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Effect of Learning Model Double Loop Problem Solving Using Powerpoint Media on Critical Thinking Skills and Learning Results of Social Studies in Elementary School Students

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Abstract:- This study aims to analyze the effect of the double loop problem solving learning model assisted by powerpoint media on critical thinking skills of elementary school students and to analyze the effect of the double loop problem solving learning model assisted by powerpoint media on learning outcomes of elementary school students. This research is an experimental research with a pretest posttest control group design. The subjects of this study were fourth grade students of SD Muhammadiyah 16 Surabaya. Data collection techniques through student activity observation sheets and student analysis skills tests. The analysis technique used is the t test. In this case the t test is carried out twice, firstly, to determine the initial conditions of the experimental group and control group and second to determine the conditions after being given treatment. The results showed that: first, based on the t test analysis of critical thinking skills, the value of t count> t table (7.439> 1.676) and the results of sig. 2 tailed valued at 0.000 <0.05 with df = 50. Second, the t test analysis of learning outcomes shows the value of tcount> ttable (6.472> 1.676) and the results of sig. 2 tailed valued at 0.002 <0.05 with df=50.Thus, it can be stated that there is influence double loop problem solving learning model assisted by powerpoint media on critical thinking skills and social studies learning outcomes of elementary school students

***Keywodrs**:- Double Loop Problem Solving Learning Model, Powerpoint Media, Critical Thinking Skill, Learning Result.*

I. INTRODUCTIAN

Education has an important role for human life, because education can affect the development of behavior and human insight in all aspects of personality in life. Therefore, the implementation of the educational process should be carried out properly so that educational goals can be achieved properly. National education in Indonesia has the aim of improving Indonesia's human resources completely by implementing the learning process in both formal and informal environments. One of the formal education is elementary school education. The purpose of education in elementary schools according to Mikarsa (2007:1.13) is "the formation of the basic personality of students as whole Indonesians in accordance with their level of development. fostering basic understanding and ins and outs of science and technology as a foundation for learning at a higher level of education and living in society ". Based on these objectives, the implementation of the learning process in elementary schools should be carried out as well as possible so that the objectives of education in elementary schools can be achieved as expected.

In general, the problem of decreasing quality of learning that is often faced today is the lack of creativity of teachers in choosing learning models and media to support learning activities. Teachers are more likely to use conventional methods in learning activities, so that students become passive. Another factor that affects is that the teacher dominates during learning, students only listen to the information conveyed by the teacher, this has an impact on not achieving meaningful learning for students. Students are less able to explore thinking skills, because there is no learning that presents problem solving activities, which are able to activate students to be directly involved in learning activities.

The factors that influence the success in learning elementary school social science can be grouped into external and internal factors. One of the external factors that influence success in learning is the learning model used by the teacher. The selection of learning models and learning media will have a big influence on the success of students in receiving a lesson. Primary school social science learning should be packaged in fun activities and involve the activeness of students, so that in primary school social science learning not only teachers play an important role, but also the active role of students in learning activities.

Social science learning related to critical thinking skills in identifying and analyzing problems will be able to activate students during the learning process. Santrock (2006:316) defines that critical thinking is interpreting problems more deeply, keeping the mind open to all different approaches and views, and thinking reflectively instead of just accepting statements and implementing them without understanding and evaluation. The ability of students to think critically is also one of the goals of social science learning in the 2006 National Education Ministerial

Regulation which states that students must have the basic ability to think logically and critically, curiosity, and solve problems in social life.

Critical thinking can be achieved more easily if a person has the dispositions and abilities that can be considered as the characteristics and characteristics of critical thinkers. The opinion of Larsson (2017) states that critical thinking can be interpreted as someone's attempt to check the truth of information using evidence, logic and awareness of bias. Another opinion was put forward by Sudiarta (2009) that the ability to think critically has been proven to prepare students to think in various disciplines because the ability to think critically is a cognitive activity carried out by students by dividing how to think in real activities by focusing on making decisions about what one believes or does. The ideal critical thinker is open minded. (Beistle, Smith, & Nagel, 2006).

This critical thinking ability is very important for students to have because it includes a process of mental activity in receiving, processing, analyzing, synthesizing, and evaluating the information obtained to make decisions or actions in solving problems. The problems that will be faced by students are not only in lessons, but in everyday life there are also many problems that will be faced by students. So that students are required to have the ability to think critically so that they can make the right decisions or actions in solving any problems faced.

Someone who has the ability to think critically is able to relate things more accurately. He is accustomed to using his critical thinking skills to research beforehand, connecting with logic the various incoming information so as not to be easily influenced. The ability to think critically in everyday life can prevent a person from negative influences and help in the process of self-actualization in social life, education and work. Of course, the level of critical thinking skills in each person is different, it can be seen as a continuum that extends from the lowest level to the highest level (Paul & Elder, 2005).

