



THE EFFECT OF PROBLEM BASED LEARNING MODELS AND LEARNING MOTIVATION ON LEARNING OUTCOMES AND PROBLEM SOLVING ABILITY IN ANIMAL LIFE CYCLE MATERIAL AT SD NEGERI 174581 SIPAHUTAR

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Abstract

Objective this research is to find out influence in a manner simultaneously, the influence of problem based learning model and motivation Study to results learning and ability solving problem students at SDN 174581 Sipahutar. This research is study experiment pseudo. Research data collected with test ability solving students and tests results learn science students. As for the amount sample in this research is 45 students with boys 26 and girls 19. Testing hypothesis done with use analysis manova. Research results show that, (1) exists influence application of the learning model based problem to results Study student. (2) There is the influence of problem based learning model to ability solving problem students at SDN 174581 Sipahutar. (3) There is the influence of motivational models Study to results Study students on the material cycle life animal. (4) There is influence motivation Study to ability solving problem student.

Keywords: *Problem Based Learning, Motivation Learning, Learning Outcomes, Ability Solving Problem*

A. Introduction

Ability solving problem is one ability important thing to do owned student. Because in life daily everyone always faced with various must problem resolved and used creativity to be able to find solution from problems they face (Kelana, 2019). Ability solving problem practice student find. Along various draft in a manner holistic, meaningful, authentic as well as applicable (Handayani, 2020). Gok and Silay (2010) stated that ability solving problem seen as very fundamental learning science. Science (IPA) is branch studying science about regularity nature, dominate knowledge, fine facts, concepts, principles, discovery processes and attitudes scientific (Fitrianiingtyas, Anggraini, 2017).

Learning science is not only understand concept, however emphasize patterns think students to be able master and solve problem in a manner critical, logical, thorough and thorough (Khalida, 2021). Ability solving problem is very important part in science learning, because activity solve problem demand student find. Along concepts in learning so the learning process more mean. Mariawan (2013) also stated that ability solving problem is aspect important in learning science, because solving problem used to teach student in apply knowledge acquired knowledge and skills in learning. Ability solving problem give experience direct to student so that can add ability student in construct, understand and apply concept that has studied student (Pratiwi, S. N., C. Cari, 2019).

Based on matter that, if in the science learning process, students get used to develop ability think level high then ability solving student science problems become more ok. The reality that happened in the field, students Still experience difficulty in define and solve related problems with material science learning. This is because Still Lots the only student memorize concept and less capable use draft the. If find problem in

related life with concept possessed, even student not enough capable determine problem and formulate it (Trianto, 2009).

Besides that low ability solving problem students are also proven from low score obtained Indonesian students in follow TIMSS test (Trends International Mathematics and Science). Based on results TIMSS research that measures level knowledge student from just know facts, concepts and use them to solve simple problem until necessary problem reasoning high. Result of TIMSS research in 2011, the score obtained by Indonesia was 406 which is score smallest number five, while in 2015 Indonesia obtained score of 397 which is smallest number four from 64 countries. Score obtained placing Indonesia in the title of Low Science Benchmark (Primayana, 2019).

Based on predicate obtained by Indonesia in TIMSS 2011 and 2015 Indonesian students only own a number of knowledge base about biology, chemistry, physics and science. Student Not yet capable demonstrate and deliver knowledge biology, chemistry, physics and natural science in various context. Students are also lacking capable communicate and explain draft related with biology, chemistry, physics and IPA in life daily Good in a manner practical, abstract nor experiment (Fiteriani et al., 2021).

