IMPROVEMENT OF CRITICAL THINKING ABILITY AND LEARNING INTEREST MATHEMATICS USING MODELS PROBLEM BASED LEARNING ON STUDENT CLASS V SD IT NURUL ILMI PADANG SIDEMPUAN

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Abstract

The purpose of this research is to improve students' critical thinking skills and interest in learning mathematics Class V SD IT Nurul Ilmi Padang Sidempuan. Using the Problem learning model based Learning can improve critical thinking skills and interest in learning mathematics. Improvement from pre cycle, cycle I, and cycle II based on the criteria of critical thinking and completeness of interest in learning. Obtained increased student learning interest, the acquisition of the average grade of the student class increase that is on pre cycle is 51.5, on cycle I increase become 71.2 and in cycle II it increased again to 77.5 during the pre-cycle 13 students (21.6 %) who completed, in cycle I became 29 students (48.3 %) who completed, and on cycle II Also happen enhancement become 46 students (76.7%) Which complete. Meanwhile, students who had not completed the pre-cycle were 47 students (7.83 %) did not complete, in cycle I decreased to 31 students (51.6 %) who did not complete, and on cycle II Also experience decline become 15 students (23.3%) Which No complete. Whereas for ability think critical student show that level students' critical thinking abilities can be seen starting from the pre-cycle and cycle I reached 2 students or 1.67 %, whereas enhancement from cycle I and cycle II reach 9 student or 31.6 %. On level currently obtained enhancement from pre cycle and cycle I as much as 7 person.
or 31.6 %, whereas from cycle I and cycle II experience an increase of 7 (43.3%).

**Keywords**: Problem Based Learning, Critical Think Ability, Learning Interest.

**A. Introduction**

Mathematics is a field of study that is taught at every level education, start from level school base until college tall. Study mathematics is condition Which absolute For enter education to level next. Based on Permendikbud No. 21 of 2016 concerning standard content, wrong one competency to be achieved in Mathematics learning content at the level basic education is to show a positive attitude to mathematics: logical, careful and thorough, honest, responsible, and not easily give up in solving problems, as a form of implementation of habits in inquiry and exploration of mathematics, as well Have curiosity, enthusiasm for continuing learning, self-confidence, and interest on Mathematics through learning experiences (Asriningtyas, 2018).

Learning in the classroom should be done by the teacher by facilitating And create process learning Which pleasant, due to process the very influential on the interest in learning that students achieve later. one of the models learning mathematics realistic is presenting problem mathematics in life daily, Because in a manner No direct will help student in think face problem mathematical in life daily. Learning the ideal is student-centered learning and confronts students on everyday mathematical problems thereby learning. With the hope of students can be interested in learning mathematics, moreover mathematics is a subject Which important and useful for students (Kemdikbud, 2021).

The 2013 curriculum has begun to be applied to education in Indonesia today. The 2013 curriculum is designed to answer the needs of
In this modern era, involvement of students in the learning process takes precedence over learning. Along with developments, eyes lesson Mathematics separated from the Integrated Thematic book for grades 4, 5, and 6 of Elementary School. Mathematics is a language of symbols. It is a science based on thinking logical, critical, creative, innovative, and consistent own object objective abstract, that is fact, draft, operation, and principle (Niat, Yakin, Bornok Sinaga, Hotmika Sihombing, 2017).

One of the abilities that need to be developed in learning mathematics is the ability to think critically in finishing or solving problems (Asrori, A., & Suparman, 2019). Richard And Paull defines critical thinking as something that is the ability and disposition to evaluate in a manner critical something trust or faith, assumption What Which underlying And on base view life where assumption the located. This opinion is reinforced by Stobaugh (2013: 2) Which explain that think critical is think Which reflective in a manner deep in taking decision And solving problem to analyze situations, evaluate arguments, and draw appropriate conclusions. People who are able to think critically are people who are able to conclude what is he knows, know method use information For solve problem, And capable look for sources information Which relevant as problem solving support. Based on the explanation above, Skills think critical is ability For analyze, solve problem, And evaluate opinion Alone Where That need discipline, thinking Which deep And logical.

Thinking ability critical need developed to every student. Importance think critical For every student that is so that student can solve all problems that exist in in world real. Think critical is ability somebody in getting information And solving of a problem with how to
ask himself. Alone for dig information about problem which currently faced. Matter the due in process learning, student will question various information which accepted and use ability he thought for analyze and evaluate problem the with use reason logical (Hayati, Lu’lul, Inyoman Loka, 2019).