Observing from the learning conditions described above, the researcher concluded that the factors that caused some students not to complete social science learning and their lack of critical thinking skills were learning activities that were still monotonous and conventional. Such learning conditions, if left unchecked, can make students' abilities less optimal in thinking openly and critically in responding to a problem that exists in society, because the space for students to express opinions, ideas, and play an active role in learning is limited. Such learning can also reduce students' learning interest and motivation which will affect student learning outcomes. According to Setyorini (2011: 52) that learning that does not actively involve students causes an imbalance in the cognitive, affective and psychomotor abilities of students. Most of the students are also unable to connect what is learned with how this knowledge will be used or used.

Furthermore, the learning model used by the teacher is not correct. In response to this, it is necessary to hold an experiment testing a learning model that can help rectify student deficiencies in learning social studies and become input for teachers to be used in social studies learning with different materials. So, the researcher will lead to the experiment of applying learning models based on the concepts and objectives of science in accordance with the problems at hand, especially on the theme of various jobs. The problem faced is the lack of understanding of students, it is necessary to learn that emphasizes the process of understanding to students. Understanding is the ability to see the relationships between various factors or elements in a problematic situation (Hamalik, 2013:48). When viewed from this understanding, it is necessary to have a problem-based learning model and students are directed to look for the core causes of the problem. The search for the cause and effect of the core of the problem will train students not to learn by memorizing methods but to understand the concepts and learning materials of social science well. One model that fits the emphasis on understanding the concepts and materials is the double loop problem solving model.

The use of strategies, methods and approaches sometimes arises problems in the field where students tend to be bored and lack motivation in learning. Lack of motivation in learning results in students being less active so that enthusiasm for learning and learning activeness is less which results in relatively low or less than optimal learning outcomes. One way to overcome this problem is to apply a double loop problem solving learning model. This is in accordance with the opinion of Fatmala, et al. (2016) which states that the application of the double loop problem solving learning model can improve cognitive learning outcomes.

Double loop problem solvingis a type of problem-solving approach that emphasizes the search for the main causes of the problem, involving creativity and critical thinking (Jufri, 2015). Learning begins with analyzing problems, looking for the causes of problems, analyzing the causes and solving problems according to the analysis that has been done. This method is also a variation method of problem solving which is expected that students can think creatively so that they can improve their reasoning skills. Yuliana et al., (2018) reported in their research that the use of the appropriate double loop problem solving learning model can improve student learning achievement.

Shoimin (2014) explains double loop problem solving is a variation of learning with problem solving with an emphasis on finding the main causes of problems. The process of finding the cause of this problem makes students more active in finding the cause, then from the stage of finding the cause of a problem, students' understanding of the problem and material will increase and be able to solve the problem properly and correctly. In addition, the double loop problem solving model also emphasizes the problem-solving process because this model is the development of a problem-based learning model. According to John Dewey (in Syah, 2013) learning to solve the problem takes place as

follows: the individual realizes the problem when he is exposed to situations of doubt and obscurity so that he feels some kind of difficulty. The goal is to acquire cognitive abilities and skills to solve problems rationally, straightforwardly, and thoroughly. The explanation above shows that by learning problem solving students will gain cognitive abilities and skills. The cognitive domain is related to thinking activities, which includes the ability to solve problems.

Thus it has been explained that the ability to solve problems has a role in increasing students' critical thinking skills and influencing student learning outcomes, so that if students have a high cognitive level, they will have high hopes for their learning success. That is, if students can succeed in learning, students can be sure to get optimal learning outcomes. This is in line with Facione (1990) that the achievement of student learning outcomes, especially critical thinking requires an appropriate learning model. Critical thinking skills are the key in education to solve a problem, this has several indicators. These indicators must be achieved through the learning model to be applied.

Furthermore, the effectiveness of double loop problem solving learning can also be improved by adding learning media assistance. Media is an inseparable part of the teaching and learning process in order to achieve educational goals in general and learning objectives in schools in particular (Arsyad, 2013). One of the media which is suitable with social studies material is powerpoint learning media. There are many advantages of PowerPoint learning media if its application is in accordance with the material to be delivered. As the subject matter that will be used as experimental material is about various jobs, then using a double loop problem solving model assisted by powerpoint learning media on various jobs will add meaning to the learning process. This is made clear by the opinion of Daryanto (2015) that 1) powerpoint learning media can complement the basic experiences of students when they read, discuss, practice and so on; 2) powerpoint learning media can describe a process accurately and can be presented repeatedly if needed; 3) motivate students to learn; and 4) can display an event in large or small groups. Based on the explanation of the advantages of powerpoint learning media assistance in learning, student understanding can be improved and will have an impact on the optimal achievement of student learning outcomes. 2) powerpoint learning media can describe a process accurately and can be presented repeatedly if needed; 3) motivate students to learn; and 4) can display an event in large or small groups. Based on the explanation of the advantages of powerpoint learning media assistance in learning, student understanding can be improved and will have an impact on the optimal achievement of student learning outcomes. 2) powerpoint learning media can describe a process accurately and can be presented repeatedly if needed; 3) motivate students to learn; and 4) can display an event in large or small groups. Based on the explanation of the advantages of powerpoint learning media assistance in learning, student understanding can be improved and will have an impact on the optimal achievement of student learning outcomes.

