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Influence of Problem Based Learning Models (PBL) and Learning Motivation to Learn Outcomes and Student's Critical Thinking Skills Themes of Caring for Life in Class IV Primary School No 026609 Pujidadi Binjai

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Abstract

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The results obtained from this study include the learning outcomes of students in the experimental class and control class, the students' critical thinking skills in the experimental class and the control class as well as the observation data of students' learning motivation on the theme of caring for living beings in grade IV Elementary School 026609 Pujidadi Binjai in the 2019 academic year. / 2020. shows that the average score of learning motivation in the experimental class is 82.20 with a standard deviation of 6.823 and the average score of learning motivation in the control class is 45.23 with a standard deviation of 1.007. Furthermore, the results of the students' learning motivation scores between the experimental class and the control class are combined then the median is sought. This process is carried out to divide motivation into two groups, namely the high motivation group with the criteria of students with a motivation score above the middle value (median) and the low motivation group with the criteria of students with a motivation score below the middle value. As for the calculation, the median value is 63.71. The research method used is Quasi Experimental Quasi (Quasi Experimental Method) with the research design as the basis for the implementation of the research is to distinguish the effect of problem-based learning models and the effect of expository learning on student outcomes and critical thinking skills in science in terms of high learning motivation and low learning motivation. the treatment class is class V1 class V2.

Keywords

learning; motivation;
student's critical;
problem based
learning



I. Introduction

Education is a process of development, formation, and guidance practice training for humans through appropriate guidance and guidance throughout his life. Based on the law No. 20 year 2003 on the national education system stated that Indonesia Republic education functions promote competences and build the character and civilization of the Indonesia nation dignified so that educating the nation's life. Education purposed to promote the inner potential of learners to shape personality as believers and fear God Almighty, have a noble character, are welfare, knowledgeable, competent, industrious, independent, and a democratic citizen as well as accountable (BSNP, 2011: 39).

Education is mostly significance in the context of changing and development of the Indonesian nation for the better. Referred to the opinion of Trianto (2011: 1) "Education that is able to support future development is education that is able to develop the potential of students, so that they are able to face and solve life problems they face".

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II. Review of Literatures

Education aims to make students happy and make the lives of students better in the future and to reach happiness in the world and the hereafter based on faith, knowledge, and charity. One of the strikes to build the educational quality is through upgrading the teaching and learning procedure, which manifests a series of teacher and student steps on the basis of mutual symbiosis relationships that occur in educational atmosfers to reach certain objectives in the learning process. Realizing these educational goals, the most important thing is how to foster children's personality and diversity.

According to Amri (2010: 51) that "Education does not expect human beings who become alienated from their community, but through education it is hoped that they can better understand and be able to develop the lives of their people". Therefore, the goals, substance, and procedure of education have to be in accordance with the necessities, conditions, attributes, welfare and developments of society. In coaching and improving to achieve educational goals an important role is the role of school teachers. School is the second place in a student's life. Schools are formal educational institutions that have a systematic program in carrying out guidance, teaching and training to children (students) so that they develop according to their potential.

Learning according to Rusman (2012: 1) could be described as a system, which contains of variety of components that are interconnected with one another. Those components can be proposed here such as goals, substances, model, and assessment. The four components have to be judged by the teacher in selecting and deciding the instruction model applied. Selection of the right learning model can have a positive impact on student mastery of the subject matter being taught and student learning outcomes. According to Fred (in Djamarah 2006: 61) he has conducted research on 3,725 students in the United States. From the results of his research states that, "If you use good methods and good media in teaching and learning activities, it will get good learning outcomes".

According to Sitorus (2020) Learning management strategies are very important in the overall learning strategy system. However the planning of the organizing strategy and the learning delivery strategy are good, but if the management strategy is not considered, the effectiveness of learning.

Referred to the findings of observations of the averagely UAS score at SD 026609 Pujidadi Binjai for 2020, it showed that the averagely acquisition of student studying outcomes is still low below the KKM determined by the school as indicated on Table 1.

