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The Influence of the *DOCAR* Model on the Critical Thinking of Junior High School Students

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ABSTRACT: The DOCAR learning model is a development model to improve the critical thinking skills of first-school students. Where this *DOCAR* learning model is a contextual problem-based model that is able to improve students' critical thinking skills. The subjects of this study were junior high school students in the even semester of the 2020/2021 academic year. Data collection techniques are carried out by observation and critical thinking skills tests. The technique of estimating data in this study is (1) instrument validity analysis. To see the validity, reliability of the instrument and analyzed using the interrater correlation coefficient and Cronbach alpha (Webb), (2) data analysis of learning implementation. To see the percentage of *DOCAR* model implementation, (3) analyze student activity. To see student activity, (4) analyze critical thinking skills. To see the influence on learning outcomes between the experimental class and the control class, it was analyzed by a t-test for two independent samples (independent sample t-test). This analysis is carried out by comparing the significance values. From the results of the study, it was concluded that there is an influence of the *DOCAR* learning model on critical thinking ability.

KEYWORD: Critical Thinking Ability, *DOCAR* Learning Model

INTRODUCTION

Education in Indonesia in implementing the 2013 curriculum revised in 2018 prioritizes (1) strengthening character education, (2) mastery of literacy, and (3) strengthening *high-order thinking*. The strengthened character is focused on (1) religiosity, (2) nationalism, (3) independence, (4) mutual aid, and (5) integrity. Meanwhile, mastery of literacy is emphasized in 21st Century literacy, which is summarized in the acronym 4C, namely (1) *creative*, (2) *critical thinking*, (3) *communicative*, and (4) *collaborative* (Ariyana et al., 2018). It is possible that mathematics lessons in schools have implemented this curriculum. So, it can be concluded that the government has overhauled the curriculum to prepare education in Indonesia must be able to compete in the 21st century.

However, the reality is that learning activities in schools, especially in the city of Lamongan, are still considered not optimal, both public and private schools. The cause of the non-optimal learning can be seen from the teacher or student side, because five things are: (1) learning is still one-way and has not been directed to an active learning process to build their own knowledge, (2) students in understanding problems have never checked the truth in determining what is meant but they immediately answer the problem, (3) students still do not use critical thinking in solving mathematical problems, (4) students in solving problems still do not connect the fragments of knowledge that have been learned with the problems faced, (5) students after being able to solve the problem, most of them do not re-examine the answers they worked on whether they are correct or not.

According to Xavier, it is stated that the learning process is less interesting because of two things, namely: (1) the learning process does not refer to the curiosity of the learner to dissect issues around the social environment. The notion that the learner is a blank paper or a person who passively accepts from the learner's presentation, is now irrelevant. (2) the learner positions himself as a person who patronizes the learner, has not acted himself as a facilitator by paying attention to the knowledge constructed by the learner that applies correctly to every circumstance. They go to school, but their way of learning is simply to listen to the teacher's description and make less effort to understand the content of the subject seriously (Mustaji, 2017).

Based on the analysis of the learning process above, both in the form of learning models and learning theories that are still used in applying learning in schools, the advantages, and disadvantages of learning models and learning theories are described in table 1.1 as follows.

Table 1. Advantages and Disadvantages of Learning Models and Theories of Learning in Schools