The low ability solving problem student in science lessons caused by many factor. Factors that can trigger low ability solving problem student Can originate from in self students (internal) and can from environment (external). Internal factors that can influential to ability solving problem student such as attitudes, talents, interests and motivation self students who are still less, meanwhile factor external can cause low ability solving problem student is role educator (teacher). The role of the teacher can influence ability solving problem student is no

teacher's precision in choose the learning model used during the learning process in class. The problems that occur in activity learning is contained in the use of learning models used by educators not enough effective and less grow democratic learning, so needed innovation in learning with apply learning models that can grow motivation study and participants educate get results maximum learning specifically in eye science lessons. Efforts that can repair atmosphere effective learning, so more involve participant educate in activity learning going on that is through problem based learning model. The goal is to get increase Skills participant teach to work same, grow Skills think critical, and capable solve problems in life everyday, in particular in science learning. because it, to shove capabilities that have owned by the participants learn, it is necessary application of learning models that produce work based problem to raise motivation learning and results Study participant educate through solving problems that occur in life everyday. Problem based learning model is something approach learning to use problem in life daily as something context for participant educate to learn about method think critical skills solving problem, and to acquire knowledge as well as draft from material lessons delivered.

Solution to solve problem related weak ability solving problem the is with apply a capable learning model involve participant educate in a manner active and contributing in the learning process in class so that ability solving student science problems more improvement and learning process more mean. One of the innovative models that can increase ability solving problem student is a problem based learning (PBL) model. The PBL model has five components, viz orientation students on the problem, organize students to learn, guide individual or group (Pamungkas Aji, Bambang Subali, 2017), developing and presenting results

works and analyze and evaluate the solving process problem. Excess of the PBL model is one model that can bridge gap between reality daily student with what happened in class (Asriningtyas, 2018).

PBL models also work awaken interest learn and build ability intellectual student. Hassan revealed that PBL can increase understanding student to learned material, abilities solve problems and skills apply concept. Wheelers argued that PBL can practice prowess think level tall students, so with the application of the power PBL model remember student to learning become more permanent Because student find Alone answer on problem he found. Based on description it is necessary done study more carry on about the effect of the PBL model on ability solving science problem students who will also have an effect on results Study student (Asrori, A., & Suparman, 2019). This research was conducted to find out influence learning based problem and motivation Study to results learning and ability solving problem eye student science lessons especially on material cycle life animal.

B. Method

Viewed from focus problems and relationships between the variables involved in research , this research includes in category study experiment use posttest only control group design (Sugiyono, 2017). Variable in this research namely: learning based problem and motivation Study as variable free, ability solving problem and result learn science as variable bound. Population and sample in this research namely there are 45 students school base at SDN 174581 Where of the 2 existing classes everything stated same after equivalent test was carried out. Sample in this research is taken in a manner random (random sampling). In this

study two classes taken as sample that is class A as class experiment and class B as class control (Purwanto, 2017).

Instrument research used in this research is shaped instrument test to measure ability solving problem students, and test choice double is used to measure results learn science students. Before done study especially formerly tested the validity and reliability instrument with SPSS-PC 20.0 for Windows help (Arifin, 2017). After done calculation validity question with use correlation product moment obtained 19 items question declared valid and 3 points question invalid. Reliability test ability solving problem is 0.84 with very high criteria. Based on results validity and reliability test ability solving problem, out of 22 questions 19 items were selected question to know ability solving problem student. Validity test results science learning conducted on students with 55 respondents with 30 grains question. After done calculation validity question with use correlation product moment obtained 30 items question declared valid. Reliability results learn science students is 0.98 with very high criteria. Based on results validity and reliability results learn science students, from 30 questions selected 30 items question to know results learn science students (Sugiyono, 2015).

hypothesis in this research, namely:

1. Exists influence application of problem based learning model to ability Solving students' science problems on the material cycle life animal.
2. There is influence motivation Study to ability Solving students' science problems on the material cycle life animal,
3. There is influence application of problem based learning model to results learn science students on the material cycle life animal.
4. There is influence motivation Study to results learn science students on the material cycle life animal.