This model involves students' creativity and critical thinking, emphasizes problem solving in two different but interrelated solving loops and prioritizes finding the main causes of a problem which will be the basis for determining the most important solution in solving a problem (Huda, 2015). : 301). The explanation of the effectiveness of the double loop problem solving model assisted by PowerPoint learning media is also supported empirically. Among them are Mas'ad et al. (2016) who concluded the results of double loop problem solving learning affects student learning outcomes. The results of another study from the journal Roliyani (2016) show that the double loop problem solving model can improve student learning outcomes at SD Negeri 016532 Punggulan.

The objectives of this study were (1) to analyze the effect of the double loop problem solving learning model assisted by PowerPoint media on critical thinking skills of elementary school students, and (2) to analyze the influence of the double loop problem solving learning model assisted by powerpoint media on learning outcomes of elementary school students.

II. THEORETICAL FRAMEWORK

- *Double Loop Problem Solving Learning Model*

The Double Loop Problem Solving learning model is one part of the problem-based learning model. As explained by Budiyanto (2016), the double loop problem solving model is a learning model adopted from the problem solving learning model. Model of problem solving learning (problem solving method) is not just a teaching method but also a method of thinking, because in problem solving you can use other methods starting with looking for data to drawing conclusions. This model involves the creativity and critical thinking of students, emphasizing problem solving in two different but interrelated solving loops and prioritizing finding the main causative factors of a problem which will be the basis for determining the most important solution in solving a problem (Huda, 2015). Double Loop Problem Solving according to Jeff Dooley (in Jufri, 2015) is a decision made about what information is collected, how to interpret it, and how the best information should be used. Double Loop Problem Solving is a type of learning model that focuses on problem solving that emphasizes the search for the main cause of the problem, involving creativity and critical thinking. 2015) are decisions made about what information to collect, how to interpret it, and how the best information should be used. Double Loop Problem Solving is a type of learning model that focuses on problem solving that emphasizes the search for the main cause of the problem, involving creativity and critical thinking. 2015) are decisions made about what information to collect, how to interpret it, and how the best information should be used. Double Loop Problem Solving is a type of learning model that focuses on problem solving that emphasizes the search for the main cause of the problem, involving creativity and critical thinking.

Double Loop Problem Solving is a variation of learning with problem solving which is oriented towards finding the main causal (cause) of the problem. It concerns the answer to the 'why' question. Furthermore, the problem is resolved by eliminating the distance that causes the problem to arise (Siahaan, 2017). Double Loop Problem Solving is a learning model that is widely used to support a learning approach that invites students to be active in teaching and learning activities (Budiyanto, 2016).

The Scope of Learning Model double loop problem solving is a learning environment in which using problems to learn. Namely, before students start lessons, they are given a problem. The problem is posed in such a way that students discover their own learning needs about new knowledge before students can solve the problem. The main characteristic of double loop problem solving is that learning is centered on providing problems to be discussed by students to train students to think creatively and achieve all competencies in learning mathematics (Shoimin, 2013).

Double loop problem solving is a learning environment in which problems are used to learn. Namely, before students start lessons, they are given a problem. The problem is posed in such a way that students discover their own learning needs about new knowledge before students can solve the problem. The syntax or steps of the double loop problem solving model has been formulated in various ways by several learning experts. According to Shoimin (2013), double loop problem solving steps include:

a. Identifying a problem is not just a symptom.
b. Detect the immediate cause and rapidly implement a temporary solution.
c. Evaluating the success of interim solutions.
d. Deciding whether a root cause analysis is necessary or not.
e. If necessary, a higher level cause of the problem is detected.
f. Designing a root cause solution.

- *Media Powerpoint*

According to Daskolia, et al (2012: 271) states in the EE literature, creative thinking is implicitly considered to be either an essential quality of thinking and learning about the environment and current environmental issues, and coping effectively with them, or a prerequisite for visioning and designing alternative sustainable futures. Its relevance as a particular genre of thought processes, as an ability or as a state of mind that must be applied by people confronted with present and future complex, uncertain and con- flicting socio-environmental realities has been emphasized by some prominent scholars (Disinger & Howe, 1992; Bowers, 1995; Simmons, 2000; Chawla, 2002; Wals, 2010) and organizations in the field (North American Association for Environmental Education [NAAEE], 2002).