	Excess	Debilitation
Teacher centered learning	Can be effectively applied in large and small classes The teacher can control the content of the material and the order of information received by the students so that they can maintain focus on what the students have achieved Very helpful for students who do not like to read or who do not have skills in compiling and interpreting information Students concentrate on the results of a task and not on the techniques in producing it Students who are unable to orient themselves can still excel if this model is used effectively	Learning is still one-way and has not been directed to the active learning process to build its own knowledge Students in understanding the problem have never checked its truth in determining what is meant but they directly answer the problem Students still do not use critical thinking in problem solving Students after being able to solve the problem, most of them do not re-examine the answers they are working on whether they are correct or not
Piaget's Theory of Learning (Rusman, 2017)	Students get guidance from the teacher at the time of study Brain-centered learning Students learn according to the stage of their development	The cognition functioning ability of each student is considered the same Students cannot find their own learning style The quantity of cognition is emphasized more than the quality
The Theory of Learning Constructivism (Rusman, 2017)	Learning is always active and can find a way of learning that suits him Produce individuals or children could think to solve every problem encountered Strengthening the acquisition of new knowledge for learners	Teacher intervention is only a little Students only get the basic concepts from the learning material so they must be able to develop them themselves The provision of theories is considered less important
Bruner's Theory of Learning (Bruner, 1977)	Learning discovery can be used to test whether learning is already meaningful The knowledge gained by the learner will be left behind for a long time and easy to remember Learning discovery is very necessary in problem solving because it is desired in learning so that the learner can demonstrate the knowledge received Transfers can be improved where the generalizations have been discovered by the learner himself rather than presented in the finished form The use of learning discovery may have a tendency in creating learning motivation Improves the reasoning of the learner and the ability to think freely	Learning this discovery requires high intelligence. When less intelligent the results are less effective This kind of learning theory takes a long time and if it is less guided or less directed, it can cause chaos and blurring of the material being studied

From table 1 above, the researcher wants to combine the three theories so that the learning process is optimal and in accordance with the challenges of 21st century education. The learning process can be optimal if (1) the active role of students in constructing knowledge meaningfully, (2) the importance of making a connection between ideas in constructing meaningfully, (3) linking ideas with new information received, (4) students experience and face the challenges of scientific problems, thinking, getting used to thinking, taking actions related to efforts to solve problems and think critically. A learning model that is relevant for this context and fits the challenges of 21st century education is *the DOCAR* learning model. The *DOCAR* learning model is a learning to improve critical thinking and mathematical problem-solving skills. The characteristics of *the DOCAR* learning model are: (1) have objectives

(the objectives achieved in this *DOCAR* learning are to prioritize the active role of students in constructing knowledge, collaborating in combining knowledge), (2) having a theoretical basis (Constructivism leads us to compile teaching and learning experiences), (3) having a learning syntax (*the DOCAR* learning model refers to the basis of the theory of constructivism, the theory of Jean Piaget, and the theory of Jerome S. Bruner. This model is designed in five phases that include the stages *of do, observation, construction, association, and reflection*), (4) having a learning environment (as a form of implementation learning the *DOCAR* model is the formation of a learning environment Phase 1: *Do* (let's do), Phase 2: *Observation* (check what you have done), Phase 3: *Construction* (make planning), Phase 4: *Association* (connect with the knowledge you have), Phase 5: *Reflection* (whether you have done well)), (5) Characteristics of the *DOCAR* Model (*the DOCAR* learning model is a combination of the basic theory of constructivism, the theory of Jean Piaget, and the theory of Jerome S. Bruner. Development is carried out to prioritize the active role of students in constructing knowledge, collaborating in combining knowledge, practicing reasoning in problem solving).

Seventika et al., (2018) argues that reasoning is a mental process that deals with and compares between facts, ideas or events and facts. Critical Thinking defines critical thinking as "an intellectual disciplinary process that actively and skillfully conceptualizes, applies, analyzes, synthesizes, and or evaluates information collected from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to beliefs and actions (Snyder & Snyder, 2008). Thinking is a general term used to cover various activities ranging from daydreaming to reflection and analyzing several synonyms listed in Robert's thesaurus to think some of them, namely believing, thinking, understanding, liking, pondering, inspiring, and many others (Cummings, 1977). Meanwhile, critical thinking according to Brookfield, King, and Kitchener in (Cotter & Tally, 2009) is a skill such as evaluating sources of information, challenging assumptions, understanding context, analyzing arguments, and using metacognition.

Critical thinking is a basic skill that develops interesting early learning exercises and activities in which critical thinking is based on the updating of knowledge analyzing differences and comparisons forming similarities and differences observing and identifying causal relationships extracting ideas from examples supporting ideas with examples of evaluating the correctness of usefulness values of positive and negative impacts (Florea & Hurjui, 2015). As explained in (Paul & Elder, 2006) critical thinking used in productive life one needs to internalize and use intellectual standards to assess thinking by thinking critically.

