the total score divided by the number of students. To determine a student's response, the following criteria are used:

Table 3.5 Student Response Criteria

Success Rate		Criteria
2,00 – 1,75		Very Positive
1,75 – 1,50		Positive
1,50 – 1,25		Negative
1,25 – 1		Very Negative

1) 2.00 average score > 1.75: Very Positive
2) 1.75 average score > 1.50: Positive
3) 1.50 average score > 1.25: Negative
4) 1.25 average score > 1: Very Negative

Documentation

Documentation comes from the word document, which means written goods. Documentation method means how to collect data by recording existing data. Guba and Lincoln say that forms are any written material or film that is often used for research purposes. Evaluation of learners' progress, development, or learning success can also be completed or enriched by checking the documents. As information about learners' activities in following the learning process is not impossible at certain times is very necessary as a complementary material for educators in evaluating learning outcomes.

Success Indicators

To measure the success of this research the test cycle is carried out. This research is said to be successful if the test results reach three indicators: 1) Learning by applying joyful learning strategies is said to be successful if there is an increase in student learning outcomes by ≥ 75% after being given action. 2) The indicator of success in this study is the achievement of 75% of students getting a score of 60 or more. 3) Mathematics learning is successful if the evaluation value above or equal to 75%.

Research Results

This research begins with observation activities to identify problems that occur in the learning process and as an effort to find solutions. Researchers conducted interviews with teachers and looked at the Midterm Assessment results of grade IX-A students at SMPN 3 Ngimbang to determine the problems that cause poor student learning outcomes. The data showed that the average grade IX-A test results of the odd semester of the 2019/2020 school year had not reached KKM, which was 51% of the 28 students who met the KKM of only five students, judging also from *the observations by pretesting* in grade IX-A with the results seen in Figure 1.

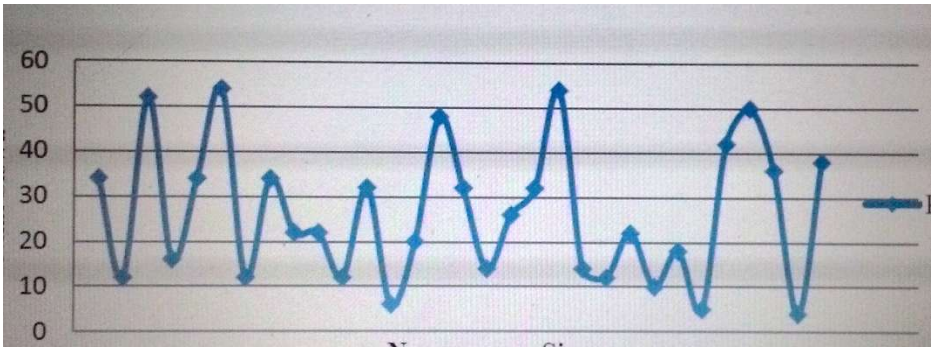

Figure 1. Data and Presylusal Grades of Grade IXA Students

From the data can be seen the learning results of presylusal students through Table 1

Table 1. Pre-Cycle Student Learning Outcomes

Number of Students	Highest Rated	Lowest Value	Grade Mean	Complete Student		Incomplete Students	
				Amount	Percentage	Amount	Percentage
28	65	35	26, 41	0	0	28	100

Based on Table 1 , *pretest results* showed that of the 28 students who fulfilled KKM does not exist because the students have not received the Quadratic Function meter.

The next stage carried out by researchers is the implementation stage of the cycle to achieve indicators of success. The cycle stops when the success indicator is reached. The application of *joyful learning strategies* in class action research consists of four stages, namely:

Planning (Planning)

The initial activities carried out by researchers at this planning stage reflect and analyze the problems that occur in the learning process and look for alternatives to problem-solving. The main activities carried out by researchers in this planning stage are: 1) analyzing the curriculum to know the core competencies and basic competencies as well as the subject matter to be delivered using *joyful learning strategies;* 2) determine the achievement indicators of mathematics learning outcomes of Quadratic Function material by referring to core competencies and basic competencies; 3) create a Learning Implementation Plan (RPP) using *joyful learning strategies;* preparing product worksheets, as an implementation of *joyful learning strategies;* preparing the student evaluation sheet as an assessment of the learning outcomes; making assessment formats and preparing facilities and infrastructure that can support the learning process; compile data collection instruments to be used in class action research is with *pretest sheets, posttests,* and observation sheets.

Implementation of Actions (Acting)

At this stage, researchers apply a *joyful learning* strategy to RPP within two meetings (5 hours lesson). The first meeting begins with a preliminary activity by doing a prayer together, preparing

students to learn and convey learning objectives. The purpose of learning the first meeting of students can explain the meaning of the Quadratic Function and explain the understanding and drawing graph of the quadratic function Y=ax2 and the effect of the value an on the graph Y=ax2.

The next activity is for teachers to start their core activities by implementing learning strategies, namely *joyful learning strategies.* At the *joyful learning* strategy stage, the teacher provides motivation to learn through video. The teacher delivers learning materials associated with daily life with Powerpoint media aids (PPT), wooden ruler props media, and Student Worksheets (LKS). The methods used are lectures, group discussions, assignments, and question and answer questions. Designing the break time and filling it with fun activities. The teacher makes a PPK *pat game,* and students show it; the goal is to not get bored and bored during learning. After *the game* is finished, the students are divided into groups and directed to pay attention to the teacher's explanation of the material identifying the properties of quadratic functions based on their coefficients with wooden ruler props. The teacher's closing activity asks the student about the learning experience and informs the learning that will be learned, and then the teacher closes the lesson with prayer.

