

Analysis of Critical Thinking Skills in Problem Based Learning Model Based on Thematic Learning

Aenullael Mukarromah
 Post Graduate Programme
 Universitas Negeri Yogyakarta
 Yogyakarta, Indonesia
 anenullael86@gmail.com

E. Kuss Eddy Sartono
 Post Graduate Programme
 Universitas Negeri Yogyakarta
 Yogyakarta, Indonesia
 Pjj_kusediasartono@yahoo.com

Abstract— The purpose of this research is to know the critical thinking ability of a primary school after getting a treatment by applying problem-based learning model (PBL) based on thematic learning. This research is a descriptive research, with a quantitative method. The research was conducted at SDN 1 Mada. The population in this research is the fourth-grade students in IV Nada District who enrolled in the even semester of the academic year 2017/2018. A Sample in this research is class IV at SDN 1 Mada, which is 25 participants. The data collection used is a questionnaire test with a total of 10 items covering all five categories of critical thinking skills according to Nitko and Brookhart namely (1) elementary clarification, (2) basic support of argument, (3) inferences, (4) advanced clarification, and (5) strategies and tactics. From the result of the test of the students with critical thinking ability; after getting treatment of the PBL model; 52% are with a very high category, and 48% high category with an average value of 76,6. From the result of the research, it can be concluded that overall the fourth-grade students of SDN 1 Mada in the (even)seventh? semester of the academic year of 2017/2018 have the ability to think highly.

Keywords—PBL model, critical thinking, thematic learning

I. INTRODUCTION

The ability to think critically is one of the abilities that must be possessed by learners. In the 2013 curriculum learners are required to be able to think in a high level, so participants do not only receive the material, but they must be able to think, then argue and ask questions. In line with the statement of the Minister of Education and Culture, the 2013 curriculum is expected to produce productive, creative, innovative and effective Indonesian people through strengthening attitudes, skills and integrated knowledge, therefore a good education management will have an impact when it can handle the formation of the nation and moral issues.

Today, many teachers only deliver material without guiding learners to improve their ability to think critically. The critical thinker should primarily have

interesting arguments and succeed in providing good reasons for acting or believing. Teachers have a role to be a facilitator in education, this is so that change can occur because the task teacher does not only teach (teacher center) but learn from the student (student center). This can lead to the likelihood that learners are more active and critical in the implementation of learning, which is a greater opportunity to improve their understanding of the material.

Permendikbud No. 103 explains that one characteristic in the curriculum of 2013 is using scientific and thematic integrative approach which includes: observing, asking, collecting, reasoning and communicating. To facilitate learners in the implementation of learning and to answer these challenges, a learning model that can be used is required. Problem Based Learning (PBL) is considered to support improving students' critical thinking skills. PBL models makes learners active in learning because teachers can associate with a real-world subject matter, experience, knowledge, and learning, hence the teacher is only a facilitator.

A. The Structure

- The result of the observation of the fourth-grade students at SDN 1 Mada illustrates that the students still can not think critically during the learning process, the learner only accepts, notes and listens to what is explained by the teacher without asking or raising the argument. So high-level thinking skills that exist in the 2013 curriculum are not achieved ultimately. This can be seen when the teacher explains the material or when the learners get the questions that require them to think critically.
- This study was conducted to know the critical thinking ability of elementary school students after getting treatment with an application of problem-based learning model (PBL) based on thematic learning.
- Implementation of learning in the classroom does not provide an overview of the student the

center, so teachers only use 1 variation of teaching without heeding the students so that they can think critically. With this research, it is expected that fourth-grade students are able to think critically and teachers can become facilitators.

- Research subjects are only limited to class IV while the object of the research is the analysis of critical thinking skills of learners with PBL model.