To test hypotheses 1.2 and 3 using the T test – Sample model test Independent test. Whereas hypothesis 4 in this study used Manova with analysis Pillai Trace, Wilk Lambda, Hotelling Trace, Roy's Largest Root (John W Creswell, 2012). Analysis results show price F more small of 0.05 means significant data. So there is influence ability think critical thinking, motivation and results learn science between students who get treatment and students who do not. To analyze the data in this study uses SPSS 20.0 For Windows (J. W Creswell, 2014).

C. Finding and Discussion

Research result

Referring to the prerequisite test results, namely the normality and homogeneity tests variant can conclude that data from all group originate from normally distributed data and has the same variance or homogeneous. results that all data is normally distributed. Research results show data as following

Table 1. Recapitulation of Ability Score Calculation Results solving problems and Student Science Learning Outcomes

Group Statistics	Ability Solving Problem Experiment n	Ability Solving Problem Control	Results Study Experiment n	Results Study Control
N	45	45	45	45
Means	71.8333	64,6667	77.0000	81,5333
Median	71.5000	65,0000	80,0000	81,0000
mode	71.00 a.m	54.00	85.00	77.00
Standard Deviation	5.01091	7.54450	7.61124	4.27288
Range	18.00	23.00	20.00	14.00
Minimum	2155.00	1940.00	2310.00	2446.00
Maximum	81.00	77.00	85.00	89.00
Maximum	81.00	77.00	85.00	89.00

Referring on table 1, looked that average ability solving problem on problem based learning is 71.83 more tall compared to students who follow learning conventional with an average of 64.67. As for results learn science students using models learning based problem has an average of 77.00 more small from results Study IPA use learning conventional is 81.53.

For test hypothesis 1 in study This use test levene model Independent sample test that is obtained coefficient F as big 6,546 with significance 0.013 and value t_{count} of 4,334. If set significance 0.05, value significance Far more small from 0.05. With thus H_0 is rejected and H_1 is accepted. With Thus H_0 is rejected and H_1 is accepted, So there is influence between models learning based problem with ability solving problem.

Testing hypothesis 2 in This study uses the Levene Independent model test samples that is obtained F coefficient of 5,341 with significance of 0.024 and mark t_{count} of 4,704. If set significance 0.05, value significance Far more small from 0.05. With so H_0 rejected and H_1 accepted. With thereby H_0 rejected and H_1 accepted, So there is influence between problem based learning model with results learn science students.

For test hypothesis 3 in study This use test levene model Independent sample test that is obtained coefficient F of 18,648 with significance 0.001 And mark t_{count} as big 2,845 If set significance 0.05, mark significance Far more small from 0.05. With so H_0 rejected and H_1 accepted. With so H_0 rejected and H_1 accepted, So there is influence between motivation Study to results Ability solving problem student.

For test hypothesis 4 in study This use test levene model Independent sample test that is obtained coefficient F of 16,678 with

significance 0.001 And mark t_{count} as big 2,845 If set significance 0.05, mark significance Far more small from 0.05. With so H_0 rejected and H_1 accepted. With so H_0 rejected and H_1 accepted, so there is influence between motivation Study to results learn science students.

Testing to hypothesis show that there is significant influence between student Which get treatment model learning based problem to ability solving problem student. Matter This can see from mark F of 5,341 with significance of 0.013 more small from significance 0.05. Besides that, analysis descriptive data show that ability solving problem student class that experiment Study with problem based learning model categorized Enough Good that is with flat score 71.83, whereas ability think critical student Which follow the learning model conventional have an average score of 64.67 Still categorized Enough ok. Student Which get treatment model learning based problem own average value as much as 26.67% meanwhile students who follow the learning model conventional as much as 16.67%. There is significant relationship between ability solving problem students who get problem based learning model show that this learning model very good for applied by Teacher in progress Study teach in class.

