

Improving Skills of Critical Thinking of Students Through Edmodo-Helped Problem Based Learning Model for Fifth Grade Students of Elementary School

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DOI: 10.29322/IJSRP.9.07.2019.p91129

<http://dx.doi.org/10.29322/IJSRP.9.07.2019.p91129>

Abstract- This study aims to improve students' critical thinking skills in fifth grade students through *Edmodo's Assisted Problem Based Learning* model. The location of the study was at Lowokwaru Elementary School 2 Malang, with 34 subjects in the fifth grade-A. This study used Quasi Experiment with the design of *one group pretest posttest design*. This study was conducted in 2 meetings, by doing several stages, namely, developing a Learning Implementation Plan (RPP), Student Worksheet (LKS), and Critical Thinking Skills Test. Data collection techniques use the method of observation of teacher activities and student activities, tests, and student response questionnaires. The results showed an increase from the first meeting to the second meeting. For teacher activities at the first meeting the percentage was 81.40%, and at the second meeting the percentage increased to 92.10%. The activity of students in the first meeting had a percentage of 79.10% and at the second meeting the percentage increased to 94.10%. Improvement of students' critical thinking skills can be seen from the results of evaluations at the *pretest* and *posttest* which respectively have the results of the average *pretest* scores 55 and *posttest* values with an average of 92. While the aspects of student responses to learning activities using *edmodo* assisted *Problem Based Learning* models show percentage of 87%

Index Terms- Critical thinking skills, Problem Based Learning (PBL), Edmodo

I. INTRODUCTION

Towards the 21st century, the development of science and technology, especially in the field of information and communication, is growing rapidly. In addition, competition in life in the era has an influence on all aspects of life, including in the field of education. In facing the era of modernization, the education system in Indonesia is expected to be able to equip students with learning skills and life skills, one of which is critical thinking skills. Critical thinking skills are skills that must be possessed by students by referring to five indicators namely providing simple explanations, building basic skills, making inferences, giving further explanations, and managing strategies and tactics. Critical thinking skills are not skills that exist from birth, but skills that can be trained in the learning process (Ennis, 2011).

Critical thinking skills can be developed through learning approaches with learner-centered (Snyder & Wiles, 2015). These skills can be improved through *open-ended* questions during discussions and the provision of problem-based activities in each learning activity (Awang & Ramli, 2008). Many learning approaches are student-centered, one of which is the *Problem Based Learning* (PBL) model. According to the journal that has been investigated by Yuan, et al (2008) by adapting learning theory from Vygotsky found that PBL can improve students' critical thinking skills. The increase occurs because of the process of social interaction and cognition situated in the learning process. The success of the teaching and learning process in the classroom is also supported by learning tools used by a teacher, one of which is the use of learning media. Learning media has an important role to help the learning process. This is in accordance with the journal examined by Thaiposri & Wannapiroon (2015); Al-Rahmi & Zeki (2017) that students' critical thinking skills can be improved through the use of media (*online*) that have the result that information and communication technology has an important role for students to learn. Interesting social media (*online*) learning media are studied because, as Turkle (2010) says, by adapting Piaget's learning theory, it is found that the internet can form different social identities with *face to face* identities.

The forms of ICT utilization are very diverse, one of which is the use of *e-learning* (El-Seoud et al., 2014). According to the *Association for Educational Communications Technology* (AECT) in 2008, *e-learning* was a web-based feature oriented towards providing learning facilities to improve performance by creating, using, and managing technologies that fit processes and resources. The utilization of *e-learning* features includes reading, discussion, constructing knowledge, expressions (chat features) activities, and even searching for information (Ibrahim, 2015). *E-learning* is a learning activity using media sites (websites) that are accessed through the internet network. According to the type of website there is a variety of which one of them is a combination of social networking websites and *e-learning* which includes *Edmodo*.