B. Reference Citations

Problem-based learning is one of the problem-based learning models which emphasizes the analytical thinking ability in solving problems. A Model of learning with PBL is related to real-life problems of learners and is an authentic problem. Levin explained that " PBL is one way to simulate real-world problem solving, learn the important content material, and practice important skills under the leadership of a teacher who acts as a guide, a coach, and a facilitator of student learning" [1]. Teachers in the classroom using the PBL model act as facilitators to ensure that learners make significant progress through discussions of the issues presented. Learners engage directly in the implementation of learning either in groups or individually, so that they build the framework of the problem of students to see correctly. Baden and Major explain that problem-based learning is an approach in which it is acknowledged that learners should develop metacognitive skills and thus it is expected that students use reasoning abilities to manage or solve complex problems. [2].

Problem-based learning has characteristics other than authentic presentation of the problem. It also has other characteristics that support the uniqueness itself. Arends describes the features of PBL namely: a). Driving question or problem, b). Interdisciplinary focus, c). The authentic investigation, d). Production of artifacts and exhibits, e). Collaboration [3]. These characteristics illustrate that the PBL model can be found so that learners and teachers can distinguish models of PBL learning and conventional learning. The implementation of learning with the PBL model presented by Arends in its implementation leads learners to the problem, so learners can reflect on their investigations and the processes they use when analyzing and evaluating the problem-solving process [4].

TABLE I. THE SYNTAX OF PBL

Phase 1	Orient students to the problem
Phase 2	Organize students for study
Phase 3	Assist independent and group investigations
Phase 4	Develop and present artifacts and exhibits
Phase 5	Analyze and evaluate the problem-solving process

Implementation of learning in schools should apply strategies for learners to become accustomed to critical thinking. Critical pessimism is the ability that must continue to grow because its presence is not immediately available. Critical thinking is easy and simple, only if it is done for a long time and consistently, in orde to get used to being someone who can think critically. It is like Paul and Elder say that "critical thinking is routinely taught; consistently fostered" [5].

The ability to think critically is one of the high-level thinking skills a student must have to be taught, in enhancing the cognitive activity of learners using the mind, as Cottrell says that " critical thinking is a cognitive activity, associated with using the mind, learning to think in critically analytical and evaluative means by mental processes such as attention, categorization, selection, and judgment " [6]. Hains-Wesson states that "... It can be defined as an active, intellectual process where the individual will observe, analyze and reflect on new knowledge and integrate it into their current understanding" [7]. This illustrates that critical thinking should be familiarized to learners, not only do they get answers, but they are accustomed to thinking, finding out they can also be well documented.

Brookfield describes critical thinking as a habit of making [8]. While Browne and Keeley state that critical thinking consists of an awareness of a set of interrelated critical questions, plus the ability and willingness to ask and answer them in appropriate times [9]. The definition of these two experts describes critical thinking as a habit of assuming accurately and the actions performed in accordance with the requirement, because critical thinking doesn't only consist of a set of critical questions, but also the ability and the willingness of nature to ask and answer questions with the right time.

TABLE II. CATEGORY OF CRITICAL THINKING ABILTY IN THIS RESEARCH

Category	Indicator
Elementary clarification	Make a basic clarification of the concept presented and look at the similarities and differences of one or two arguments
Basic support of argument	Provide evidence and reason for the credibility of information by providing argument support
Inferences	Make the conclusion correctly and logically based on the data obtained
Advanced clarification,	Identify the assumptions required for a particular issue or condition
Strategies and tactics	Formulate alternative solutions to be done

According to Sukmadinata & Syaodih the steps in critical thinking are (a) determining the issues, problems, plans or main activities studied. The subject matter needs to be determined and formulated clearly because it will be the focus of the study; (b) the point of view, from the point of view to which the subject of the study is examined; (c) the reasons for the selection

of the subject matter, each selection of the subject matter needs to have a strong reason; (d) formulation of assumptions; (e) the use of clear language, the use of clear language in formulating, and assessing issues will improve thinking ability; (f) support of facts; (g) the expected conclusion, and (h) the implication of the conclusion [10].