Objective learning based problem is “help student develop ability think, solve problem, skill intellectual, study about various adult role through engagement they in experience real or simulation, and be independent learning ”. (Primayana, 2019) In learning based problem, before start the learning process teach inside class , student especially formerly asked to observe something phenomenon. Then student asked to take notes the problems that arise. After that, teacher's job is stimulating students to think critical in solve something existing problem. The teacher's job is direct different perspective with them.

Study This relevant with results study by Sadia, et al, Ida Good Purwata, Lilik Farida (2010) Research the identify that there is influence model learning based problem to ability solving problem.

Testing to hypothesis show that there is significant influence between student Which get treatment model learning based problem to results learn science students. It can see from F value of 2,845 with significance of 0.000 more small from significance 0.05. Besides that, descriptive data analysis show that results learn science students class learning experiment with problem based learning model categorized Enough Good that is on average score 77.00 meanwhile results learn social studies students who follow the learning model conventional have flat score as big 81.53 categorized Good. Student Which get treatment model learning based problem own mark flat as much 56.67% whereas student Which follow model learning conventional as much 33.33%. In activity learning or activity instructional, usually educator set objective learn. Student Which succeed in Study is Which succeed reach objective learning (Pamungkas Aji, Bambang Subali, 2017).

Every learning process teach success be measured from how much Far results Study achieved participant learn, besides be measured from facet process, It means how much Far type results Study owned participant students (Arikunto Suharsimi, 2013). Good bad results can see from results measurement in the form of evaluation, besides measure results learn, evaluation can also be aimed at knowing the learning process and activity participant educate in follow learning, so should results Study Which obtained participant educate. can know and have in accordance with goals that have been formulated. (Nursamsu, 2020)

Results Study IPA Integrated educator should use process learning Which has set by plan learning as well as gather data and information

Which in accordance with standard competence and competence base eye lesson IPA. Results study This in line with results study Which done by Farida (2010), that model Study based on problem can increase motivation Study students and activities Study students who more Good compared to with models teaching direct.

Testing to hypothesis show that there is significant influence between motivation Study to ability solving problem. Viewed from test results levene model Independent sample test that is obtained coefficient F of 18,648 with significance 0.001 And mark t_{count} as big 2,845 If set significance 0.05, mark significance Far more small from 0.05. With so H_0 rejected and H_1 accepted. From teh result we know that H_0 rejected and H_1 accepted, So there is influence between motivation Study to results Ability solving problem student (Asriningtyas, 2018).

Testing to hypothesis show that there is significant influence between motivation Study to ability solving problem. Viewed from test results levene model Independent sample test that is obtained coefficient F of 16,678 with significance 0.001 And mark t_{count} as big 2,845 If set significance 0.05, mark significance Far more small from 0.05. With so H_0 rejected and H_1 accepted. From the results, H_0 rejected and H_1 accepted, So there is influence between motivation Study to results learn science students.

D. Conclusion

Based on results testing hypothesis And discussion so can formulated conclusion as following:

1. There is influence application of problem based learning model to ability solving problem ipa students on the material cycle life animal,
2. There is influence motivation Study to ability solving problem ipa students on the material cycle life animal,

3. There is influence application of problem based learning model to results Study ipa students on the material cycle life animal.
4. There is influence motivation Study to results Study ipa students on the material cycle life animal.

Based on conclusion study Which has exposed, so can filed a number of advice as following:

1. For teachers can recommended use learning based problem For increase ability solving problem and result study science.
2. For student For reach motivation achievement And results Study in learning science, implementation learning based problem recommended use real issues and problems the packed.
3. For respectively respectively unit education recommended For apply learning based problem in carry out the learning process to get maximum results.