Table 1. Value of Students' Natural Science Semester Exam Results Class IV Elementary School 026609 Pujidadi Binjai

No	Class	Students Completed	Not complete	Percentage
1	V1	13	8	62%
2	V2	15	6	71%
amount		28	14	67%

Referring to Arsani (2020), learning was essentially a cognitive happening that has the motivation of psychomotor functions. Low studying output and learner's critical thinking abilities are also affected by low learner motivation. The importance of intrinsic motivation in the studying procedure for it can rise and promotes the enthusiasm of learners in studying. Uno (2008: 29) states that "one of the most influential variables on learning outcomes is

student characteristics including the level of learning motivation". Generally many peoples have already accepted that motivation is viewed as individual's driving force to take action or to do a behavior. If learners is lack of intrinsic motivation, then it needs outside/external motivation, such as extrinsic motivation so learners are motivated to learn. In accordance with Wulandari (2020), instruction motivation can explain the procedures, that can bring up and encourage behavior, give direction and meaning of behavior and can decide whether good or not good in reaching goals so that the greater the intrinsic motivation will be greater learning success. In order to the basic competencies and instruction goals that are hoped to be reached properly, a scientific instruction model is needed. This model is intended to provide learning experiences to learners so that learners can build their own knowledge so that the knowledge lasts a long time in the minds of students. One model that is able to cover all these characteristics is the PBL model..

Referring to Simanjuntak (2020) The educator was mostly significant factor in establishing the success of the instruction procedure, that is why the educator must be able to stimulate learner instruction motivation so that learners play an proactive role in the studying procedure so that they are hoped to obtain best quality education.

Referred to the limitation of the problems that have been stated above, the problems of this research are able to be stated on the following: (1) Is there an effect of the problem-based studying model on learners science instruction findings with the theme of caring for human life? (2) Is there a motivational effect on student science learning outcomes on the theme of Concern for Living Beings? (3) Is there an interaction between the influence of the studying model and motivation on students' science instruction output in the Topic of Concern for Living Things? (1) Is there an impact of the PBL model on learners' critical thinking science abilities in the topic of caring for living beings? (2) Is there any impact of motivation on learners' critical thinking abilities in Natural Science on the topic of Concern for Living Creatures? (3) Is there an interaction between the impact of the studying model and motivation on learners' critical thinking abilities in Natural Science in the topic of Caring for Living Beings?

Based on the problem formulation above, this research has several objectives which can be described as follows: (1) To decide the impact of PBL models on learner science studying output in the topic of caring for living beings? (2) To decide the effect of motivation on students' science learning outcomes on the topic of Concern for Living Beings? (3) To find out an interaction between studying models and motivation on learners' science studying output in the topic of caring for living beings? (4) To find out an impact of PBL models on learners' critical thinking abilities in science in the topic of caring for living beings? (5) To determine an impact of motivation on learners' critical thinking abilities in Natural Science on the topic of Concern for Living Beings? (6) To find out an interaction between studying models and motivation on learners' critical thinking abilities in Science in the Topic of Concern for Living Things?

III. Research Method

This research was conducted at Elementary School 026609 Jalan Sei Babalan, Pujidadi Village, South Binjai, Binjai City, Zip code 20727. The research schedule was planned to be carried out in accordance with the schedule for entering science subjects and teachers who teach in giving treatment are science subject teachers in class IV Elementary School 026609 Pujidadi Binjai. The reasons for the establishment of the 026609 Pujidadi Binjai Elementary School as a place for conducting research are: (1) The school has the availability of supporting learning facilities and facilities;(2) There has never been a similar research conducted in that school; and (3) the need to apply a new learning paradigm where so far the learning that has been carried out tends to use the expository method and has never applied a PBL model; and (4) The Principal is very open to research that can improve learning.