The process in the learning activities of the meeting of the two learning objectives, students can explain and draw graphs of quadratic functions Y=ax+c2 and the effect of a value on the graph Y=ax2+c and can apply it to solve the problem. Methods in learning activities are carried out with lectures, group discussions, assignments, and question, and answer questions. The preliminary and concluding activities are similar to the first meeting, which differs from the core activities. In the core activities in accordance with *the stages of joyful learning strategies to* create a comfortable classroom environment, the teacher instructs students to organize benches and chairs into a form of "U," to improve students' understanding, students should pay attention to the teacher's explanation of the material about determining the axis of symmetry and the optimum value of the quadratic function and understand how to draw quadratic function graphs through PPT, Whiteboard, and LKS media. The teacher *gives ice breaking* to make students feel happy in the learning activities; after doing ice breaking, students doing *exercises* related to the material presented at today's activities.

In the next learning activity, students conduct tests to find out the students' abilities after implementing *joyful learning strategies*.

Observation (*Observing*)

The implementation of the learning process with a *joyful learning* strategy is observed and assessed by observers. The assessment results of the filling of observation instruments for the actions of teachers, students, and environmental conditions are presented in Table 2.

Table 2. Data Recapitulation of Observation Results Of Cycle I Observation Result Index

Teacher Learning Observation Index (IPG)	Average Percentage of Each Meeting (%)		Infers	
	I	II	Average (%)	Category
Teacher Learning Observation Index (IPG)	71,36	75	73,18	Good
Student Respos Observation Index (IRS)	81	94	87,5	Excellent
Environmental Condition Observation Index (IKL)	75	85	80	Good

Reflection (*Reflecting*)

Reflection is carried out after observation and action is carried out. At this stage, researchers analyzed the observation results of teacher teaching activities, student response, and environmental conditions to measure the successful implementation of *joyful learning strategies and analyze posttest*

results to find out if there is an increase in learning outcomes of grade IX-A students at SMPN 3 Ngimbang. If the reflection results are not in accordance with the indicators of success, there will be improvements in learning to be carried out in the next cycle.

The result of the value obtained after the action in cycle I using *joyful learning* strategy can be seen in Table 3 below.

Table 3. Student Learning Outcomes Cycle I

Number of Students	Highest Rated	Lowest Value	Grade Mean	Complete Student		Incomplete Students	
				Amount	Percentage	Amount	Percentage
28	90	55	61,11	24	85,71	4	14,28

Based on the results in Table 3 above, it can be seen that the results of mathematics learning in grade IX-A students have achieved indicators of success, there are 24 students who meet the criteria of completeness with a percentage of 85.71% and students who do not meet the criteria of achievement of 4 students with a percentage of 14.28% and obtain an average grade result of 61.11%.

Discussion

Before conducting the research, the results of learning mathematics (precycle) students in grade IX-A SMPN 3 Ngimbang in one class did not meet the KKM score with an average class of 26.41%. In the first cycle, student learning outcomes increased. The increase in student learning outcomes was seen from the number of students who received grades that met the KKM of 24 students with a percentage of 85.71% and the number of students who did not meet the KKM as many as four students with a percentage of 14.28%. The average grade in cycle I increased to 61.11%.

In this study, researchers added learning media that is by PPT and props ruler card the implementation of learning. Figure 2 is a teaching and learning activity in cycle I.

a) Student discussion with group

b) Teacher explained on the board

Figure 2. Teaching and Learning Activities with the Help of Wooden Ruler Props

After the examination started from precycle, I showed that there was an increase in student learning outcomes. The improvement occurred after the implementation of *joyful learning* strategies in mathematics subjects of Quadratic Function material. Here is a diagram image of 4 comparative data of math learning results of grade IX-A students.

Based on comparison data and diagram 4, it can be known that from precycle to cycle I in class action research, students experience changes in learning outcomes, and students can achieve a defined KKM. The average class obtained by grade IX, A students also increased, from precycle 26.41 and cycle I 85.71. As a result of the data obtained, the improvement of mathematics learning outcomes in the Quadratic Function material can be concentrated in Table 4.

Table 4. Data on Improving Math Learning Outcomes for Grade IX-A Students

Value obtained	Pre Cycle	Cycle I
Highest Rated	65	90
Lowest Value	35	55
Achieving KKM	0	24 students
that is ≥ 72	0%	85,71%

Based on Table 4, improvement of mathematics learning outcomes of grade IX-A students above, we can see that students' learning outcomes in mathematics learning quadratic function materials by *implementing joyful learning strategies* from pre cyclical to cycle I increased. Data obtained from the test results showed that students' learning outcomes improved gradually and were quite good compared to implementing *joyful learning strategies.*

Conclusion

The application of joyful learning strategies showed improvement in learning mathematics algebraic materials grade IX-A SMPN 3 Ngimbang. This can be seen the precycle I, wherein precycle no student meets the Minimum Completeness Criteria (KKM), with an average grade score of 26.41. Cycle I increased to 24 students who achieved completeness with an average grade score of 85.71. The first cycle observations obtained an average value of IPG = 73.18% with good categories, IRS = 87.5% with excellent categories, and IKL = 80% with good categories.

Advice

Based on the results of the research that has been done, researchers can conclude suggestions to improve student learning outcomes; for teachers, each lesson should be applied a variety of learning strategies that vary and can make students feel happy in participating in learning activities; improving learning outcomes, interest and motivation for students; for the school can be used as a reference in improving the quality of education in schools and improving facilities in the school environment.

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