In fact objective mathematics so that student capable think logical, analytical, systematic, critical, and creative as well as the ability to cooperate is still far from expectations. Results observation of researchers and interviews on 22 September 2022 to teachers on learning in class V SD IT Nurul Ilmi Padang Sidempuan found the problem that no exists response which given student against what delivered Teacher. For example moment Teacher explain, student only follow step the teacher without question the reasons taking step the. Besides that, no none of the students for try look for step other which more easy in finish problem p which same happened when Teacher give question story. Almost all student wait Teacher for change question story into the form model mathematics and only a number of student who tried for continue it in determine the solution. Things the show that student no in a manner active understand, analyze and evaluate what delivered Teacher good in delivery material as well as solving problem. The results of the initial data on the level of competence interest in learning with KKM 70 it turns out that only 13 students (21.6%) have achieved it KKM. Whereas 47 student (78.3%) not yet reach KKM or with say other ability think critical students are still low.

Seeing such conditions, researchers seek to improve learning in order to improve thinking skills critical and interest in learning mathematics. Rusmono (Rusmono, 2014: 74) mention that characteristics mathematics which objective or everyday events and deductive in
nature, namely theories or statements mathematics can be accepted for truth, then PBL is the model needed to push happening process learning with interest to learn Which optimal for development all potential child (Cristina, 2016). According to hamdayana (2014: 215) explain that the problem-based learning model can interpreted as Suite activity learning that emphasizes on process settlement problem Which faced in a manner scientific. There is three characteristic main model learning based problem ie (1) learning model based problem is Suite activity learning. PBM No expect student only just listen, take notes, then memorize the material lesson, however through PBM student active think, communicate, look for And process data, And Finally conclude. (2) Activity learning directed For finish problem (3) Solving problem done with use method scientific (A, 2016).

Wardoyo (2013: 74) said that the PBL model demands activity students fully in order to solve any problems that arise faced student in a manner independent by constructing knowledge and understanding Which owned. Results study (Asriningtyas, Kristin, & Anugraheni, 2018), Also shows that the use of Problem Based Learning learning models can improve critical thinking skills and interest in learning in solving problems story on eye lesson mathematics.

B. Method

Research this is Classroom action research implemented in SD IT Nurul Ilmi Padang Sidempuan. The full address is Jl. HT Rizal Nurdin No. 5, Silandit, Padang Sidempuan, City of Padang Sidimpuan, North Sumatra 22711. Study will be held in February 2023. subject study is student class V SD IT Nurul Ilmi Padang Sidempuan with a total of 60 children with spread 30 child man and 30 child Woman (Sugiyono, 2015).
There are two variables in this study, namely the dependent variable and the independent variable. Variable tied to this research is the ability to think critically and interest in learning (Sugiyono, 2017). Whereas the independent variable in this study is the Problem-based Learning model (PBL). Model learning Problem-based Learning is something model learning which base learning on a problem as well as teach student about higher-order thinking and finding a solution to a problem (J. W Creswell, 2014).

As for the syntax of the PBL model according to Fathurrohman (2015: 116) is

Stage 1: Orient students to problems.
Stage 2: Organizing students to learn.
Stage 3: Guide investigation individual nor group.
Stage 4: Develop and present the work.
Stage 5: Analyze and evaluate process solving problem.

In study This, researchers use models channel study class act from Kemmis and Taggart, that is shaped spiral from cycle Which One to cycle Which next. Every cycle covers planning (plan), action (action), observation (observation), and reflection (reflection). Step in the next cycle is planning revised, actions, observations, and reflections. Before enter on cycle 1 done action introduction Which form identification problem (John W Creswell, 2012). The amount cycle no can have confirmed, because concerns solving problems in the class under study. For example, if in one or two cycle problem Which There is Already can overcome so research may be terminated, however If in One or two cycle problem Not yet can resolved so proceed to the third cycle and so on. Second cycle and so on held with revise factors Which considered able to
The instrument in this study was a test item consisting of 10 descriptive questions previously tested the validity, reliability, and level of difficulty of the questions (Hanum, 2013). Grain instrument question used for know so far where success student to learning and as a comparison the increase in critical thinking skills and student learning interest between cycles which will be given at the end of each learning activity cycle. Observation sheets are used to observe teacher and student activities during process learning going on from beginning until end learning. Sheet observation filled by observer with give sign tick on indicator evaluation Teacher And student (Trianto, 2009).