The study population were learners of class IV SD 026609 Pujidadi Binjai Academic Year 2019/2020 with 2 classes totaling 50 students. Each class has the same characteristics, meaning that each student uses the same curriculum. The study population is as in Table 2 below:

Table 2. The Study Population

No	Class	The Number of students
1.	V-1	21 Students
2.	V-2	21 Students
Total		42 Students

The study sample was done by total sampling technique (saturated sampling). Sugiyono (2013: 81) states that "saturated sampling is a sampling technique when all populations are used as samples". The experimental class V1, totaling twenty-five students (21), was taught with problem-based learning (PBL) and the V2 control class, totaling twenty-five students (21), was taught using expository learning. The research methodology employed is Experimental Quasi (Quasi Experimental Method). Research design as the basis for the application of the research is to differentiate the impact of PBL models and the impact of expository studying on learner findings and critical thinking abilities in science in terms of high studying motivation and low studying motivation. The treatment class is class V1 class V2.

Before being given the treatment, the researcher first gave a pretest to each class with the aim of knowing the students' initial abilities without being influenced by learning. The treatment was given to the experimental classroom, namely the class with PBL and the class using expository learning. The determination of the experimental class was done by lottery. The teacher who gave the treatment was chosen by two people and drawn to determine which experimental class to teach. Before the teacher teaches, they are first given an explanation of the implementation of the treatment they will do, and the learning environment is strived to be the same. In the implementation of the treatment there is no differentiation between groups who have high and low motivation. Grouping was only given at the time of data analysis, likewise students who were not selected as samples still received the same treatment as the sample, but were not analyzed. This kind of study is an experimental quasi research, which purposes to decide whether there is a findings of a treatment imposed on learners, namely learners.

IV. Discussion

4.1 Understanding Learning Outcomes

In learning happenings done by a person, it is not able to be differentiated of the results as a continuation of the learning efforts he does. Sometimes someone is also said to be successful in their learning activities, if the results they get are very good or satisfying. Studying output is able to be elaborated by comprehending the two words that shape it, such as "results" and "learning". The meaning of the result shows the achievement of the findings of an activity or process that causes in changes. Findings are the gains founded due to the acting of converting raw substances into finished goods. According to Dimiyati (2013: 10), "learning was a complex activity in the internal state and cognitive processes of students" with a stimulus from the environment. According to Hamid (2013: 2) Studying outputs are positively behavioral changes that happen after the teaching and learning procedure in accordance with educational goals. Every humans own potentially psychological behavior that is able to be guided and their behavior alterations which involve the cognitive, affective, and psychomotoric domains. Learning to seek behavioral changes in these domains so that learning outcomes represent behavioral changes in the cognitive, affective and psychomotoric domains.

4.2 Factors Affecting Learning Outcomes

Learning is a process that causes a change based on experience. Thus there are many things or aspects that affect or are involved in the teaching and studying procedure and those aspects also have an influence on student learning outcomes or achievement. According to Khairani (2013: 188), "the factors that cause studying problems is able to be categorized into two groups, such as: internal factors (self-factors), which involve physiological and psychological, external factors (factors from outside humans) including: non-social and social factors.

4.3 Definition of Problem Based Learning

Sutikno (2009: 31) states "Learning as a set of actions designed to support the learning process of students, by taking into account external events that play a role in a series of internal events that take place within students". In the studying procedure, the teacher is no longer an information center (teacher centered), but as a learning manager who is always ready to counsel and help students in learning. For example, group learning intends to create group dynamics so that the standard of instruction increases. In group study the number of quality students is expected to be greater. If the educator's attention in individual studying is focused on each individual, then the educator's attention in group learning is focused on the spirit of the group in solving problems. "Highly skilled" group members become the driving force for group problem solvers. The function of educators in group studying consist of (i) forming groups, (ii) planning group assignments, (iii) implementing them, and (iv) evaluating group learning outcomes (Fakhriyah, 2014: 3).

