

Efforts to Improve Student Activities and Results in Integrated Learning Using the Problem Based Learning Model at SDN 060924 District Sanding Field

Aswan Simanjuntak ^{1*)}, Hidayat ²⁾

^{1,2} Muslim University Al Washliyah University, Medan, Indonesia
Emails: ¹⁾ aswansimanjuntak@umn.ac.id, hidayat@umn.ac.id ²⁾

Article history: received July 11, 2023; July revised 24, 2023; accepted July 29, 2023
this article is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/)



abstract . This study aims to determine efforts to increase student activity and learning outcomes in learning multiplication with integers using the problem-based learning model at SDN 060924, Medan Amplas District. This research is a classroom action research. The model used in this study is the Spiral model from Kemmis & Mc Taggart. This research was conducted in May 2023 at SDN 060924 Medan Amplas . In this study using a test instrument, namely multiple choice questions as many as 15 questions and non-tes , namely in the form of observation sheets, interviews, and documentation. There are several types of data collection techniques, namely tests, observations, and documentation. Based on the table about the development of student learning activities above, it shows an increase in student learning activities. In this case, the average increase in student learning activity in each aspect is 11.345% and all aspects of the activity reach the active criteria. Learning mathematics about integer material in cycles I, II and III that the application of problem based learning has in fact experienced an increase of 90% from the number of students who complete it in cycles I, II and III, the description of student learning activities regarding multiplication of integers increases greatly Good. It is known that the mastery of the mathematics learning results of class IV students on mixed arithmetic operations material reaches 90%, so that it meets the specified indicator of 70%. So in this case the researcher can be said to be successful and there is no need for further action in the next cycle. Observations from observers showed an increase in student activity in participating in learning.

Keywords: Activity, Multiplication of Integers, Problem Based Learning

I. INTRODUCTION

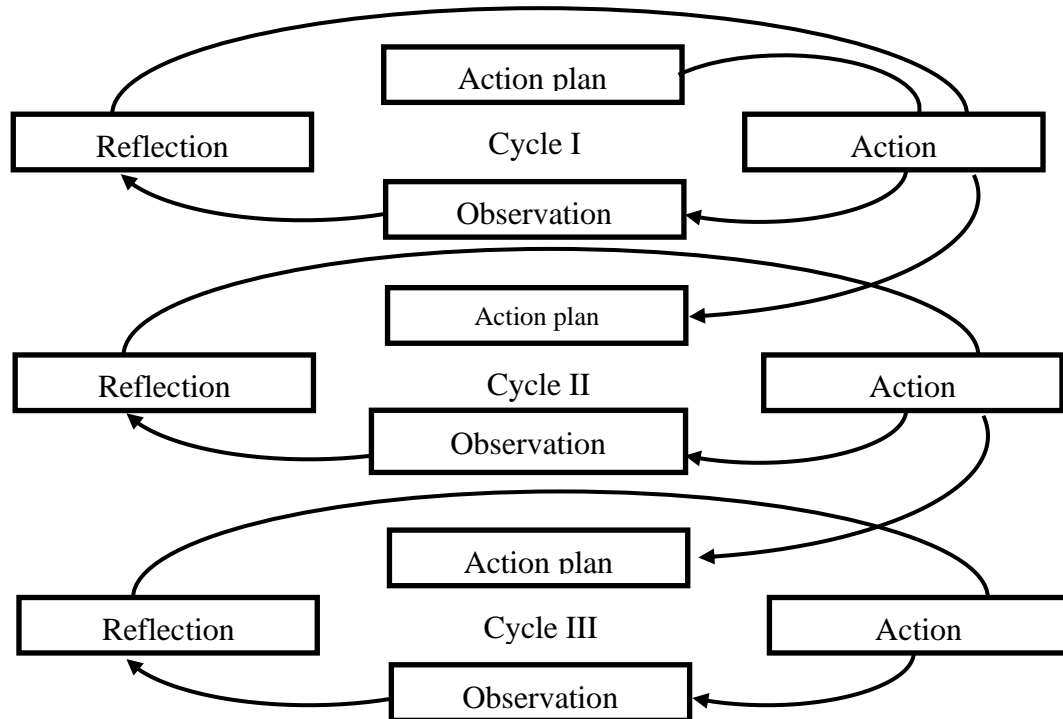
Education is one of the things that humans require. As well as obligatory obligations fulfilled by everyone human and every nation for realizing a good and developed country while gaining understanding and ability to operate functions of appropriate importance with its nature, besides That development, more life is Good from One period to the next. Quality learning mamathematica can be seen in facet process quality and quality result. In terms of student process quality, students still tend to be passive in the learning process of multiplication number rounds, while students expected can be actively involved in the learning process. Besides that, students expected can control