Analysis data done after activity taking data done. After data
obtained so data grouped in two part. Part First load data form number or called data quantitative and part second containing data Which form words or symbol Which called with data qualitative. Data quantitative will analyzed using Microsoft Excel. Whereas data qualitative will analyzed use technique analysis data qualitative, in where with technique This researcher will describe the data in a manner descriptive (using an explanation in the form of words). In this study using technique analysis quantitative descriptive at a time descriptive qualitative(Arikunto Suharsimi, 2013). Analysis descriptive quantitative will used For process data which is obtained from questions test Which given to student. Analysis Qualitative descriptive will be used to process data from observation.

Forget mark on ability think critical student with using the Problem-based Learning model used the formula below This:

\[ N = \frac{a}{b} \times 100\% \]

Information:
N= Mark ability think critical mathematics
a = Total score obtained on all indicators
b = Total ideal score of all indicator

C. Finding and Discussion

Before he did action study on Semester II Year Lesson 2018/2019 in Mathematics class V at SD IT Nurul Ilmi Padang Sidempuan, the researcher first formerly do observation on activity pre cycle with objective For see condition beginning student before implemented action through model learning Problem-based Learning . On activity implement pre cycle researcher organize pre test on eye lesson mathematics material
get up room especially formerly, based on results pre test results from mark ability think critical mathematics a number of students 60, there are 8 students who have the ability to think critically tall, whereas 1 2 student own ability think critical currently And 38 students own ability think critical low. For more he explained can seen on table 1 in below

**Table 1.** Value Ability Think Critical Student Class V Pre Cycle

<table>
<thead>
<tr>
<th>No</th>
<th>Critical Think Ability</th>
<th>Student Amount</th>
<th>Percentage Pre Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High</td>
<td>8</td>
<td>13.3 %</td>
</tr>
<tr>
<td>2</td>
<td>Medium</td>
<td>12</td>
<td>20 %</td>
</tr>
<tr>
<td>3</td>
<td>Low</td>
<td>38</td>
<td>63.3 %</td>
</tr>
</tbody>
</table>

Based on table 1, it can be seen that the critical thinking ability is the pre-cycle value students who have critical thinking skills with a high category totaled 8 students or 13.3 % of the total number of students, while students moderate category amount 12 student or 20% of the total number of students, And thinking ability critical with low category amounted to 38 students or 63.3% of the total student. From the value of critical thinking skills before action and discussion together with class V teacher it can be concluded that class V students of SD IT Nurul Ilmi Padang Sidempuan level of thinking critical in mathematics is still low, it is necessary to take action as an effort to improve critical thinking using the Problem learning model based Learning. Whereas for interest in learning can see from table following.

**Table 2.** Completeness Interest to learn Mathematics Student Class V Pre Cycle

<table>
<thead>
<tr>
<th>No.</th>
<th>Standard Completeness</th>
<th>Amount Student</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mark</td>
<td>Information</td>
<td></td>
</tr>
</tbody>
</table>

[167]
Table 2 above shows the comparison of students who achieve learning mastery or fulfill KKM ≥ 70 is as many as 13 students or (2.16%) while students who do not achieve complete learning as much 47 students (7.83%), with highest score 78 and lowest score 10.

**Analysis Enhancement Ability Think Critical in Learning Mathematics**

Based on the actions that have been carried out by researchers, on the results of the action through model learning *Problem-based Learning* (PBL) for increase critical thinking skills in learning mathematics students' geometric material grade V SD IT Nurul Ilmi Padang Sidempuan in semester II of the 2022/2023 academic year can be seen results the increase in the table:

**Table 3. Analysis of the Results of Critical Thinking Ability in Learning Mathematics Student Class IV SD IT Nurul Ilmi Padang Sidempuan Semester II Year Teachings of 2022/2023**

<table>
<thead>
<tr>
<th>No</th>
<th>Information Think Critical</th>
<th>Pre Cycle</th>
<th>Cycle I</th>
<th>Cycle II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount student</td>
<td>%</td>
<td>Amount student</td>
<td>%</td>
</tr>
<tr>
<td>1.</td>
<td>High</td>
<td>8</td>
<td>13.3%</td>
<td>10</td>
</tr>
<tr>
<td>2.</td>
<td>Medium</td>
<td>12</td>
<td>20%</td>
<td>19</td>
</tr>
<tr>
<td>3.</td>
<td>Low</td>
<td>38</td>
<td>63.3%</td>
<td>31</td>
</tr>
</tbody>
</table>