4.4 Characteristics of Problem Based Learning

PBL is the application of variety multiple of intelligence that are required to assign a controversial against real-world challenges, the competence to overcome everything new and existing complicated complexities. The attributes of PBL are as follows: (1) Problems are needed to become the starting point in learning; (2) The problems raised its intensity or frequency are problems that appear in the real world that are not structured; (3) Problems invite a variety of perspectives; (4)

Cases, challenging information possessed by students, potentialities. And capabilities which then need the choosing of studying needs and fresh areas of instruction; (5) Studying to direct selves is the highly significance thing; (6) Usage of variety of knowledge information sources, their usage, and assessment of data sources are important procedure in PBM; (7) Studying is doing collaboratively, communicatively, and cooperatively; (8) Promotion of discovering and problem solution abilities is as significance as mastering the substance of knowledge to find out alternative solutions for a problem; (9) The openness of the procedure in PBM involves the comprehensive and integration of a studying procedure; and (10) PBM includes assessing and summarizing learner experiences and the instruction phases.

4.5 The Objectives of PBL

Rusman (2012: 242) suggests PBL objectives (PBM) in more detail, namely: (1) helping learner promote thinking and problem-solution abilities; (2) studying variety of adult roles through their participation in obviously experiences; and (3) becoming an autonomous learners. PBM is used depending on the objectives to be achieved whether it is related to: (1) mastery of multidisciplinary content of knowledge; (2) mastery of process skills and heuristic discipline; (3) learn problem solving skills; (4) learn collaborative skills; and (5) learning broader life skills (Rusman, 2012: 248). When the objectives of PBM are broader, the problems become more complex and the PBM process requires a longer cycle. The type of PBM that will be included in the curriculum depends on the profile and maturity of the student, the student's past experience, flexibility, the existing curriculum, evaluation guidance, time, and available resources. PBM involves learners in self-selected research that allow learners interpreting and explaining real-world phenomena and build their insight of those phenomena.

4.6 Problem-Based Learning Steps

According to Rusman (2010: 74) "PBM begins with an unstructured problem, something chaotic. From this chaos, students use their various intelligences through discussion and research to determine real issues that exist. The steps that will be followed by students in a PBM process are: (1) finding the problem; (2) define the problem; (3) collect facts using the KND; (4) hypotheses; (5) research; (6) rephrasing the problem; (7) presenting alternatives; and (8) propose a solution". According to Arends (2008: 72) states that: "There are 7 steps that must be passed in problem-based learning, namely as follows: (1) Clarifying unclear terms and concepts, (2) Formulating problems; (3) Analyze the problem; (4) Organize your ideas and systematically analyze them deeply; (5) Formulating learning objectives; (6) Seek additional information from other sources (outside of group discussions); and (7) Synthesize (combine) and test new information". According to the opinion it is able to be stated that the steps for Lare as follows: (1) Asking the case; (2) Orienting learners to study; (3) Counseling individual and group researches, (4) Promoting and elaborating the work; and (5) Studying and assessing the problem-solution process.

4.7 Advantages and Weaknesses of Based Learning Models Problem

Sanjaya (2008: 220) states that PBL has advantages in studying. Following are the advantages of PBL: (1) Techniques are not good enough for understanding the substance of the nature; (2) Challenging learners' skills and providing the best one to discover novelty information of learners; (3) Improve learner's studying practices; (4) Helping students how to transfer their knowledge to understand problems in real life; (5) Facilitating learners promote novelty knowledge and have responsible for the studying they do; (6)

Encourage learners to self-evaluate both the findings and the studying procedure; (7) Show learners that every area (especially mathematics) is fundamentally a method of thinking, and something that have to be overcome by learners, not only studying from educators or from books; (8) More fun and liked by students; (9) Give chances for learners to implement the sciences they own in the real world; and (10) Promoting learners' interest in continuing to study even though studying in formal education has ended. Sanjaya (2008: 220) states that problem-based learning (PBL) has weaknesses in learning. The following are the limitations of PBL: (1) If learners have no interest or do not have the belief that the case being studied is hard to handle, they will feel reluctant to try; (2) It takes a long time, and (3) Without understanding they will not learn what they want to learn.

The findings founded from this research include the studying outputs of learners in the experimental and control classrooms, the learners' critical thinking abilities in the experimental and the control classrooms as well as the observation information of learners' studying motivation on the theme of caring for living beings.