Edmodo is a social media based learning platform aimed at teachers, students, and parents. *Edmodo* provides space to build virtual classes based on class distribution like in school. Teachers can easily send assignments, assessments, and quizzes through *Edmodo*. The process that must be passed to join a group in

Edmodo is to use or enter the code that is owned by the teacher. The application of *Edmodo*-based *e-learning* still requires teachers as *scaffolding* to set values in the learning process (Setyowati, 2017).

Quoted from the results of interviews conducted by researchers at one of the VA class teachers at Lowokwaru Elementary School 2 Malang on August 24, 2018, Farid Pribadi stated that Lowokwaru 2 Elementary School Malang was one of the schools in Malang City based on Adiwiyata, so that it had potential support, one of which is in the development of learning media. All classes are equipped with LCDs and projectors that can be used to support IT-based learning. In addition, teachers and students are also familiar with technology and there are also computer laboratories and intranet network facilities that can be used in learning. However, the use of computer labs is still not optimal, this is because these laboratories are often used for ICT learning and their use in daily thematic learning is very rare.

Things that can support other learning are gadgets owned by teachers that can actually be used as support in creative and innovative media design for learning, however, in reality the teachers have not been able to utilize some of the gadgets they have. Teachers often access through standard applications, for example Microsoft Word or Microsoft Power Point which are used to present material and practice questions to students in learning. This results in students still having difficulty in concretizing abstract concepts. Another problem that was found was that students in V-A class in answering questions from the teacher were still fixated in text or books, so when the teacher gave the *Out of the Box* questions the students still looked confused.

If observed, the statement of one of the teachers interviewed was that the facilities and infrastructure contained in the school were adequate, but in application and utilization still needed innovation or development. Therefore in this study we will try to develop *edmodo*-based *e-learning* in problem-based learning to improve critical thinking skills of fifth grade students.

II. METHOD

This study uses a type of quantitative research. The location of the research is in Lowokwaru Elementary School 2 Malang. The research subjects were V-A class teachers and V-A grade students at Lowokwaru 2 Elementary School Malang with a

total of 34 students. This research was carried out in a collaborative form between researchers and classroom teachers. The research design used was *one group pretest posttest design*. The design of this study will use one group which will be observed at the *pretest* (O1) stage which is then followed by giving certain treatments (X) and *posttest* (O2). The *one-group pretest-posttest design* can be written in the form:

O1 X O2

Information:

O1 = initial test (*pretest*) to find out students' critical thinking skills

O2 = final test (*posttest*) to find out students' critical thinking skills

X = treatment of learning by using *edmodo*-based *e-learning* in problem-based learning

Data collection techniques use the method of observation of teacher activities and student activities, tests, and student response questionnaires. Data collection techniques in the form of tests are prepared to analyze the improvement of students' critical thinking skills and are given at the beginning and end of learning. The data collection tool uses an evaluation sheet. The questions on the evaluation sheet are adjusted to the learning indicators provided by the teacher.

III. RESULT AND DISCUSSION

Result

The following will be explained about the results and discussion of quantitative research conducted by researchers with the title "Improving Students' Critical Thinking Skills Through *Edmodo*'s Assisted *Problem Based Learning* Model for Class V Elementary School Students". This study uses Quasi Experiment with the design of *one group pretest posttest design* to obtain data about teacher activities, student activities, increase tests of critical thinking skills, and student responses.

1. Implementation of RPP in Teacher Activities

The following is a table of implementation of lesson plans by the teacher:

Table 1. Teacher Activity Data

Meeting	Teacher Activity Average Score	Percentage of Teacher Activity	Category
1	4.07	81.40 %	Good
2	4.60	92.10 %	Very Good
Average	4.33	86.75 %	Very Good

Based on Table 1 it is shown that learning with *edmodo*-based *e-learning* in PBL models to improve students' critical thinking skills is carried out in a very good category. The data shows the percentage of learning feasibility in each meeting containing preliminary activities, core activities, and closing activities which were assessed by two observers. At the 1st

meeting, the final average score was 4.07 with the percentage of suitability of the two observers' assessment amounting to 81.4%. While at the 2nd meeting the final average score is 4.60 with the percentage of appraisal of the two observers equaling 92.1%.