the material being taught. In terms of quality, results can be seen from performance studies or the completeness achieved by students. To achieve an optimal learning outcome, it is necessary to plan a strategy for a goal learning multiplication number round with the Problem Based Learning model. So from that, we need a purposeful strategy to form knowledge and educate participants in the learning process. Researchers do observation in class IV SD Negeri 060924 Medan Sandpaper. Based on observation during research at SDN 060924 Medan Amplas District, mastery of math in class IV, especially on the material multiplication number round, Still belongs low. Besides that, there are lots of students who don't understand multiplication number round, so that students have difficulty reaching results in their studies. As for the solution that researchers do to finish the problem, this is to apply the *problem-based learning* model to the material multiplication number expected round when implementing the model, so activity and results for students can increase.

II. METHODS

Research Design

Study This is Classroom Action research . Models used in study This namely the Spiral model from Kemmis & Mc Taggart



1) Draft Cycle I

a. Action Plan

In plan action this , researcher Act as executor action and collaborate with the fourth grade teacher in matter This Act as observer at the time learning going on .

b. Action Implementation

Researcher carry out learning based on scenario in plan implementation learning (RPP) that has been There is with guidance from the class teacher .

2) Draft Cycle II

a. Action Plan

Cycle II and cycles furthermore done if the results achieved in cycle I are felt Not yet fulfil criteria success that has set

b. Action Implementation

Researcher carry out learning based on scenario in plan implementation learning (RPP) that has been There is with guidance from the class teacher .

3) Draft Cycle III

a. Action Plan

In plan action this , researcher Act as executor action and collaborate with the fourth grade teacher in matter This Act as observer at the time learning going on .

b. Action Implementation

Researcher carry out learning based on scenario in plan implementation learning (RPP) that has been There is with guidance from the class teacher .

Instrument Study

Instrument study is tool aid used for measure variable with objective For obtain data (Sugiyono, 2009). Suharsimi Arikunto (2006) states that the research instrument is tool help For obtain data. In research This use instrument test that is question choice double as many as 15 questions and nontes that is form sheet observation , interview , and documentation .

1. Observation

2. Test

3. Documentation

Validity Test

validity instrument can checked with use a number of evidence . The evidence mentioned above also includes validity content , validity contents , by construct , or known with validity construct , and in . Focus placed on how specifically results calculation consistent with the intended definition . The definition lowered from theory . If definition the has enter theory with right and questions or his statement accordingly , then instrument the considered legitimate from corner view validity construction .

Formula correlation Product *Moment* used like served under this :

$$r_{xy} = \frac{n(\sum xi^2yi) - (\sum xi)(\sum yi)}{\sqrt{(n(\sum xi^2) - (\sum xi)^2)(n(\sum yi^2) - (\sum yi)^2)}}$$

r_{xy} = coefficient correlation *Product Moments*
 n = Amount respondent
 Xi = score each item on the experiment First

Reliability Test

A number of reliability test tool that can used are test-retest, equivalent , and internal consistency . own internal consistency own a number of different test techniques . The internal consistency method consists from the halved test , KR 20, KR 21, and Cronbach's Alpha test . (Syamsuryadin & Wahyuniati, 2017: 15)

$$r_{11} = \frac{2r_b}{1 + r_b}$$

r_i = internal reliability of all instruments
 r_b = Product Moment correlation between cleavage odd with cleavage even (Syamsuryadin & Wahyuniati, 2017: 9)

Difficulty Level Test

kindly general can said that level hardship is level easy or nope something questions given to the group student . Difficulty level can counted with formula :

For count level hardship each grain question used equation :

$$P = \frac{B}{J}$$

With P is index difficulty , B is many students who answered question with true , and J_x is amount whole student participant test .