Microsoft powerpoint is one of the flagship products of Microsoft Corporation in the presentation application program that is most widely used today. This is because there are many advantages in it with the convenience provided. With Microsoft PowerPoint, we can design and make presentations that are more attractive and professional. The use of this presentation media can be used by educators and students to present learning materials or assignments to be given. According to TIM EMS (2012: 1), PowerPoint is one of the applications included in the Microsoft Office bundle, whose main function is widely used in presentations. Meanwhile Munadi (2008:

According to Umbaran (2013:3), several things that make PowerPoint attractive to be used as a presentation tool are the various text processing capabilities, colors, images, and animations that can be processed independently according to the creativity of the user. In principle, this PowerPoint consists of several elements of appearance and operational controls. The elements in question are slides, text, images, and color fields combined with the available backgrounds. These visual elements can be made motionless or made with certain movements as desired.

- *Critical Thinking Skills*

Ennis (2011:1) explains that critical thinking is reasonable and reflective thinking focused on deciding what to believe or do. This Ethnic opinion can be interpreted that critical thinking is thinking that has reason and reflective thinking that focuses on deciding what to believe or do. Desmita (2011:153) explains that critical thinking means reflecting on problems deeply and keeping the mind open to various approaches and different perspectives, not simply trusting information that comes from various sources (oral and written), and thinking reflective rather than just accepting ideas from outside without any significant understanding and evaluation. Santrock (2006: 316) defines that critical thinking is to interpret problems more deeply,

According to Surya (2013:45) critical thinking is thinking to: (1) compare and contrast various ideas, (2) refine and refine, (3) ask and verify, (4) filter, select and support ideas, (5) make decisions and scales, (6) provide a basis for an action. From some of the expert opinions above, the researcher concluded that critical thinking is a skill that a person has in understanding a problem or question, analyzing with considerations and being able to make conclusions with reliable and logical reasons. Critical thinking means thinking about problems deeply and being open to the views of others.

Critical thinking component consists of standards that must exist in critical thinking and its elements. According to Bassham (2002) critical thinking components include aspects of clarity, accuracy, thoroughness, relevance, consistency, logical truth, completeness and fairness. Meanwhile, according to Paul and Elder (2002), apart from the aspects that have been put forward by Bassham, it is necessary to add the breadth and depth of critical thinking such as interpretation, analysis, evaluation, inference, explanation and self regulation (APPA, 1990).

In critical thinking, there are certain factors that influence it. According to Fisher (2009:11) explains that in terms of critical thinking, it is clear that someone who can have the relevant skills but may ignore or choose to use

them in the right situations; for example, they may show they possess the skill by asking questions that have proper credibility in examinations, but they may not show it in their other jobs or in everyday situations. Based on Fisher's opinion, it can be understood that a person can have critical thinking skills but not everyone can use it well. This means, A person's critical thinking skills can develop or not depends on the person's willingness to develop them. It can be concluded that internal factors from within have an important role in developing critical thinking skills. Desmita (2011:155) that one important aspect of the development of critical thinking is determined by the active interaction of children with the environment. Children are active learners, forming their own hypotheses and then proving them through social interaction, physical manipulation, and their own thought processes, such as observing what is happening, reflecting on findings, asking questions and formulating answers.

- *Learning Results*

Dimyati and Mudjiono (2006) state that learning result are the result of an interaction of learning and teaching actions. From the teacher's side, the act of teaching ends with the process of evaluating learning result. From the student side, learning results are the end of teaching from the top of the learning process.Sudjana (2011) learning results are a result of the learning process using measurement tools, namely in the form of a planned test, both written tests, oral tests and action tests. Susanto (2013) suggests learning result, namely the changes that occur in students, both concerning cognitive, affective and psychomotor aspects as a result of learning activities. The notion of learning result as described above is emphasized again by Nawawi (in Susanto, 2013) which states that learning result can be interpreted as the level of student success in learning subject matter at school which is stated in the scores obtained from the test results to recognize a number of certain subject matter.

According to Hamalik (2013) learning result appear as changes in student behavior that can be observed and measured in the form of changes in knowledge, attitudes and skills. These changes can be interpreted as improvements and better development than before, for example from not knowing to being know, disrespectful attitude becomes polite and so on. Student learning results can be seen if the learning objectives that have been set can be achieved by students. Conversely, if most students cannot achieve the goals of learning, it means that learning result are not achieved.