2. Student Activity

Table 2. Student Activity

Meeting	Average Student Activity Score	Percentage of Activity of Students	Category
1	3.95	79.10 %	Good
2	4.72	94.54 %	Very Good
Average	4.33	85.45 %	Good

Based on Table 2, it is shown that in general the activities of students observed in each meeting recorded by two observers during the learning process are considered Good. At the 1st meeting, the final average score of activity was 3.95 with a percentage of two observers matching 79.10%. While at the

second meeting the final average score was 4.72 with the percentage of appraisal of the two observers equaling 94.54%.

3. Test of Critical Thinking Skills

Table 3. Test of Critical Thinking Skills

Student	Pretest		Posttest		Enhancement	
	Score	Category	Score	Category	G	Category
1.	54	Not completed	93	Completed	0.85	High
2.	60	Not completed	83	Completed	0.58	Medium
3.	50	Not completed	100	Completed	1.00	High
4.	60	Not completed	100	Completed	1.00	High
5.	52	Not completed	93	Completed	0.86	High
6.	40	Not completed	97	Completed	0.95	High
7.	52	Not completed	87	Completed	0.73	High
8.	55	Not completed	100	Completed	1.00	High
9.	64	Not completed	97	Completed	0.92	High
10.	60	Not completed	100	Completed	1.00	High
11.	52	Not completed	100	Completed	1.00	High
12.	46	Not completed	93	Completed	0.86	High
13.	46	Not completed	100	Completed	1.00	High
14.	60	Not completed	90	Completed	0.75	High
15.	62	Not completed	83	Completed	0.56	Medium
16.	60	Not completed	87	Completed	0.68	Medium
17.	52	Not completed	80	Completed	0.62	Medium
18.	54	Not completed	90	Completed	0.78	High
19.	40	Not completed	87	Completed	0.78	High
20.	52	Not completed	100	Completed	1.00	High
21.	60	Not completed	86	Completed	0.65	Medium
22.	50	Not completed	87	Completed	0.54	Medium
23.	50	Not completed	93	Completed	0.86	High
24.	55	Not completed	97	Completed	0.93	High
25.	60	Not completed	83	Completed	0.58	Medium
26.	46	Not completed	80	Completed	0.63	Medium
27.	54	Not completed	93	Completed	0.85	High
28.	52	Not completed	100	Completed	1.00	High
29.	55	Not completed	93	Completed	0.84	High
30.	68	Not completed	100	Completed	1.00	High
31.	55	Not completed	87	Completed	0.71	High
32.	46	Not completed	87	Completed	0.76	High
33.	55	Not completed	97	Completed	0.93	High
34.	58	Not completed	100	Completed	1.00	High
Average	55	Not completed	92	Completed	0.82	High

Based on Table 3, it was shown that the average value of the students' critical thinking skills at *pretest* was 55 with the Not Completed category, while at the *posttest* it was 92 with the Completed category. Based on these two data there is an increase in the average value of students' critical thinking skills before and after the implementation of *edmodo*-based *e-learning* in problem-based learning. Increased critical thinking skills of High category students with an average score of n-gain of 0.82.

4. Student Response

Table 4. Student Response

Student	Questionnaire Indicator								Σ TSEV	Σ s_max
	1	2	3	4	5	6	7	8		
1.	5	5	5	5	4	4	4	5	37	40
2.	5	5	4	5	5	4	4	5	37	40
3.	5	5	5	4	5	4	4	5	37	40
4.	5	4	4	5	4	5	5	5	37	40
5.	4	4	5	4	5	4	5	5	36	40
6.	4	4	5	4	5	4	4	5	35	40
7.	5	4	5	3	5	5	4	5	36	40
8.	5	4	5	4	5	4	4	5	36	40
9.	5	4	3	5	5	3	4	5	35	40
10.	5	4	5	5	5	4	5	5	36	40
11.	5	4	3	5	4	5	4	4	34	40
12.	5	4	3	5	5	3	4	5	34	40
13.	5	4	4	4	5	5	4	3	31	40
14.	4	4	5	5	4	3	4	4	33	40
15.	5	4	4	4	5	5	4	5	36	40
16.	5	4	3	3	4	4	4	4	31	40
17.	4	5	3	5	5	5	4	4	34	40
18.	5	4	5	3	5	4	5	4	36	40
19.	5	4	3	3	3	4	5	5	32	40
20.	5	4	3	5	5	3	3	4	32	40
21.	5	4	5	3	5	5	5	5	37	40
22.	5	5	3	5	3	3	5	5	34	40
23.	5	4	3	5	3	5	5	5	34	40
24.	4	3	5	5	4	5	5	5	36	40
25.	5	4	5	5	4	4	4	4	35	40