According to Bissell & Lemons, (2006) basic knowledge does not require critical thinking skills, secondary understanding expands basic knowledge but also does not require critical thinking and application requires a high level of thinking about the knowledge that students build, where high-level skills correctly require knowledge and understanding of the content that makes thinking should be encouraged. Critical thinking is an understanding of the relationship of language with logic that leads to the ability to analyze criticizing and advocating ideas to reason inductively and deductively reaching a factual conclusion or judgment based on reasonable conclusions in which are drawn from unambiguous statements of knowledge and beliefs (Paul R. W., 2012). Critical thinking is best understood as the ability to take their own mindset experts who require the development of healthy criteria and standards analyzing their own judgment of thought by using criteria as a standard to improve its quality (Paul & Elder, 2014).

From the point of view of cognitive scientists, the mental activity commonly called the importance of critical thinking is part of three types of thinking: reasoning, making judgments, and decisions and problem solving. critical thinking is carefully thinking the logic of weighing the evidence at hand and deciding whether to believe what is said (Willingham, 2008). According to Vincent Ruggiero on the art of thinking describes thinking as any mental activity helping to formulate or solve problems making decisions and fulfilling the desire to understand in search of answers while achieving meaning. Critical thinking itself is thinking to solve problems analyzing problems or making decisions (Murawski, 2014). Experts use metaphorical phrases of the critical spirit in the positive sense by which they mean curiosity that investigates the sharpness of mind, dedication, zeal for reason, and hunger or desire for reliable information (Facione, 2020).

So it can be concluded that critical thinking is an activity of reasoning, formulating, and making decisions and fulfilling the desire to understand in search of answers. Based on the explanation above, researchers want to examine how much influence the *DOCAR* model has on the critical thinking of junior high school students in mathematics subjects.

RESEARCH METHOD

This type of research using quasi-experiments or pseudo-experiments is a design that has a control group, so it cannot function fully to control the external variables that affect the implementation of the experiment. Meanwhile, the research design used is a pretest-posttest control group design only in this design the experimental group and the control group are not randomly selected. In this design, both the experimental group and the control group were compared, although the group was selected and placed without going through random. Two existing groups were given a pretest, then given treatment, and finally given a posttest. The pattern of this study is as follows.

Pre-test	***Treatment***	***Post-test***	
O_1	X	O_2	Experimental class
O_3	Y	O_4	Control classes

Information:

O_1 = initial test (pretest), to measure the critical thinking ability of students before treatment is given

O_2 = final test (posttest) to measure the ability to master the material

X = treatment with docar model deployment

Y = treatment using varied lecture learning

Before the experiment is carried out, validation of the learning tools to be used is first carried out. Validation is carried out by two validators consisting of two experts, namely learning technology experts and material experts in the field of study. From the validation results that have been assessed by the two experts, then the validation results will be calculated the rating of each indicator, which then the rating results are categorized according to the assessment scale criteria. The location where this study was carried out was in junior high school 1 Lamongan. Because this school is still entering offline even though it is still a wave 2 pandemic. The research time was carried out in the even semester of the 2021/2022 even school year in mathematics class VIII subjects, the material for building a flat side room.

In every study, there is always a variable that is said by Sugiyono (2017)"an attribute or trait or value of a person, object or activity that has certain variations set by the researcher to study and then draw conclusions". These variables can be explained as follows: (1) the free variable in this study is the use of the *DOCAR* learning model. One group was given the learning process of the *DOCAR* model while the second group used the traditional model / lectures varied. (2) the bound variable in this study is the ability to think critically. The success rate can be measured by giving tests after the learning process is carried out.

The focus of the research is to find out whether the influence of using the *DOCAR* learning model can improve students' critical thinking skills. The improvement of students' critical thinking skills can be seen from the indicators that must be met, namely: (1) interpretation, (2) basic support, (3) inference, (4) clarity, (5) overview.