Table 1. Difficulty Level

Difficulty Range	Difficulty Level Category
0.00 - 0.29	Hard
0.30-0.69	Currently
0.70-1.00	Easy

Discriminating Power Test

differentiating power (DB) is ability grain THB (Learning Outcome Test) questions differentiate students who have ability high and low . Analysis Power differentiator This aim For know ability question in differentiate belonging students capable (high achievement) with belonging students weak achievements (Sudjana 2012: 141).

Table 2. Criteria for Discriminating Power

Index Discrimination (DB)	Criteria
0.70-1.00	<i>Items</i> very good question , can accepted .
0.40-0.69	Question <i>items</i> Enough fine , got accepted with repair .
0.20 – 0.39	Medium <i>items</i> , necessary discussion , usually need fixed and be target repair .
0.00-0.19	Bad <i>item</i> , rejected or discarded and replaced with other <i>items</i> .

Data Collection Techniques

Data collection techniques exist a number of type that is tests , observations , and documentation . Deep data collection techniques study This that is use test observation , interview and documentation .

Data analysis technique

Enhancement ability Multiplication number round student start in aspect cognitive through *Problem-Based Learning* models will said increase if in the observation process seen significant change from results use of *Problem Based Learning* models child on

cycle First to cycle next . According to Ngalim Purwanto (FratyaPuspita Devi 2014) Observation results analyzed with use analysis percentage with formula namely :

$$P = \frac{f}{N} \times 100\%$$

Description :

P = Results Observation

f = Raw score obtained student

N = Maximum score (Amriani et al., n.d.)

Table 3. Criteria Percentage Activity Study

No	Criteria	Percentage
1	Very Good	76% - 100%
2	Good	51% - 75%
3	Enough	26% - 50%
4	Not enough	0% - 25%

For count percentage completeness Study used formula as following :

$$p = \frac{\sum \text{siswa yang tuntas belajar}}{\sum \text{siswa}} \times 100\%$$

Description :

$\sum x$ = Amount completed students Study

N = Total whole student

Table 4. Criteria Percentage Learning Outcomes

Criteria results Study	It means
90%-100%	Very high
80%-89%	Tall
65%-79%	Currently
55%-64%	Low
0%-54%	Very Low

III. RESULTS ANDDISCUSSION

CYCLE I

The results of the analysis in the first cycle consisting from meetings 1 and 2, got concluded that teacher performance and results Study student in learning Already fine , but need enhancement in matter activity Study student . this need followed up with cycle II for repair deficiencies that occur in cycle I can look from table give me this :

Lack	Reason Lack	Strength	Cause of Strength
Less Increase results study and activity Study student	Less teachers in give question	Master more often give question	For dig opinion from student because the teacher often give question For interesting attention student
Lack of motivation student motivation student in Study	Less teachers in give motivation to student	Teachers need give motivation student	For increase activity during the learning process . Teacher must become Friend For students so they can motivating students for more Spirit Again Study
Lack of concentrate and listen instruction from the teacher	Master more toward learning lecture	Direct student For more concentrate and listen instruction from the teacher to the learning process walk effective	For student can control material with more Good with use learning problem based learning

Lack of deep teacher friendliness activity learning	Less teachers in give smile at the diligent student ask	Give strengthening form picture smile	For student more brave go ahead and believe self every time it appears forward general with use method learning quantum learning
Lack of gift prizes to students for more Spirit Again in follow learning	Less teachers in give present	Give gift or rewards to students so that they are more Spirit	Give present ppada students for more student experience enhancement in results Study

Cycle II

The results of the analysis in the second cycle consisting from meetings 1 and 2, and 3 can be concluded that teacher performance and results Study student in learning Already fine , but need enhancement in matter activity Study student. This need followed up with cycle III for repair deficiencies that occur in cycle II can look from table give me:

Lack	Reason Lack	Strength	Cause of Strength
increasing results study and activity Study student	Rising Master in give question	Master more often give question	For dig opinion from student because the teacher often give question For interesting attention student
increasing motivation student in Study	Rising Master in give motivation to student	Teachers need give motivation student	For increase activity during the learning process . Teacher must become Friend For students so they can motivating students for more Spirit Again Study
increasing concentrate and listen instruction from the teacher	Increased Master toward learning lecture	Direct student more concentrate and listen instruction from the teacher so that the learning process walk effective	For student can control material with more Good with use learning problem based learning
increasing deep teacher friendliness activity learning	Rising Master in give smile at the diligent student ask	Give strengthening form picture smile	For student more brave go ahead and believe self every time it appears forward general with use method learning quantum learning
Already increasing gift prizes to students for more Spirit Again in follow learning	Rising Master in give present	Give gift or rewards to students so that they are more Spirit	Give present ppada students for more student experience enhancement in results Study

CYCLE III

Based on learning that has implemented, results Study student class IV semester II in the lesson mamathematica about multiplication number round Already increase with indicator completeness 90% up to Already reach indicator completeness already determined ie 70KKM All student Already have reached KKM determined.

Discussion

Based on results test cycles I, II, and III conducted by researchers For student obtained data results activity Study student mathematics about material multiplication number round before done action learning that is as following :

Table 5. Observation Results Activity Student Cycle I, II and III

No	Observed aspect	Cycle			Enhancement
		Average Cycle I	Average Cycle II	Average Cycle II	
1	Student pro - actively answer question from the teacher	65.02	75.65	79.03	11.45
2	Student own courage in surfaced right opinion	62,93	72.2	78.02	10.87
3	Student active in follow learning	66,30	73.75	79.06	10.35
4	Pro active students in solve a question test number already round assigned	64.34	75.05	80.06	12.34
5	Student willing and able discuss with the group a	63,76	75.65	79.08	11.89
6	Student complete a task in accordance with time that has determined	64,16	76.30	78.3	12,14
7	Student brave present enjoy results Work the group .	58,76	71.28	82.05	12.54
Average		64.68	71.74	79,106	11,345

Based on table about development activity Study student above , pointed out happen enhancement activity Study student . In case this is the average increase activity Study student in every aspect of 11,345% and all aspect activity reach criteria active . This means indicator success in study This Already reached . For more clarify enhancement development activity Study students , got seen on the chart following :

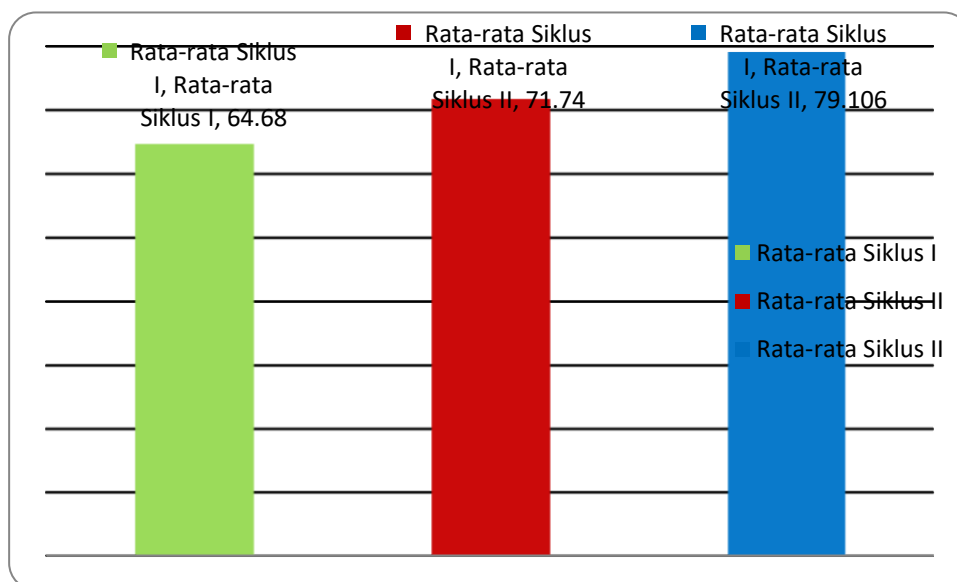


Figure 1. Chart Development activity Study student Cycles I, II and III

Learning Outcomes Mathematics Multiplication Integer Cycles I , II, and III

Based on results test evaluation conducted by researchers for student from Cycles I, II and III obtained data results Study mathematics about material multiplication number round can known this show that results Study mathematics very less students . Can seen from the following table:

Table 5. Distribution Frequency of Learning Outcomes Mathematics Cycle I,II , and III

No	Score	Cycle		
		Cycle I	Cycle II	Cycle III
1	>90	75%	80%	90%
2	<90	19%	20%	25%

For more clarify the data on so will served in form diagram picture . 4.3

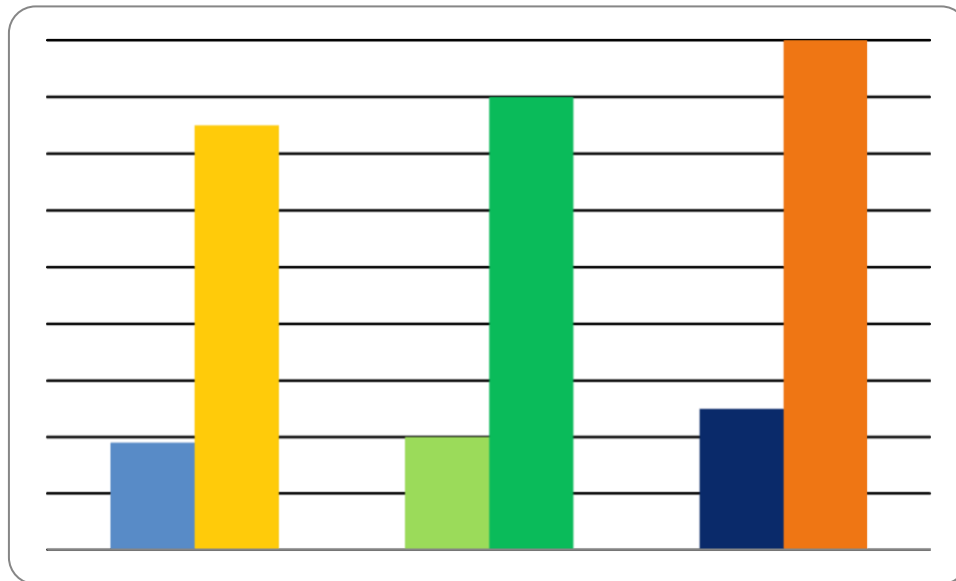


Figure 1. Learning Outcome Completeness Diagram Mathematics Cycle I, II, and III

Learning mathematics about material number round in cycles I, II and III that application of problem based learning turns out Already experience 90% increase of amount students who pass in cycles I, II, and III then description activity Study student about material multiplication number round increase very well.

Based on results research conducted in cycles I, II, and III that use of *Problem Based Learning* models so that can increase activity and results learn on multiplication number round in eye lesson mathematics class IV SDN 060924 Medan Amplas District. is known that completeness results bela mathematics student class IV material operation count mixture reach 90%, so Already fulfil specified indicator i.e. 70%. So deep matter This researcher Already can said it worked and it did No need Again held cycle action next.

IV. CONCLUSIONS

Based on results research conducted for Increase Activities and Learning Outcomes Students in Learning Multiplication Integer Using the Problem Based Learning Model in Medan Amplas District Sdn 060924 in cycles I, II, and III that using the Problem Based Learning model so that can increase activity and results learn on multiplication number round in eye lesson mamathematica class IV SDN 060924 Medan Amplas District . is known that completeness results bela mamathematica student class IV material operation count mixture reach 90%, so Already fulfil specified indicator i.e. 70%. So deep matter This researcher Already can said it worked and it did No need Again held cycle action next.