Bibliography

- Arifin, Z. (2017). Evaluasi Pembelajaran. Remaja Rosdakarya.
- Arikunto Suharsimi. (2013). Dasar-dasar evaluasi pendidikan. Bumi Aksara.
- Asriningtyas, A. (2018). Penerapan Model Pembelajaran Problem Based Learning Untuk Meningkatkan Kemampuan Berpikir Kritis Dan Minat belajar Matematika Siswa Kelas 4 Sd. JIPMat, 3(1).
- Asrori, A., & Suparman, S. (2019). Analisis Kebutuhan E-LKPD Sesuai Model Problem Based Learning Untuk Meningkatkan Kemampuan Berpikir Kreatif. Prosiding Sendika, 5(1), 1–10.
- Creswell, J. W. (2014). Research Design: Qualitative, Quantitative and Mixed Methods App roaches (4th ed.). Thousand Oaks. SAGE.
- Creswell, John W. (2012). Planning, conducting, evaluating, quantitative and qualitative research (Fourth Edition). Educational Research.
- Fiteriani, I., Ningsih, N. K., Irwandani*, I., Santi, K., & Romlah, R. (2021). Media Poster dengan Pendekatan Etnosains: Pengembangan Bahan Ajar IPA Siswa Sekolah Dasar. Jurnal Pendidikan Sains

- Indonesia, 9(4), 540–554.
<https://doi.org/10.24815/jpsi.v9i4.20984>
- Fitrianingtyas, Anggraini, and A. H. R. (2017). Peningkatan Hasil Belajar IPA Melalui Model Discovery Learning Siswa Kelas Iv SDN Gedanganak 02. *Mitra Pendidikan*, 1(6), 708.
- Handayani. (2020). Peningkatan Motivasi Belajar IPA Melalui Model Pembelajaran Project Based Learning pada Masa Pandemi Covid-19 bagi Siswa SMP Negeri 4 Gunungsari. *Jurnal Paedagogy*, 7(3), 168–174.
- Kelana, J. B. (2019). *Bahan Ajar IPA Berbasis Sains* (1st ed.). Lekkas.
- Khalida, B. . & A. (2021). Penerapan Metode Eksperimen Untuk Meningkatkan Hasil Belajar IPA Siswa Kelas VI SD. *Jurnal Ilmiah Pendidikan Profesi Guru*, 4(2), 182–189.
- Nursamsu. (2020). Analisis Kelayakan dan Kepraktisan Modul Pratikum Berbasis Literasi Sains untuk Pembelajaran IPA. *Jurnal IPA Dan Pembelajaran IPA*, 4(1), 30.
- Pamungkas Aji, Bambang Subali, and S. L. (2017). Implementasi Model Pembelajaran IPA Berbasis Kearifan Lokal Untuk Meningkatkan Kreativitas Dan Hasil Belajar Siswa. *Jurnal Inovasi Pendidikan IPA*, 3(2), 118. <https://doi.org/10.21831/jipi.v3i2.14562>.
- Pratiwi, S. N., C. Cari, and N. S. A. (2019). Pembelajaran IPA Abad 21 Dengan Literasi Sains Siswa. *Jurnal Materi Dan Pembelajaran Fisika*, 1(9), 34–42.
- Primayana, K. H. (2019). Menciptakan Pembelajaran Berbasis Pemecahan Masalah Dengan Berorientasi Pembentukan Karakter Untuk Mencapai Tujuan Higher Order Thingking Skilss (HOTS) Pada Anak Sekolah Dasar. *Purwadita: Jurnal Agama Dan Budaya*, 3(2), 85–92. <http://jurnal.stahnpukuturan.ac.id/index.php/Purwadita>
- Purwanto. (2017). *Evaluasi Hasil Belajar*. Pustaka Belajar.
- Sugiyono. (2015). *Metode Penelitian dan pengembangan*. Alfabeta.
- Sugiyono. (2017). *Metode Penelitian Kuantitatif, kualitatif dan R&D*. Alfabeta.
- Trianto. (2009). *Mendesain Model Pembelajaran Inovatif-progresif, Konsep, Landasan, dan Implementasinya pada kurikulum tingkat satuan pendidikan*. Kencana Pranamedia.