26.	5	4	5	5	5	5	4	4	37	40
27.	4	4	4	5	5	5	5	4	36	40
28.	4	3	3	4	4	5	5	5	33	40
29.	5	5	3	4	4	4	5	5	35	40
30.	4	4	4	4	5	5	4	4	34	40
31.	4	4	5	5	4	3	4	4	33	40
32.	5	5	5	4	3	4	3	4	34	40
33.	3	5	4	4	4	5	5	5	35	40
34.	3	5	3	5	5	5	5	4	35	40
Total									1185	1360

Table 4 shows the percentage of students' responses to learning activities by using *edmodo*-based *e-learning* in problem-based learning through 8 item statements. Of the 8 items of statements that have been given, obtained answers with very good categories. Based on the table it can be interpreted that the response of students to the learning that has been done is Very Good with a final percentage of 87%.

IV. DISCUSSION

1. Implementation of Learning

In the preliminary activity, there is one phase of the problem learning model, namely the orientation phase of the students towards the problem. The introduction of problems is the most important phase in the problem-based learning model, because new understanding will be formed if the experience of the students is involved in the problem situation created by the teacher (Savery, 2006). This activity begins with a joint prayer activity, which is then followed by the delivery of learning objectives to be achieved. Apperception activities will have an impact on the formation of students' initial schemes because the higher the level of attention of students in learning, the higher the ability of students to absorb information in the learning process (Lapono, 2008). The second activity is core activities. The core activities consist of 4 phases of problem-based learning models which include phase 2 orienting students to learn, phase 3 guiding students to carry out individual and group activities, phase 4 developing and presenting the work, and phase 5 analyzing and evaluating problem solving processes (Mustaji, 2018). The four phases in problem-based learning in this activity can help students optimally in improving critical thinking skills. To provide further explanation in critical thinking, students are required to be able to provide sources of evidence that support their explanation regarding the learning done. The core activity in learning begins with phase 2 of the problem learning model, which is to orient students to learn. In this phase it teaches students to learn how to design problem solving strategies, conduct investigations, and collect data (Hosnan, 2016; Wayne, et al., 2015). During this phase, each group will be given the opportunity to argue and

criticize the opinions of other groups so that each group will share and evaluate alternative conclusions that have been written. In other words, this discussion session was designed to give students the opportunity to learn to criticize the products produced (conclusions or explanations), the methods used, and the relevant sources chosen. That is because problem-based learning does not have a patent answer or a definite answer, so that each argument will be asked for evidence and strong reasons (Silver, 2004; Savery, 2006; Hosnan, 2016). The next activity after the students have had discussions between groups to improve and criticize the results of their work and other groups, students are assigned to compile a written report that contains all the results of the discussion and explanation during the learning activities. The results of the report will then be evaluated or reviewed by other groups in order to obtain final conclusions that have been agreed between groups (Wayne, et al., 2015; Hosnan, 2016).