- *Social Sciences*

Social science according to Trianto (2011) is an integration of various branches of social sciences, such as sociology, history, geography, economics, politics, law, and culture. Social science is formulated on the basis of social realities and phenomena which embody an interdisciplinary approach from the aspects and branches of social science. Social science also discusses between humans and their environment. The community environment where students grow and develop are part of the community who are faced with various problems that exist and occur in the surrounding environment. According to Sardjiyo (2009) social science is a field of study that studies, studies, analyzes social symptoms and problems in society by reviewing various aspects of life or a combination.

The existence of social science as a subject is built into various concepts, facts, generalizations and theories of social sciences. Because the essence of social science is pure science, while Social Science is applied science, so the task of social science is to utilize and simplify this material into learning materials in schools (according to Waspodo and Suhanadji, 2005) . More specifically, social science education in schools is aimed at being able to answer the current real life conditions of academic science, which serves to help students to know, understand and be able to apply what they know and how to participate and fill the future.

The purpose of social science learning is basically to educate and provide basic abilities for students to develop themselves according to their talents, interests, abilities from their environment and various provisions for students to continue to higher education levels (Solihatin &Raharjo, 2007). Meanwhile, according to Trianto (2011) the main objective of Social Sciences is to develop the potential of students to be sensitive to social problems that occur in society, to have a positive mental attitude towards correcting all imbalances that occur, and be skilled in overcoming any problems that occur everyday either befall himself and society.

One of the things that distinguishes social science from other subjects is that social science education is a reflection of natural changes that occur around one's life and is able to take new integrated approaches in solving important humanitarian problems: (1) problems of poverty, crime, low educational participation, juvenile delinquency, unemployment, urbanization, population problems, job opportunities and so on, which of course require an integrated approach (integration) of various disciplines and world views on these problems, (2) Technological advances provide various facilities for accessing data, as well as providing opportunities for students to be able to share in various meetings and scientific discoveries regularly across intellectual and geographic boundaries.

Based on the above opinion, it can be concluded that social science learning in elementary schools is basically intended to be able to solve problems related to life as a whole to the social problems that exist around it and as a result of geographical, economic, social and cultural influences.

III. RESEARCH METHOD

This research uses an experimental quantitative approach. Experimental quantitative research is a research method used to find the effect of a treatment or manipulation on other variables under conditions controlled by the researcher (Sugiyono, 2012). This study aims to examine

specific populations or samples, random sampling, data collection using research instruments, quantitative and statistical data analysis with the aim of testing a predetermined hypothesis. This type of research is a quasi-experimental with a nonequivalent control group design pattern.This study uses a quantitative approach with experimental methods. This study aims to determine the effect of the double loop problem solving learning model on critical thinking skills and learning outcomes in elementary schools. The method used in this research is the experimental method.

Table 1. Nonequivalent Control Group Design

Class	***Pretest***	***Treatment***	***Posttest***
Experiment	O1	X	O2
Control	O3	C	O4

Information:
O1 : Initial test in the experimental group
O2 : The final test in the experimental group
X : Double loop problem solving learning modelassisted by powerpoint media
C : Conventional learning model
O3 : Initial test in the control group
O4 : The final test in the control group

Subject this research is class IVA students of SD Muhammadiyah 16 Surabaya with 26 students as the experimental group and students of class IVB SD Muhammadiyah 16 Surabaya with 26 students as the control group. Data collection in research using tests. Giving tests to obtain data on critical thinking skills and learning outcomes, critical thinking skills tests in the form of a written test of descriptions which are given in two stages, namely the pretest and posttest, while the learning outcome test is in the form of multiple choice questions.

Prior to data analysis, the researcher conducted a validity test and a reliability test which aimed to determine the feasibility of an instrument. The data collected from the results of the distribution of the instruments were then analyzed using the normality test and the homogeneity test. After that, the hypothesis is tested.

IV. RESULTS

Before being used for research, the instruments used were validated first by an expert validator. The results of validation by the validator are presented below.

Table 2. Results of the Validation of Research Instruments by Expert Validators

No.	**Validated instrument**	**Score**			**Predicate**
		V1	**V2**	**Average**	
1.	Learning syllabus	3.58	3.25	3.41	valid
2.	Lesson plan	3.63	3.63	3.63	Very valid
3.	Student teaching materials	3.82	3.63	3.72	Very valid
4.	Student worksheet	3.83	3.33	3.58	Very valid
5.	Critical Thinking Skills Test	3.63	3.62	3.63	Very valid
6.	Learning Outcomes Test	3.63	3.62	3.63	Very valid
7.	Learning Media	3.71	3.58	3.63	Very valid

Source: Data processed by the author, 2020

Researchers tested the feasibility of the research instrument before analyzing the research data. At this stage, 5 indicators of critical thinking skills are declared valid if rcount is greater than rtable. The total number of students N = 26 with a significance level of 5% is 0.388. From the data analysis using SPSS, it was found that all aspects of critical thinking skills were declared valid.