The following indicates data on the pretest results from the experimental classroom that was educated using the PBL learning model based on motivation and the control classroom that was educated using the Expository learning pattern. The data description of the pretest results is presented on table 3 as follows:

Table 3: Data on Pretest Value of Learning Findings in Experiment and Control Classroom

Experiment Class			Control Class		
Score	Frequency	Relative Frequency (%)	Score	Frequency	Relative Frequency (%)
10 - 19	0	0	10 - 19	1	4,8
20 - 29	1	4,8	20 - 29	3	14,3
30 - 39	6	28,6	30 - 39	11	52,4
40 - 49	8	38,1	40 - 49	5	23,7
50 - 59	4	19,5	50 - 59	1	4,8
60 - 69	2	9,0	60 - 69	0	0
Total	21	100	Total	21	100
Average	43,81		Average	33,57	

Table 3 shows that the students' initial knowledge of the material cares for the environment, it is known that the generally pretest result for the experimental classroom was 43.81 and the average pretest result for the control class was 33.57. Furthermore, the two groups were given different treatment, namely the experimental group was educated using PBL based on motivation, meanwhile the control group was educated using the Expository studying pattern. At the end of the meeting, the learning process was given posttest to establish the studying outputs. The post-test findings are presented on Table 4 as follows:

Table 4. Posttest Value of Student Learning Outcomes

Class	Lowest	The highest	Amount	Average	Standard Deviation	Variance
Eksperimen	70	100	2392,0	81,67	7.800	60,833
Kontrol	55	85	2056,0	72,14	8.742	76,429

Table 4 shows that the experimental group that was taught with the motivation-based PBL model founded an averagely post-test result of 81.67 with a standard deviation of 7,800. Meanwhile, the control classroom that was taught using Expository obtained an average post-test result of 72.14 with a standard deviation of 8,742. From Table 4.2 it can be seen that the averagely studying outputs of the experimental classroom learners were higher than the averagely studying outputs of the control classroom.

In addition, the instruction emphasizing the development of procedure skills means guiding students to acquire skills in acquiring knowledge and presenting the results (Rustaman, 2005: 35). Learning with the PBL model contains activities that can train students to learn independently through investigation both at school and in the surrounding environment.

Research applying the PBL is in line with the results of research by Hardiyanti et al. (2017) which stated that in applying the PBL model there is a difference in N-gain science process skills of 0.71 and in the control classroom (lecturing and discussing methods). N-gain of 0.52. The problem based PBL model facilitates learners to constructing their own information by understanding the existing of an case to solving the problem. The impact of the PBL model on science procedure abilities in this study is also in line with the study of Handika and Muhammad (2013) which states that the PBL model is better than the conventional one on science procedure skills, this is able to be viewed from the results of their research where SD (sig = 0.000 < 0.05).

The significant difference in this study is in line with the research of Yoo, et al. (2015) which revealed that the PBL model effectively trains graduated nurses to increase their clinical problem-solution abilities compared to the lecture model. In addition, Angkotasari's research (2013) states that the PBL model is very effective when applied to learning to solve mathematical problems. Most of the problem based studying models are widely used in Mathematics in the context of a particular subject. The PBL model is also very appropriate to be implemented to other substances, including science.

The Results of this research showed that there is a significantly interaction between the implementation of the PBL model and Student's studying motivation. The interaction between the implementation of the PBL model and studying motivation occurs if both take a role in upgrading learner's studying outputs. That is, if learners who own highly motivation are educated by applying good instruction models such as the implementation of PBL models, then the studying outputs obtained will be good too. The interaction graph shown through the help of SPSS 23.0 shows that the lines of interaction between the implementation of the PBL model and the studying motivation of learners almost intersect. Learners who are educated by applying PBL models and have highly motivation for learning outcomes are also high, learners who are educated by applying expository studying models with highly motivation show lower studying outputs than the implementation of high motivation problem based instruction models. This shows here is an interaction between the implementation of PBL models with the studying motivation of learners.