The new curriculum that has been implemented at the present time is the limited 2013 curriculum, especially in schools that are considered ready to implement it. The idea of curriculum 2013 is to organize learning activities and is a follow-up of the development of competency-based curriculum pioneered since 2004 and KTSP. The emphasis on the 2013 curriculum is on the pattern of thinking, material expansion, learning process and adjustment of learning load. Besides, in the learning that goes with the thematic book, learners are required to be able to think in a high level, so that learners do not only accept the material are also able to argue. The quality of learning processes in an implementation can be seen from the results of the critical thinking skills of participants at the time of the learning, also undertaken from the learners themselves [11].

Considering the importance of critical thinking ability in improving learners' learning, it is necessary to conduct a research aimed at measuring the level of critical thinking ability of the data that will be obtained from the learners' learning result with the test sheet description in SDN 1 Mada.

II. LITERATURE REVIEW

A research conducted by Munahefi, Waluya and Rohmad 2018 [12], examines the Analysis of creative mathematical thinking skills in problem-based learning model based on self-regulation learning. The purpose of this research is the effectiveness of Problem Based Learning (PBL) based on Self Regulation Learning (SRL) on the ability of mathematical creative thinking of high school students in solving mathematical problems. The ability of mathematical creative thinking of low academic level students to PBL model approach of SRL was achieving the aspect of fluency and flexibility. Students of the academic level were achieving fluency and flexibility aspects well. But the originality of the students at the academic level was not yet well structured. Students of a high academic level could reach the aspect of originality. The difference in this study is on the critical thinking ability of the school level as well as subjects. [13] Another research conducted by Yunita S., Salastri Rohiat, Hermansyah Amir 2018 on an analysis of the critical thinking abilities of chemical subjects in class XI IPA students of SMAN 1 Kepahiang, aims to know the critical thinking ability of students. This research is different on the subject and object studied, so it is not the same as that done by the researcher.

III. MATERIAL AND METHODOLOGY

The type of the research is a descriptive research with the aim to describe phenomena and the state of things as it is, systematically can be depicted object or subject and the facts are examined appropriately [14]. The purpose of a descriptive research is to obtain data because the data used is qualitative, which serves to describe the ability to be critical thinking students. The population in this research is the fourth-grade students in IV Nada Districts who are enrolled in the even (seventh)? semester of the academic year of 2017/2018. A Sample in this research is class IV at SDN 1 Mada, which has a number of 25 participants on thematic learning. The instrument used in collecting all the data is a description test. Existing tests are given after students learn the lesson PBL models to be able to have information about their critical thinking ability. The critical thinking ability of learners is analyzed by examining the results of their answers in an attempt to solve the problem of critical thinking on the matter of descriptions and by observing learners.

IV. RESULT AND DISCUSSION

The research was conducted at SDN 1 Mada. The population in this research is the fourth-grade students in IV Nada Districts who are enrolled in the academic year 2017/2018. A Sample in this research is class IV at SDN 1 Mada, which is a number of 25 participants. This study was conducted after the material on thematic learning with PBL model implemented, then it is intended to be able to know the ability of critical thinking of learners. There are 5 categories given in percentage on the number of solved descriptions answered by learners who have received the treatment.

TABLE III. PERCENTAGE LEVEL CRITICAL THINKING [15]

Category	Interval	Score	Percentage	The number of students
Very high	$M_i + 1,5 Sdi < X \leq M_i + 3 Sdi$	$75 < X \leq 100$	52%	13 people
High	$M_i + 0,5 Sdi < X \leq M_i + 1,5 Sdi$	$58,33 < X \leq 75$	48%	12 people
Medium	$M_i - 0,5 Sdi < X \leq M_i - 0,5 Sdi$	$41,66 < X \leq 58,33$	-	-
Low	$M_i - 1,5 Sdi < X \leq M_i - 0,5 Sdi$	$25 < X \leq 41,66$	-	-
Very low	$M_i - 3 Sdi < X \leq M_i - 1,5 Sdi$	$0 < X \leq 25$	-	-
amount			100%	25 students

In table III the calculation of M_i and Sdi values is obtained from:

$$M_i = (100 + 0)/2 = 50$$

$$Sdi = (100-0)/6 = 16.6667$$

The results of calculations M_i and Sdi are obtained, then they are used to determine the criteria of the ability of critical learners.