Table 3. Results of the Validity Test for Critical Thinking Skills

Aspect	**r Count**	**r Table**	**Information**
Indicator 1	0.745	0.388	Valid
Indicator 2	0.514	0.388	Valid
Indicator 3	0.643	0.388	Valid
Indicator 4	0.590	0.388	Valid
Indicator 5	0.617	0.388	Valid

Source: Data processed by the author, 2020

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Furthermore, the researcher conducted a validity test on the learning outcomes test provided the conditions were stated valid if rcount is greater than rtable. The total number of students N = 26 with a significance level of 5% is 0.388. From the data analysis using SPSS, it was found that all items of the test items were declared valid.

Table 4. Results of the Validity Test of Learning Outcomes

Aspect	r Count	r Table	Information
No. 1	0.740	0.388	Valid
No. 2	0.655	0.388	Valid
No. 3	0.611	0.388	Valid
No. 4	0.551	0.388	Valid
No. 5	0.824	0.388	Valid
No. 6	0.575	0.388	Valid
No. 7	0.530	0.388	Valid
No. 8	0.574	0.388	Valid
No. 9	0.513	0.388	Valid
No. 10	0.544	0.388	Valid

Source: Data processed by the author, 2020

After the research instrument validity test was carried out, the next step was the researcher doing the reliability test. This is to find out whether the test instrument is reliable or not. Reliability testing in research instruments that have been trusted and reliable will produce reliable data too. In this study, the reliability test was conducted to test the students' critical thinking skills instrument using alpha cronbach's through the SPSS data processing program, while the learning outcome test instrument used the Spearman-brown formula. The results of the reliability of critical thinking skills are as follows.

Table 5. Reliability Test Results of Critical Thinking Skills

Cronbach's Alpha	N of Items
, 848	5

Source: SPSS output

Based on the table above, the results obtained from the reliability test of the student's critical thinking skills instrument showed a reliability of 0.848. Based on the reliability coefficient clarification table (Ruseffendi in Sundayana, 2015:12), it is known that the reliability test results of the student's creative thinking assessment sheet instrument have a high reliability level with the criteria of $0.60 \leq 0.848 \leq 0.80$) so that this instrument can be used in research. Furthermore, the researcher conducted a reliability test on the learning outcome test variables shown in the table below.

Table 6. Learning Outcomes Reliability Test Results

Cronbach's Alpha	Part 1	Value	, 799
		N of Items	5a
	Part 2	Value	, 604
		N of Items	5b
	Total N of Items		10
Correlation Between Forms			, 589
Spearman-Brown Coefficient	Equal Length		, 741
	Unequal Length		, 741
Guttman Split-Half Coefficient			, 738
a. The items are: ItemNo1, ItemNo2, ItemNo3, ItemNo4, ItemNo5.			
b. The items are: ItemNo6, ItemNo7, ItemNo8, ItemNo9, ItemNo10.			

Source: SPSS output

Based on the table above, the results obtained from the instrument reliability test of student learning outcomes showed a reliability of 0.741. Based on the clarification table of the reliability coefficient (Ruseffendi in Sundayana, 2015: 12) it is known that the results of the instrument reliability test of student learning outcomes have a high reliability level with the criteria of $0.60 \leq 0.741 \leq 0.80$) so that the learning outcome test instrument can be used in the study.

In accordance with the formulation of the problem and hypothesis in this study, the data processed in this study came from the critical thinking skills test data and student learning outcomes. Data on critical thinking skills and student learning outcomes in the experimental and control classes consisted of pretest and posttest data.

Table 7. Descriptive Statistics of Pretest and Posttest Data on Critical Thinking Skills Source: Data processed by the author, 2020

No.	Description	The Value of Students' Critical Thinking Skills			
		Experiment Class		Control Class	
		Pretest	*Posttest*	*Pretest*	*Posttest*
1	Average	68.2	84.5	68	76.2
2	N-GAIN	0.56		0.28	
2	Lowest Value	52	72	52	64
3	The highest score	84	100	84	88
4	Standard Deviation	10,086	11,115	9,732	10,086

Based on table 7 above, the average value of critical thinking skills at the pretest is 68.2, while the average value of posttest critical thinking skills is 84.5. In the experimental class, the n-gain value is 0.56 in the medium category. In the control class the average value of critical thinking skills at the pretest was 68, while the average value of posttest critical thinking skills was 76.2. In the control class, the n-gain value is 0.28 in the low category.