The sampling technique in this study was simple random sampling. Simple random sampling is a sampling technique that provides equal opportunities for individuals who are members of the population to be selected as samples, in research on *the DOCAR* learning model. Based on the consideration of sampling using random techniques from several classes, the average ability is shown through the final semester exam scores. The final score of the semester exam shows that the student's average score is 7.2. Then it was carried out randomly with the results obtained, namely class VIII C as many as 15 students, as a control class and class VIII B as many as 15 students, as an experimental class to be given treatment.

Data collection techniques are carried out by observation and tests. Observations were made to see how the teaching and learning activities of teachers and students at each meeting and were also used as an indicator of the implementation of the *DOCAR* learning model. With this observation, it can clearly know how the teacher's activities form when teaching in front of the class, and how students respond to mathematics subjects, besides that it can also be known how far the effectiveness of the *DOCAR* learning model is. The second data collection technique in this study is the measurement technique for the use of tests. The data in this study were obtained from the results of measuring critical thinking ability using tests given to each student both from the control class and experimental class. This test is carried out twice, namely during pretest and posttest.

The instruments developed in this study consisted of critical thinking ability test questions and observation sheets on the implementation of learning using the *DOCAR* learning model. The observation sheet is divided into 2 teacher activities in the implementation of learning and student activities.

This learning implementation observation sheet is used to determine the implementation of learning implementation plans using the *DOCAR* model and traditional/varied lectures and test the validity of the learning implementation plan that will be used in research related to stages in learning using the *DOCAR* learning model and traditional/varied lectures. Here are the observed aspects of teachers in *DOCAR* learning in table 1.

Table 2. Aspects of Observing the Implementation of Learning

No	Fase	Observed Aspects
1	Phase 1: *Do* (let's do it)	Conveying learning objectives and providing motivation to students by providing contextual problems.
		Grouping students into several heterogeneous groups of 5 – 6 students.
		Performs identification of problems related to contextual problems.
		Students identify problems related to contextual problems.
2	Phase 2: *Observation* (check what you've done)	Guiding students to collect information, study, and pay attention to problems in teaching materials.
		Students can re-examine what has been done according to what is meant in the problem.

No	Fase	Observed Aspects
3	Phase 3: *Construction* (make planning)	Guiding students to analyze information and construct steps in problem solving.
		Students can construct problem-solving plans and are able to complete them.
		Guiding students to solve problems.
		Each student can have different construction results.
4	Phase 4: *Association* (connect with the knowledge you have)	Encourage students to collaborate knowledge in discussions with the process gradually rather than suddenly and share the results of individual work.
		Students discuss and explain the reasons why to use the steps they make.
		Guiding students to make a summary of the results of the discussion and be ready to be presented in a presentation in class.
		Students can be trained in reasoning through discussion activities in groups, namely by expressing opinions and providing reasons about the opinions expressed.
5	Phase 5: *Reflection* (have you done well)	Guiding students to check the results of their work by checking the process. If there are still differences, they can discuss and express their respective opinions. It is not ruled out that it can be solved in other ways.
		Appoint one of the group members to present the results of his discussion in front of the class.
		Students present the results of group discussions.
		Guiding students to make conclusions.

Meanwhile, the observation sheet of student activity in the learning of the *DOCAR* model is the aspects observed by the aspects observed as follows in table 2.