Information :

Ideal average (M_i) : (maximum ideal score + minimum ideal score)/2

Ideal deviation standard (S_{di}) : (minimum ideal score - minimum score)/6
 X : the total actual score

Table III shows that the percentage obtained from the results of the participants' answers and the calculation of interval values are within the category of "very high" with a percentage of 52% with 13 people, and "high" 48% with 12 people; out of 25 students. This indicates that learners have the ability to think in a high level after getting the treatment. Even moderate, low, and very low categories do not exist. This study that the level of critical thinking ability of learners on the given problem is big. This means that learners can easily understand the questions and can respond appropriately, but also that they are able to think clearly and critically, the average score of learners being 76.6.

TABLE IV. PERCENTAGE OF LEARNERS SCORES

No	Scores	Average Score Gained
1	72	3
2	72	3
3	70	2.92
4	83	3.44
5	74	3.1
6	74	3.08
7	79	3.32
8	69	2.88
9	80	3.36
10	59	2.48

Table 4 showcases the critical thinking ability of students of class IV SDN I Mada, with a number of 25 students based on the classification of critical thinking according to Nitko and Brookhart. The test results of the critical thinking level of learners based on the number of percentage of answers are very high, high, medium, low, and very low. Each question with has a different score. To the 25 students, 10 questions were given with 5 categories of critical thinking ability in each question. Problems 1 & 6 make basic clarifications, questions 3 & 10 assess basic information support, questions 4 & 9 draw conclusions, questions 2 & 8 do advanced clarification, and questions 5 & 7 apply strategies and tactics to solve problems. This shows that each category in the matter has a different degree, so that a person with critical thinking skills is open, confident, appreciative of honesty and thoroughness when confronted with opinions or concepts he considers good [16]. Teachers improve the ability of learners in critical thinking as much as possible. Conventional methods, and Q & A methods are usually regarded as appropriate in teaching learners; that results in unaccustomed learners who are able to develop critical thinking skills.

Nowadays, learners are basically required to have critical thinking skills, and teachers are the greatest hope in determining strategies, tactics, methods, and models in implementing learning to fit a student-centered approach as well as their characteristics. High-level learners need to be designed and trained by

the teacher to be an experience for learners [17]. Thus, there should be a model of learning to be more varied in training the ability of learners in critical thinking, so that they can solve problems presented with their ideas until no new problems are found. This leads learners with the ability to think critically to socialize easily both with new environments and new atmospheres. The ability of learners can be increased when trained by using models such as problem-based learning [18].

V. CONCLUSION

The conclusion of the research is that students of class IV S DN 1 Mada in the even semester of academic year 2017/2018 have a very high critical thinking ability after the treatment with problem based learning model with an average value of 76,6 which is grouped in the very high category with 52% and 48% higher. This is Based on the 5 categories of critical thinking skills according to Nitko and Brookhart namely Elementary clarification, Basic support of arguments, Inferences, Advanced clarification, Strategies, and tactics; treatment with PBL model at the stage of Orienting students to the problem, Organizing students for the study, Assisting independent and group invention, Developing and presenting artifacts and exhibits, Analyzing and evaluating the problem-solving process. This indicates that the fourth- grade learners have the ability to think critically if accompanied with a supportive learning model.

Teachers generally have to know the level of ability of learners in understanding, evaluate and make observations at the time of the learning process by using observation sheet, so it can help finding difficulties in learners, especially on subjects which are considered difficult.

For subsequent research, it is expected that the data collection is done several times, which is accompanied by observation at the time of learning, especially at the time of discussion this can give a description of critical thinking ability of learners in order to get more accurate results.

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