Amount 60 100% 60 100% 60 100%

On Table 3 show that level of critical thinking skills Shiva can Look Starting from the Pre Cycle there are 8 students who have high critical thinking skills or 13.3% of the total, 12 students have moderate critical [168]
thinking skills or 20% of the total, 38 students have low critical thinking skills or 63.3% of the total. While in cycle I there were 10 students who have high critical thinking skills or 16.7% of the total, 19 students have ability critical thinking currently or 31.6% from total number. 31 students have low critical thinking skills or 51.6% of the total. Whereas in cycle II there is 19 students Which have ability critical thinking high or 31.6% of the total, 26 students have the ability to think critically moderate or 43.3% of the total. 15 students have the ability to think critically low or 25% from amount whole.

Based on results study Which has done, obtained enhancement high-level critical thinking skills from pre-cycle and cycle I reached 2 students or 16.7%, whereas enhancement from cycle I and cycle II reach 9 student or 31.6%. On level currently obtained enhancement from pre cycle and cycle I as much as 7 person or 31.6%, whereas from cycle I and cycle II experience an increase of 7 people rose to 43.3%.

Comparison of critical thinking skills of pre-students cycle, cycle I, cycle II can in Look in diagram following:
Analysis Completeness And Comparative Analysis Interest to learn Student

Based on the results of the actions that have been taken there is an increase in learning interest students through the Problem-based Learning (PBL) learning model in subjects Mathematics with the subject of building volume for class V students at SD IT Nurul Ilmi Padang Sidempuan in Semester II of the 2022/2023 academic year. The following is an analysis of the completeness of interest in learning student pre cycle, cycle I and cycles II can see on table following This.

[170]
Table 4. Comparative Analysis of Completeness Interest in learning Mathematics Student Class V S D IT Nurul Ilmi Semester II Year Lesson 2022/2023

<table>
<thead>
<tr>
<th>No.</th>
<th>Completeness</th>
<th>Pre Cycle</th>
<th>Cycle I</th>
<th>Cycle II</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>f</td>
<td>%</td>
<td>F</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>Complete</td>
<td>13</td>
<td>21.6%</td>
<td>29</td>
</tr>
<tr>
<td>2</td>
<td>Not Complete</td>
<td>47</td>
<td>78.3%</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>51.5</td>
<td>71.2%</td>
<td>77.5</td>
</tr>
<tr>
<td></td>
<td>Maximum</td>
<td>76</td>
<td>90</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td>10</td>
<td>24</td>
<td>48</td>
</tr>
</tbody>
</table>

Table 4 above shows that the level of completeness of students' learning interest from the start pre-cycle to cycle II has increased. During the pre-cycle there is 13 students (21.6%) who completed, in cycle I became 29 students (48.3%) who completed, and on cycle II also happen enhancement become 46 students (76.7%) which complete. Meanwhile, students who had not completed the pre-cycle were 47 students (78.3%) did not complete, in cycle I decreased to 31 students (51.6%) who did not complete, and on cycle II also experience decline become 15 students (23.3%) which No complete. From results which obtained is known that application model learning Problem-based Learning (PBL) succeed. Matter This strengthened from diagrams following:
The diagram above shows that many students achieve completeness in pre-cycle to cycle II has increased. In pre-cycle to cycle I the increase from 13 student become 29 student or as much 16 students (26.7%) increased, from cycle I to cycle II from 29 students to 46 students or as many as 17 students (28.3%) experience enhancement. Comparison percentage amount completeness interest in learning Mathematics in the pre-cycle, cycle I, and cycle II can be seen in the picture following:

Apart from the acquisition of student interest in learning which increases the acquisition of the average value flat class student Also increase that is on pre cycle is 51.5 on cycle I increase become 71,2 and on cycle II increase Again become 77,5. Results the average student acquisition can also be seen in the graphic image comparison below This.
Based on results analysis study Where researcher use model learning Problem-based Learning (PBL) Where model This emphasize on problem life daily, researcher try apply it on process learning with the help of media that can be used by students in learning. On every meeting researcher try to apply _ every syntax PBL Which covers 5 stage. Steps the applied on 2 cycle Which where every cycle consists from 3-time meeting. Based on the steps of the PBL learning model, it is able to improve ability think critical student, Because in a manner No direct student trained For solve something question in real life (Primayana, 2019).