Table 3. Aspects of Student Activity Observation

No	Student activity in *DOCAR* learning
1	Listening/paying attention to the teacher/friend's explanation actively
2	Identifying problems related to contextual problems
3	Collecting information, reviewing, and examining contextual problems
4	Re-examine what has been done according to what is meant in the problem
5	Analyzing information and constructing problem-solving plans
6	Linking fragments of knowledge that have been learned with problems encountered by gradual processes instead of suddenly
7	Solving problems/being able to construct problem-solving plans and being able to solve and have different construction results for each student
8	Discuss in constructing a problem-solving plan
9	Collaborate knowledge in discussions with the process gradually rather than suddenly and share the results of individual work and is expected to criticize the opinions of friends and explain the reasons why to use the step
10	Re-examine the results of his work by examining the process. If there are differences, they can discuss and express their respective opinions
11	Drawing conclusions of a procedure or concept
12	Discuss/ask questions, express opinions/ideas to friends or teachers

The second instrument is the use of critical thinking ability test questions, in the form of observation instructions and answering questions by referring to questions with categories of material that have been taught to find out students' critical thinking abilities before the DOCAR learning model is applied and after application. This indicator of critical thinking refers to the opinions of Ennis, Facione, Fisher, and Cottrell. The aspects of the ability to think are: (1) interpretation. Identify and understand the problem appropriately, (2) basic support. Provide reasons in favor based on relevant situations and facts, (3) inference. Able to give conclusions precisely or logically, (4) clarity. Using a more advanced explanation of what is intended in the conclusions made, (5) overview. Thoroughly re-examine the decisions taken.

The technique of estimating data in this study is (1) instrument validity analysis. To see the validity, reliability of the instrument and analyzed using the interrater correlation coefficient and Cronbach alpha (Webb), (2) data analysis of learning implementation. To see the percentage of *DOCAR* model implementation, (3) analyze student activity. To see student activity, (4) analyze critical

thinking skills. To see the influence on learning outcomes between the experimental class and the control class, it was analyzed by a t-test for two independent samples (independent sample t-test). This analysis is carried out by comparing the significance values.

RESEARCH RESULT

Based on the results of statistical tests, the results obtained will be described as follows.

1. Results of assessment of the validity and reliability of the instrument

The validity test carried out is to see the accuracy of an instrument in measurement. While the reliability test is used to determine the consistency of the measuring instrument, whether the measuring instrument used is reliable and remains consistent if the measurement is repeated. The results of the validation of the instruments assessed by the validators are presented in table 4. the following.

Table 4. Results of Instrument Validity and Reliability Test

No	Test	Scale Statistics	Category
1	Validity (r_α)	*Single Measures ICC*	3,6 > 2,4 Valid
2	Reliability (α)	*Cronbach's Alpha/Average Measures ICC*	0,6 ≤ 0,96 ≤ 1 Reliabel

Based on table 4 above, the validity assessment results show valid, while the reliability assessment results show reliability. In other words, the instrument can be used in research.

2. The results of the percentage of learning implementation

The observation of the implementation of learning is carried out to see how far the implementation of the *DOCAR* learning model is carried out. The results of the percentage of learning implementation are presented in table 5 below.

Table 5. Results of The Percentage of Learning Implementation

Description	Observer 1	Observer 2	Sum
Number of steps performed	51	51	102
percentage of implementation (%)	94%	94%	94%

Based on table 5, it shows that each step carried out during three meetings averaged 102 and the percentage of implementation was 94%. Based on the provisions of the assessment criteria used where the implementation of the learning model is stated to be carried out properly if the % of implementation ≥ 75%. This means that the level of implementation of the *DOCAR* learning model in mathematics subjects to improve critical thinking has been carried out very well.

3. The results of the percentage of student activities

Observation of student activities is carried out to see student activities in the implementation of the *DOCAR* learning model. The results of the percentage of student activity are presented in table 6 below.

Table 6. Student Activity Percentage Results

No	Student Activities	Amount of Turus	Average	Percentage (%)	Criterion
1	Listening/paying attention to the teacher/friend's explanation actively	310	155	97	Excellent
2	Identifying problems related to contextual problems	306	153	96	Excellent
3	Collecting information, reviewing, and examining contextual problems	296	148	93	Excellent
4	Re-examine what has been done according to what is meant in the problem	279	139.5	88	Good
5	Analyzing information and constructing problem-solving plans	276	138	87	Good
6	Linking fragments of knowledge that have been learned with problems encountered by gradual processes instead of suddenly	275	137.5	86	Good