Observation results from the observer shows exists enhancement activity student in follow learning . Students who have ability above other friends play a role as a peer tutor. Whereas less students No reluctant and not Embarrassed For ask to other friends and to the teacher. It 's just Still Not yet student brave For do question in a manner individual up front class . For That need given motivation again so students feel like For do assignment given by the teacher. Reflection Based on analysis depicted in Figure 4.2 and results observation from the observer shows that completeness Study student is 81% so Already in accordance with indicator completeness already determined i.e. 70 Activeness students too almost maximum but Not yet all student brave do task in a manner individual . Then activities research in cycle II is necessary held cycle improvements next that is cycle III.

ACKNOWLEDGEMENTS

1. Special family beloved , To My parents are always give prayer and support to writer .
2. Mr. Dr. Hardi Mulyono K. Surbakti , SE, M.AP as Chancellor of the Muslim Nusantara University Al- Washliyah along with the Vice Chancellor .
3. Mr. Dr. Samsul Bahri, M.Sc as dean Faculty Teacher Training and Education at the Muslim Nusantara University Al- Washliyah .
4. Mrs. Dr. Sukmawarti , S.Pd. , M.Pd, as Head of Elementary School Teacher Education Study Program
5. Drs. Hidayat, M.Ed as mentor script that has to spare time and effort in give guidance with full persistence and patience .
6. Mr and Mrs lecturer as well as all administrative staff in the Faculty Teacher Training and Education at the Muslim Nusantara University Al- Washliyah .
7. Head School along with the teachers and students of SD Negeri 060924 Medan Sandpaper who have help complete the research data this .

REFERENCES

- Alisa, Y., Yennita , Y., & Irawati, S. (2017). Enhancement Activities and Learning Outcomes Student Junior high school Using a Problem Based Learning Model. *Diklabio : Journal of Education and Learning Biology* , 1(1), 113–120. <https://doi.org/10.33369/diklabio.1.1.113-120>
- Amriani, R., Makassar, UM, Makassar, UN, & Makassar, UM (nd). Used Materials in Group B Islamic Kindergarten.
- Andani , M., Pranata, OH, & Hamdu, G. (2021). Systematic Literature Review: Problem Based Learning Models in Learning Mamathematica Elementary School . *PEDADIDAKTIKA: Journal Elementary School Teacher Education Sciences* , 8(2), 404–417. <http://ejournal.upi.edu/index.php/pedadidaktika/index>
- Ariana, R. (2016). Increase activity participant educate in learning mamathematica with concrete media class III SDN 16 SAHEK. 1–23.
- Eberl, K., Wegscheider, W., Abstreiter , G., Cerva, H., & Oppolzer , H. (1991). Symmetry properties of short period (001) Si/Ge superlattices. *Superlattices and Microstructures*, 9(1), 31–33. [https://doi.org/10.1016/0749-6036\(91\)90087-8](https://doi.org/10.1016/0749-6036(91)90087-8)
- Eskri , Y. (2021). Meta Analysis The Effect of Discovery Learning and Problem Based Learning Models on Ability think Critical Participant educate Grade V SD. 2(February), 6.
- Gaol , RL, & Simarmata , EJ (2019). The Effectiveness of Mathematics Teaching Materials Based Elementary School Culture Local Through Application of the Contextual Teaching and Learning (CTL) Learning Model to Activity Study student . *Proceedings of Faculty National Seminar Knowledge Medan State University*, 3(4), 1032–1035.
- Musyadad , VF, Supriatna , A., & Parsa, SM (2019). Application of Problem Based Learning Learning Models in Improving Learning Outcomes Students In Science Lessons On Concepts Change Environment Physical and Influence To Mainland . *Journal Tahsinia (Journal Public And Scholarly Works)*, 1(1), 1–13.
- Nisaul 'Azmi Hajar, AY Djoko Darmono, ACB (2016). Application of the Problem Based Learning (PBL) Learning Model for Improving Learning Outcomes Student Class X-3 in Sociology Subject, *KEBAKKRAMAT State High School, 2015/2016 ACADEMIC YEAR*. 1–23.
- Paloloang , MFB (2014). Application of the Problem Based Learning (PBL) Model for Improving Learning Outcomes Students on the Material of the Length of the Common Tangent of Two Circles in Class VIII of SMP Negeri 19 Palu. *Journal Mathematical Education Electronics Tadulako* , 2(1), 69–82.
- Rosidah , R., Wasonowati , T., Redjeki , T. *, Sri, D., & Ariani, RD (2014). Application of the Problem Based Learning (Pbl) Model in Learning Law - Basic Law of Chemistry in terms of learning activities and results Student Class X IP Surakarta State Senior High School 2 2013/2014 Academic Year . *Journal of Chemistry Education*, 3(3), 66–75. <https://jurnal.fkip.uns.ac.id/index.php/kimia/article/view/4244>
- Shiwei , AN, Sanmin , WAN, & Xiaojian, LI (2017). Application of the Problem Based Learning Model for Improving Mathematics Learning Outcomes About Multiplication and Division Fractions in Students Grade V SDN 1 TAMANWINANGUN 2016/2017 ACADEMIC YEAR. 4(2), 1676–1683.
- Shoimah , RN (2020). Use of Learning Media concrete For Increase activity Learning And Understanding Draft Mathematics Subject Fractions Student Class Iii Mi Ma'Arif Nu Sukodadi-Lamongan . *MIDA : Journal of Islamic Basic Education*, 3(1), 1–18. <https://doi.org/10.52166/mida.v3i1.1836>
- Silvi, F., Witaras , R., & Ananda, R. (2020). Literature Review about Ability Solving Problem Mamathematica with the Problem Based Learning Model for Students Elementary School . *Tambusai Journal of Education* , 4(3), 3360–3368. <https://www.jptam.org/index.php/jptam/article/view/851%0Ahttps://jptam.org/index.php/jptam/article/view/851>
- Suratman, A., Rakhmasari , R., & Apyaman , D. (2019). The Effect of Learning Models ICT -Based Against Learning Outcomes Mathematics and Motivation Study Mamathematica student . *Journal of Analysis*, 5(1), 41–50.