Such as the theory developed by Jean Piaget which views that every individual has the ability to construct his own knowledge by interacting continuously with his environment. This view denies that science is something that can be transferred. This study found that a number of learners who were educated by applying a PBL model with a highly grade of motivation with a numbers of learners using a PBL model with a low level of motivation obtained a significant value of 0.000 with prob. 0.05 so it is able to be summarized that here are differentiations in the application of problem-based learning models with high levels of motivation with groups of students with the application of problem-based

studying models with low grade of motivation. This proves the grade of motivation of learners affects student studying outcomes. In the same instruction model, learners who have highly studying motivation get better results than learners who have low instruction motivation. The calculation of the Scheffe Test for groups of learners who are educated by applying a high motivation problem-based learning model with the application of a high motivation Expository model obtained a significance value of 0.014 with $p < 0.05$, thus giving the decision to reject H_0 . Thus it is concluded that here are differentiations in the application of the learning model between the highly motivation PBL model and the application of the highly motivation Expository model.

Depart from the information obtained, here are differentiations in the critical thought abilities of learners who are educated with the PBL with learners who are educated using the Expository instruction model where the average value of the studying outputs of learners who are educated with a PBL model is higher, namely 80.86 with an average gain score of 0.63 while the average value of the group of learners who were educated using the Expository studying model was 76.67 with an average gain score of 0.58. This fact proves that the application of the PBL model is better at increasing the critical thought abilities of learners than the implementation of the Expository instruction model. Thus teaching Science on Animal Life Cycle material by applying the PBL model will be better than applying the Expository learning model. The studying process with this model, students are directed to conduct a lot of experiments repeatedly. This repeated and independent experiment purposes to build and to test hypotheses (PBL syntax), thereby fostering student activeness in proposing questions and communicating their knowledge to their friends.

V. Conclusion

Referred to the results of research and discussion, it is able to be summarized several things are in accordance with the objectives of this study, namely: (1) The implementation of the PBL model can affect studying outputs better than the Expository instruction model. This is based on the findings of the first hypothesis test that the significance of anava ($= 0.000$) is smaller than the significance level ($= 0.05$), and F_{count} ($= 27.273$) is greater than F_{table} ($= 2.061$) so that H_0 is rejected, and also based on the average analysis. The average studying outputs of learners who apply the PBL model ($= 81.67$) are higher than learners who apply the Expository model ($= 72.14$). (2) A high level of motivation can affect the studying outputs of learners better than low motivation. This is based on the results of the second hypothesis test that the significance of anava ($= 0.002$) is smaller than the significance level ($= 0.05$), and F_{count} ($= 37.322$) is greater than F_{table} ($= 2.061$) so that H_0 is rejected, and also based on the average analysis. Average learning outcomes of students based on the level of motivation to learn that the average learning outcomes of students who have high motivation ($= 82.27$) are higher than learners who have low motivation ($= 71.00$). (3) There is an interaction between the implementation of the PBL model and the Expository studying model with the grade of instruction motivation in influencing studying outputs. This conclusion is taken from the findings of the third hypothesis test that the significance of anava ($= 0.008$) is smaller than the significance level ($= 0.05$), and F_{count} ($= 4.641$) is greater than F_{table} ($= 2.061$) so that H_0 is rejected. (4) The application of the PBL model can affect critical thought abilities better than the Expository instruction model. This statement is understood from the findings of the first hypothesis test that the significance of anava ($= 0.006$) is smaller than the significance level ($= 0.05$), and F_{count} ($= 8.444$) is greater than F_{table} ($= 2.061$) so that H_0 is rejected, and also based on the average analysis. The average studying outcomes of learners who apply the PBL model ($= 80.86$) are higher than learners who apply the Expository model ($= 76.67$). (5) Highly grade of motivation can affect students' critical thinking skills better than low motivation. This is based on the results of the second hypothesis test that the significance of anava ($= 0.000$) is

smaller than the significance level ($= 0.05$), and F_{count} ($= 33.484$) is greater than F_{table} ($= 2.061$) so that H_0 is rejected, and also based on the average analysis. Average studying outputs of learners based on the grade of motivation to learn that the average studying outputs of learners who have highly motivation ($= 82.73$) are higher than learners who have low motivation ($= 74.40$).

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