Table 8. Descriptive Statistics of Pretest and Posttest Data on Learning Outcomes

No.	Description	Value of Student Learning Outcomes			
		Experiment Class		Control Class	
		Pretest	*Posttest*	*Pretest*	*Posttest*
1	Average	69.4	83.5	68.1	75.6
2	N-GAIN	0.52		0.25	
2	Lowest Value	55	65	55	65
3	The highest score	85	100	85	90
4	Standard Deviation	9,201	11,115	10,303	9,201

Source: Data processed by the author, 2020

Based on the table above, the value of student learning outcomes before being given treatment double loop problem solving model assisted by powerpoint media has an average value of 69.4. After getting treateddouble loop problem solving model assisted by powerpoint media the average value of student learning outcomes is 83.5. In the control class using conventional learning models that are usually carried out by teachers, the average pretest score is 68.1 and the posttest average score is 75.6.

The normality test is used to test whether the data is normally distributed or not. The normality test used the kolmogorof-smirnov formula with a significance level of 0.05 or 5%, using SPSS.

Table 9. Results of Normality Test

Group	Group	Value of Significance	Level	Information
Critical thinking (Pretest)	Experiment	0.716	0.05	Normal
Critical thinking (Posttest)		0.646	0.05	Normal
Critical thinking (Pretest)	Control	0.949	0.05	Normal
Critical thinking (Posttest)		0.789	0.05	Normal
Learning outcomes (Pretest)	Experiment	0.873	0.05	Normal
Learning outcomes (Posttest)		0.646	0.05	Normal
Learning outcomes (Pretest)	Control	0.741	0.05	Normal
Learning outcomes (Posttest)		0.873	0.05	Normal

Source: Data processed by the author, 2020

Test for normality using the kolmogorof-smirnov formula with a significance level of 5%, namely 0.05. If the significance value <0.05, the conclusion is that the data are not normally distributed. However, if the significance value> 0.05, the data is normally distributed. Based on table 9 above, all variables have a value of more than 0.05, so it can be stated that all research variables have a normal distribution.

This homogeneity test is carried out to test the similarity of several different samples. The homogeneity test of the data was calculated using the Levena test using SPSS with the criteria if the probability (P> 0.05) then the sample was homogeneous, whereas if the probalittas (P <0.05) then the sample was not homogeneous.

Table 10. Homogeneity Test Results

Variable	Group	Score Significance	Level	Information
Critical thinking (pretest)	Experiment	0.747	0.05	Homogeneous
	Control			
Critical thinking (posttest)	Experiment	0.846	0.05	Homogeneous
	Control			
Learning outcomes (pretest)	Experiment	0.481	0.05	Homogeneous
	Control			
Learning outcomes (posttest)	Experiment	0.159	0.05	Homogeneous
	Control			

Source: Data processed by the author, 2020

Table 10 is the homogeneity test data using the 5% significance level, namely 0.05. The conclusion is, if the significance value <0.05, the variant of the data group is not homogeneous, and if the significance value is> 0.05, the variant of the data group is homogeneous. Based on the table above, all variables have homogeneous data variants.

Hypothesis testing is used to answer the problem formulations and hypotheses proposed in this study. Hypothesis testing used in this study is to use the t test.The t test is needed to partially test the significance level between each independent variable's influence on the dependent variable.

Table 11. Hypothesis testing

Variable	T	Df	Sig. (2-tailed)	Description
Critical thinking	7,439	50	0,000	H1 accepted
Learning outcomes	6,472	50	0.002	H2 accepted

Source: data processed by the author, 2020

The results of the t-test analysis on the critical thinking skills variable obtained the t-count value of 7.439. Based on (df.50), the t-table value is 1.676.Based on the table above, the critical thinking skills variable has a t-count value of 7,439 (7,439>1,676) and the result of sig. 2 tailed worth 0.000<0.05, meaning that H1 is accepted because the value of t is greater than t table and valuesig. 2 tailed less than 0.05. Thus, it can be stated that there is influence double loop problem solving learning model assisted by powerpoint media on critical thinking skills of fourth grade elementary school students. In this respect, there is a difference Students' critical thinking skills between the control class and the experimental class at the time of learning.

The results of the analysis with the t-test on the learning outcomes variable obtained a t-count value of 6.472. Based on (df.50), the t-table value is 1.676.Based on the table above, the learning outcome variable has a t-count value of 6.472 (6.472>1,676) and the result of sig. 2 tailed equal to 0.002<0.05, meaning that H2 is accepted because the value of t is greater than t table and valuesig. 2 tailed less than 0.05. Thus, it can be stated that there is influence double loop problem solving learning model assisted by powerpoint media on learning outcomes of fourth grade elementary school students. In this regard, there are significant differences on learning outcomes between the control class and the experimental class at the time of learning.