No	Student Activities	Amount of Turus	Average	Percentage (%)	Criterion
7	Solving problems/being able to construct problem-solving plans and being able to solve and have different construction results for each student	285	142.5	90	Excellent
8	Discuss in constructing a problem-solving plan	291	145.5	92	Excellent
9	Collaborate knowledge in discussions with the process gradually rather than suddenly and share the results of individual work and is expected to criticize the opinions of friends and explain the reasons why to use the step	285	142.5	90	Excellent
10	Re-examine the results of his work by checking the process. If there are differences, they can discuss and express their respective opinions	263	131.5	83	Good
11	Drawing conclusions of a procedure or concept	290	145	91	Excellent
12	Discuss/ask questions, express opinions/ideas to friends or teachers	302	151	95	Excellent
Total Number of Percentages Average				**91**	**Excellent**

Based on the results of the percentage of observations of student activity during broad-scale trial learning in table 4.19 above that which has excellent criteria on indicators 1, 2, 3, 7, 8, 9, 11, and 12. While with good criteria in indicators 4, 5, 6, and 10. Overall, the average percentage of student activity observations can be said to be very good with a percentage of 91%.

4. The results of the analysis of the question item

The purpose of the question item analysis is to see which items or items of the question are worth using, correcting, or eliminating. The research instrument analyzed is in the form of an essay test question consisting of two question items. The analysis of the question items including the results of the validity test, the results of the reliability test, difficulty, and the differentiation of the questions are presented in table 7 as follows.

Table 7. Student Activity Percentage Results

r-table (**side** sig 5% & teste 12) = 0.576					**Overall Reliability**: 0.915 (Reliabel)		
No Soal	**Difficulty**		**DifferentIal Power Of The Problem**		**Validity of the Question**		**Conclusion**
	Index	**Information**	**Index**	**Information**	**Index**	**Information**	
1	0.305	Difficult	0.210	The problem is accepted but needs to be fixed	0.781	Valid	Considered
2	0.392	Keep	0.400	Matter of being well received	0.954	Valid	Accepted

Based on table 7, it can be seen, that all question items are declared valid with an instrument reliabilits of 0.915, thus it can be said that the question is worth using and the instrument has high reliability.

5. Normality test results learning outcomes

To analyze the influence on learning outcomes between the experimental class and the control class, a t test was used for two *independent samples (independent sample t test*) with the help of SPSS software. Before the t-test is carried out for two free samples (*independent t-test samples*), a condition test is first carried out. The condition test used is the normality test. The normality test uses the Shapiro-wilk test (SPSS *software*).

The basis for decision making in this normality test is as follows.

1. If sig. (significance) or probability value < 0.05, then the data is abnormally distributed.
2. If sig. (significance) or probability value > 0.05, then the data is normally distributed.

The results of the normality test analysis using the Shapiro-wilk test are shown in table 8 as follows.

Table 8. Learning Outcomes Normality Test Results (*pretest-posttest*)

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.118	15	.200*	.973	15	.895
Posttest	.153	15	.200*	.944	15	.433

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the results of the normality test of learning results in table 8 above, it is known that the significance value of Shapiro-wilk for *pretest* and *posttest* data is greater than 0.05, so it can be concluded that the data are normally distributed.

6. Independent Test Results *Sample t-test* Learning Outcomes

The t-test for two independent *samples (independent sample t-test*) was carried out to see if there was an average influence of learning outcomes of critical thinking ability between the experimental class and the control class. The basis for making decisions in *the independent test of the t-test sample* is as follows.

1. If the value is sig. (2-tailed) > 0.05 then H_0 is accepted and H_1 is rejected, which means that there is no influence on the average learning outcomes of critical thinking skills between the experimental class and the control class.
2. If the value is sig. (2-tailed) < 0.05, then H_0 is rejected and H_1 is accepted, which means that there is an average influence of the learning outcomes of critical thinking skills between the experimental class and the control class.

The results of the independent statistical test analysis *of the t-test sample* are shown in table 9 as follows.