2. Student Activity

There are 11 aspects observed as assessment material by two observers during the learning process that are expected to emerge during learning are discussion activities that can improve students' critical thinking skills. These aspects are listed in the student assessment sheet on points 3, 4, 6, 8, and 9. In the table, data is presented on the activities of the third student, namely the students look at the task of investigating information through the activities that have been presented in the Assignment feature and the link in *Edmodo* to recognize the topic of the problem, categorized very well with the average score of each meeting in a sequence of 3.5 and 4.5. By paying attention to the question item 3, it will help students in completing the fourth activity, namely designing a solution to the problems surrounding the material presented in the Assignment feature according to the steps in the LKPD. The score of the fourth item in the fourth row is 4 and 4.5 with good and very good categories. There was an increase in activity from the first meeting to the last meeting for two meetings, it showed that students began to focus on designing solutions to problems surrounding the material presented in the Assignment feature according to the steps in the LKPD. The fifth aspect is to fill the mind map of argumentation as a result of the data obtained in the material from the Assignment feature. Based on the results of the activities obtained, the average score for the two meetings

is 4 and 5 respectively in the good category at the first meeting, and very good at the second meeting. At this fifth meeting there was an increase in scores, it showed that students began actively in building basic statements, giving further explanations, and conclusions in making mind maps (Hosnan, 2016). The activity of the sixth student is that students conduct interactive discussions between groups so that they can exchange arguments, criticisms, and improve explanations in the discussion forum at *Edmodo*. This activity must be carried out through group and inter-group discussions to discuss arguments or explanations that have been expressed by other groups to determine agreed and acceptable statements (Hosnan, 2016). Based on Table 4.7 the sixth activity in the two meetings experienced an increase in scores in a row namely 3.5 and 5 with sufficient and very good categories. This increase shows that students begin to actively engage in discussion activities and argue in the classroom. The activities of the sixth, seventh, eighth, and ninth students are interrelated activities. The four activities of the students are the follow-up activities carried out by students in the discussion activities, namely making and reviewing the results of discussions conducted. This report provides opportunities for students to explain the purpose of the discussion in solving problems, the methods used, and the results of their overall explanation. Writing activities are integrated into problem-based learning models with the aim that individuals can understand how to make clear evidence to be presented to readers and how to make acceptable explanations (Wayne, et al., 2015; Hosnan, 2016; Rusman, 2010).

3. Test of Critical Thinking Skill

Critical thinking skills can be developed through learning approaches with learner-centered (Snyder & Wiles, 2015). These skills can be improved through *open-ended* questions during discussions and the provision of problem-based activities in each learning activity (Awang & Ramli, 2008). Many learning approaches are student-centered, one of which is the *Problem Based Learning* (PBL) model. According to Awan, et al. (2017) the PBL model is based on Vygotsky's learning theory by using the structure of the Progressivism Philosophy and Philosophy of Pragmatism which develops human-human learning processes. According to the journal that has been investigated by Yuan, et al (2008) by adapting learning theory from Vygotsky found that PBL can improve students' critical thinking skills. The increase occurs because of the process of social interaction, assimilation, accommodation, and cognition situated in the learning process. The most fundamental thing about this theory is that there is a relationship between the learning process and the experience of students, so that if new information is received by students in line with their experience, it can be easily assimilated. Through the activities in the LKPD that are in the *edmodo*, it will provide opportunities for students to build their own knowledge and share their ideas through discussion sessions when mingling in small groups during learning, during these activities students will evaluate the results of the discussion and improve their thinking skills both verbally and non verbally. Through discussion activities that students will be accustomed to giving a simple explanation, then build basic skills in determining relevant sources so that they can support the explanation, make conclusions about the sources to be used, provide further explanations to maintain or improve arguments and sources he chose, and set the strategies and tactics that will be used in solving the problem. Critical

thinking skills are not skills that exist from birth, but skills that can be trained in the learning process. The series of critical thinking skills is facilitated in problem-based learning activities which consist of several phases, namely: student orientation to the problem, orienting students to learning, guiding students to conduct individual and group investigations, developing and presenting work, analyzing and evaluating problem solving processes.

4. Student Response

Table 4 shows that the response is very well seen in item statement number 1 which shows clear material presentation to be understood. Item number 2 which explains that the material is very interesting to learn. Item number 6 learning with *e-learning* developed can increase students' knowledge and knowledge. While the response with a balanced percentage can be seen in item statement number 7, *e-learning* developed can support students' critical training.