At the beginning of the meeting the researcher found it difficult to implement the steps PBL because students still tend to be busy or busy alone so it is not interesting enthusiastic student in Study (Seranica, Christinsenia, Agus Abhi Purwoko, 2018). But researcher A little by A little capable do approach to both individual and group students, involving students in the use of media is also very influential where it can foster
courage students to argue or provide feedback. Organizing students in the group is also very influential because it determines the group will work in a manner maximum or Not.

The use of the PBL learning model also improves thinking skills students' critical thinking, based on the results of research analysis that has been carried out in cycles I and cycle II obtained results that happen ability improvement think critical student class V SD IT Nurul Ilmi Padang Sidempuan when follow lessons. Activities This requires deep, disciplined, and logical thinking in order to produce the right decision. It is hoped that by increasing students' critical thinking skills can increase ability in finish question mathematics (Usmaedi, 2017).

In this study, not only did students' critical thinking skills increase, but also interest to learn mathematics student experience enhancement, matter This obtained based on results analysis study Which Already done, enhancement That happen from pre cycle, cycle I and cycle II. During the pre-cycle there is 13 students (21.6%) who completed, in cycle I became 29 students (48.3%) who completed, and on cycle II Also happen enhancement become 46 students (76.7%) Which complete. Meanwhile, students who had not completed the pre-cycle were 47 students (78.3%) did not complete, in cycle I decreased to 31 students (51.6%) who did not complete, and on cycle II Also experience decline become 15 students (23.3%) Which Nocomplete. From results Which obtained it is known that the application of the Problem-based Learning (PBL) learning model is deep Mathematics learning is successful because it has experienced an increase.

This research in accordance with opinion Mita (Puspita, Slameto, & Setyaningtyas, 2018) Which states that the Problem-based Learning model can increase interest in learning Mathematics student.
Study This the more complete and strengthen study earlier which done by Anastasia (2018), with title "Application Model Learning Problem Based Learning to Improve Ability Critical Thinking and interest in learning Mathematics for Grade 4 Elementary School Students. The research results show that use model learning Problem based Learning can increase critical thinking skills and interest in learning in solving word problems in the eye lesson mathematics in class 4 SD Country Order 01. It can prove from increasing ability think critical student from condition beginning (pre-cycle) that is 60,82 (No critical) become 74.21 (enough critical) on final condition cycle II. Enhancement Also happen on interest to learn student from mark the average interest in learning in the initial conditions of 61.85 increased in cycle I to 69 and in cycle II to 80. Percentage the number of students Which reach KKM increase from condition beginning 44.84%, increase to 69.44% in the evaluation cycle I and to 88.89% on evaluation cycle II. Matter This showing Model PBL effective for increase ability think critical and interest in learning mathematics.

So can concluded that application model learning Problem based Learning (PBL) help box black white can increase interest to learn And solving skills math problem.

D. Conclusion

Based on the results of research and discussion, it can be concluded that Mathematics learning using the PBL learning model can improve ability think critical And interest to learn Mathematics student class V SD IT Nurul Ilmi Padang Sidempuan. This is evidenced by an increase from the pre-cycle, cycle I, and cycle II based on the criteria of critical thinking and completeness of interest in learning. Obtained
increased student learning interest, the acquisition of the average grade of the student class increase that is on pre cycle is 51.5, on cycle I increase become 71.2 and in cycle II it increased again to 77.5 during the pre-cycle 13 students (21.6%) who completed, in cycle I became 29 students (48.3%) who completed, and on cycle II Also happen enhancement become 46 student (76.7%) Which complete. Meanwhile, students who had not completed the pre-cycle were 47 students (7.8.3%) did not complete, in cycle I decreased to 31 students (51.6%) who did not complete, And on cycle II Also experience decline become 15 student (23,3%) Which Not Complete.

Whereas For ability think critical student show that level students' critical thinking abilities can be seen starting from the pre-cycle and cycle I reached 2 students or 16,7, whereas enhancement from cycle I And cycle II reach 9 student or 31.6%. On level currently obtained enhancement from pre cycle And cycle I as much as 7 person or 31.6 %, whereas from cycle I And cycle II experience an increase of 7 people rose to 43.3%.

Bibliography