Table 9. Independent Test Results *Study Outcomes t-test Sample*

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Hasil_Belajar	Equal variances assumed	.005	.944	5.666	28	.000	10.867	1.918	6.938	14.796
	Equal variances not assumed			5.666	27.967	.000	10.867	1.918	6.938	14.796

Based on the results of *the independent test of the t-test sample* of learning results in table 9 above in the *equal variances assumed* section, the sig value is known. (2-tailed) of 0.000 < 0.05, then as the basis for making decisions in the *independent test of the sample t test*, it can be concluded that H_0 is rejected and H_1 is accepted. Thus, it can be concluded that there is a significant (real) influence on the average learning outcomes of critical thinking ability between the experimental class and the control class.

DISCUSSION

Based on the results of the study, it is theoretically concluded that the instruments used in the study have met the validity criteria with revisions and are suitable for use in research. Empirically, based on the results of observations of learning the *DOCAR* learning model in the experimental class, aspects of the *DOCAR* learning model have not been carried out in junior high school 1 Lamongan. namely: a) the activity of re-checking what has been done in accordance with what is meant in the problem; (b) activities to analyze information and construct problem-solving plans; (c) the activity of relating the fragments that have been studied with the problems encountered by a gradual process, not suddenly; (d) the activity of re-examining the results of its work by examining the process. If there are differences, they can discuss and express their respective opinions. This activity is already good, but it will be even better if it needs habituation/motivation by the teacher. The problem is that if there is no habituation / motivation from the teacher, students will forget about this matter.

Before the *pretest* is carried out, the teacher emphasizes the course of the learning process later that the implementation of learning using the *DOCAR* model, supported by rpp, teaching materials, and media that have been adapted to the *DOCAR* model.

Students' critical thinking skills and problem-solving skills in the *DOCAR* model are developed through experimentation and problem investigation in the form of story questions accompanied by images in teaching materials. Initially, students find it difficult and hesitant when answering *the pretest* and the teacher gives directions so that in understanding the question it needs to be read repeatedly and identified in detail to answer correctly. At the time *of the posttest* because students were already familiar with the learning *of the DOCAR* model that applies and trains students to have critical thinking and problem-solving skills, they answered it without finding it difficult and there was no hesitation anymore and the results met above the minimum completion criteria.

The use of the *DOCAR* learning model can improve critical thinking skills. To improve students' critical thinking skills, students are taught to train the ability to identify and understand problems appropriately (*interpretation*) in the teaching materials that have been given. Then students are trained to re-examine what has been done and provide supporting reasons based on the problem (*basic support*). After that, students are taught how to construct problem-solving steps and can give logical conclusions (*inference*). Furthermore, students are taught to collaborate in a group and can account for the arguments/conclusions they have made to get more complex conclusions (*Clarity*). At the end, students are taught *an overview* by re-examining the overall answer to the decisions taken. Then the teacher gives a review and clarification of what the students and groups are working on.

In the experimental class, there was an increase in students' critical thinking skills from meeting to meeting, especially in *the indicators of interpretation*, *basic support*, *inference*, and *overview*, this is because students are familiar with the *DOCAR* learning model process from previous meetings. Findings like this in line with his opinion Ennis (1981) critical thinking has the aim of exploring the thought process itself, thinking in an organized way about the process of giving reasons, thus helping to make the best decision on the problem at hand according to the information heard, read, and experienced.

CONCLUSION

The conclusion of the results of the study on the influence of the *DOCAR* learning model on the critical thinking of junior high school students in junior high school 1 Lamongan about mathematics material builds a flat side room. That the *DOCAR* learning model can improve critical thinking skills for students can be seen from the average percentage of implementation of the *DOCAR* learning model is 94% categorized as very good, the results of the percentage of student activity of an average of 91% are categorized as very good, and effective (the results of the effectiveness test of critical thinking ability show the results of *an independent test sample* t test where learning outcomes In table 9 it can be concluded that there is a significant (real) influence on the average learning outcomes of critical thinking ability between the experimental class and the control class.

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