- SUSWATI, U. (2021). Application of Problem Based Learning (PBL) Improves Chemistry Learning Outcomes . *TEACHING : Journal Innovation Teacher Training and Education* , 1(3), 127–136. <https://doi.org/10.51878/teaching.v1i3.444>
- Suwarsih, S. (2018). Improving Learning Outcomes Student About Multiplication and Mosharafa : *Journal of Mathematics Education Semester I in lessons Mamathematica Mosharafa : Journal of Mathematics Education* . 7(September), 433–444.
- Syamsuryadin , S., & Wahyuniati , CFS (2017). Knowledge Level Volleyball Coach About Mental Training Programs in Sleman Regency , Yogyakarta. *Jorpres (Journal Sport Performance)* , 13(1), 53–59. <https://doi.org/10.21831/jorpres.v13i1.12884>
- Widodo, & Widayanti , L. (2014). Enhancement Activity Learning and Learning Outcomes Student with the Problem Based Learning Method for Students Class VIIA MTs Negeri Donomulyo Kulon Progo 2012/2013 Academic Year . *Journal Indonesian Physics* , 17(49), 32–35. <https://doi.org/10.22146/jfi.24410>
- Yusuf, NR, Bektiarso , S., & Sudarti , S. (2020). Effect of the PBL Model With Google Classroom Media Against Activities and Learning Outcomes student . *ORBITA: Journal of Study, Innovation and Application of Physics Education* , 6(2), 230. <https://doi.org/10.31764/orbita.v6i2.3043>
- “PDCA12-70 data sheet,” Opto Speed SA, Mezzovico, Switzerland.
- A Karnik, “Performance of TCP congestion control with rate feedback: TCP/ABR and rate adaptive TCP/IP ,” M. Eng. thesis, Indian Institute of Science, Bangalore, India, Jan. 1999.
- J. Padhye, V. Firoiu , and D. Towsley , “A stochastic model of TCP Reno congestion avoidance and control,” Union v . of Massachusetts, amherst, MA, CMPSCI Tech . Rep. 99-02, 1999.
- W i r eless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specification* , IEEE Std. 802.11 , 1997.