V. CONCLUSION

Based on the results of data analysis, discussion of results, and research findings concluded that *edmodo*-based *e-learning* in problem-based learning has a practical category, and is effective so that it is feasible to be used to improve critical thinking skills of fifth grade students.

Providing initial understanding of critical thinking skills to students must be done or familiarized early. It aims to make it easy for students to condition themselves in new learning situations so that students can provide active participation in critical thinking activities. Teachers need to provide guidance to students related to critical thinking skills in providing further explanations and setting strategies in problem solving through the provision of questions in the form of stimuli that facilitate the resolution of problems.

REFERENCES

- [1] Al-Rahmi, Waleed, Mugahed & Zeki, Akram, Muhammad. (2017). A Model Of Using Social Media For Collaborative Learning To Enhance Learners' Performance On Learning. *Journal of King Saud University – Computer and Information Sciences* (2017) 29, 526 - 535
- [2] Awan, Riffatun, Nisa., Hussain, Hamid., & Anwar, Nadeem. (2017) Effects Of Problem Based Learning On Student's Critical Thinking Skills, Attitudes Toward Learning And Achievement. *Journal Of Educational Research, Dept. Of Education, IUB, Pakistan* (Vol. 20 No. 2) 2017
- [3] El-Seoud, Muhammad, Samir, Abou., Taj-Eddin, Islam., Seddiek, Naglaa., El-Khouly, Mahmoud., Nosseir, Ann. (2014). E-Learning And Students Motivation : A-Research Study On The Effect Of E-Learning On Higher Education. *iJET – Volume 9, Issue 4, 2014*
- [4] Hmelo-Silver, C.E., & Barrows, H.S. (2006). Goals And Strategies Of A Problem-Based Learning Facilitator. *Interdisciplinary Journal Of Problem Based Learning, 1 (1), 21-39*
- [5] Mustaji. (2018). Pembelajaran Berbasis Masalah. Suatu Pendekatan Pembelajaran Berbasis Konstruktivistik. Yogyakarta : Absolute Media
- [6] OECD. (2014). PISA 2012 Results: What Students Know and Can Do – Student Performance in Mathematics, Reading, and Science (Volume 1). PISA. OECD Publishing.
- [7] Sinprakob, Surasak & Songkram, Noawanit. (2015). A Proposed Model Of Problem-Based Learning On Social Media In Cooperation With Searching Technique To Enhance Critical Thinking Of Undergraduate Students. *Procedia – Social and Behavioral Sciences*. 174 (2015) 2027 – 2030
- [8] Synder, Julia & Wiles, Jason. (2015). Peer Led Team Learning In Introductory Biology: Effects On Peer Leader Critical Thinking Skills. *PLoS One*. 2015; 10 (1) : e0115084

- [9] Temel, Senar., (2014). The Effects Of Problem Based Learning On Pre-Service Teachers Critical Thinking Dispositions And Perceptions Of Problem Solving Ability. *South African Journal Of Education* ; 2014; 34 (1)
- [10] Thaiposri, Patamaporn & Wannapiroon, Panita. (2015). Enhancing Student's Critical Thinking Skills Through Teaching And Learning By Inquiry-Based Learning Activities Using Social Network And Cloud Computing. *Procedia – Social and Behavioral Sciences*. 174 (2015) 2137 - 2144
- [11] Wayne, Wei-Chieh., Charlie, Cunfu., Mei-Hsin., Wang, Jenny. (2015). Technology Facilitated PBL Pedagogy And Its Impact On Nursing Student's Academic Achievement And Critical Thinking Dispositions. *TOJET: The Turkish Online Journal of Educational Technology* – January 2015, Volume 14, Issue 1
- [12] Yuan, Haobin., Kunaviktikul, Wipada., Klunklin, Areewan., Williams, Beverly. (2008). Promoting Critical Thinking Skills Through Problem-Based

Learning. *Cmu. Journal Of Social, Sciences, And Humanities*. (2008) Vol 2(2)

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