V. DISCUSSION

- *The Effect of Learning Model Double Loop Problem Solving Using Powerpoint Media on Critical Thinking Skills of Class Four Elementary School Students*

In the analysis of the results of hypothesis testing (t test) on critical thinking skills, the t-count value is 7,439 (7,439> 1,676) and the result of sig. 2 tailed worth 0,000 (0,000 <0.05), based on these data it can be concluded that there is an effect of the double loop problem solving learning model assisted by powerpoint media (X) on students' critical thinking skills (Y1). The double loop problem solving learning model assisted by powerpoint media is more effectively used in learning, this is in accordance withGulo (2002: 111) states that problem solving is a method that teaches problem solving by emphasizing the solving of a problem in a logical manner.The benefit of raising a problem at the beginning of learning can trigger student thinking so that students will try to solve it scientifically. Djamarah (2006: 103) states that the problem solving learning model (problem-solving method) is not just a teaching method but also a method of thinking, because in problem solving you can use other methods starting from looking for data to drawing conclusions.

Critical thinking can be achieved more easily if a person has the dispositions and abilities that can be considered as the characteristics and characteristics of critical thinkers. The opinion of Larsson (2017) states that critical thinking can be interpreted as someone's attempt to check the truth of information using evidence, logic and awareness of bias. Another opinion was put forward by Sudiarta (2009) that the ability to think critically has been proven to prepare students to think in various disciplines because the ability to think critically is a cognitive activity carried out by students by dividing how to think in real activities by focusing on making decisions about what one believes or does. The ideal critical thinker is open minded;(Beistle, Smith, & Nagel, 2006).

Critical thinking is a disciplined intellectual process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and / or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide for beliefs and actions. In exemplary form, it is based on universal intellectual values that transcend the division of subject matter: clarity, accuracy, precision, consistency, relevance, sound proof, good reason, depth, breadth, and fairness.

The process to improve critical thinking skills is developed from a problem. The first step is elementary clarification, which is identifying problems through questions, analyzing, and clarifying the problems at hand. The second step is the basis for the decision by considering and observing or observing the truth of a problem. The third step is Inference by educating, inducing, and determining the next step contained in the fourth step, namely Advanced clarification of the assumptions that point to a truth by means of Supposition and integration of all assumptions, data, thoughts to get the correct conclusions, the fifth step is Strategies and tactics, namely through determining an action.(Sumarna & Herman, 2016).

This critical thinking ability is very important for students to have because it includes a process of mental activity in receiving, processing, analyzing, synthesizing, and evaluating the information obtained to make decisions or actions in solving problems. The problems that will be faced by students are not only in lessons, but in everyday life there are also many problems that will be faced by students. So that students are required to have the ability to think critically so that they can make the right decisions or actions in solving any problems faced.

A student who has critical thinking skills is expected to have reasoning that makes sense in understanding and is able to make decisions in complex choices and be able to analyze the interconnection between systems. These students also have the ability to solve the problems they face independently by compiling, disclosing, analyzing, and seeking to solve problems. It is reinforced by Muijs and Reynolds (2008: 185) that recently there has been an emphasis on the importance of learning that develops thinking skills due to various changes in society, especially changes in knowledge and information becoming increasingly complex and booming, which means that learning processes a large amount of knowledge is not enough.

Someone who has the ability to think critically is able to relate things more accurately. He is accustomed to using his critical thinking skills to research beforehand, making connections with the various incoming information so that they are not easily affected. The ability to think critically in everyday life can prevent a person from negative influences and help in the process of self-actualization in social life, education and work. Of course, the level of critical thinking skills in each person is different, it can be seen as a continuum that extends from the lowest level to the high level (Paul & Elder, 2001).

- *The Effect of the Learning Model of Double Loop Problem Solving with Powerpoint Media on Learning Outcomes of Class Four Elementary School Students*

In the analysis of the results of hypothesis testing (t test) student learning outcomes obtained tcount of 6.472 (6.472> 1.676) and sig. 2 tailed worth 0.002 (0.002 <0.05). From these results it can be concluded that there is an effect of the double loop problem solving learning model assisted by powerpoint media (X) on learning outcomes (Y2). This is in accordance with Mas'ad et al (2016) which states that the double loop problem solving learning model can improve learning outcomes for elementary school students.

Based on some of the problems that have been described in the background, a suitable learning model is needed where students not only actively participate in learning activities but also provide opportunities for students to develop thinking skills so as to provide an increase in student learning outcomes. The researcher offers an alternative learning solution, namely by applying the double loop problem solving learning model. double loop problem solving learning model is a variation of learning with problem solving with an emphasis on finding the main causal (cause) of the problem. The double loop problem solving learning model is widely used to support a learning approach that invites students to be active in teaching and learning activities. The double loop problem solving model focuses on solving complex and unstructured problems. In this learning model, students need to be encouraged to work on two different, but interrelated, solving loops. In the end, learning with this model is expected to leave a deep impression in the minds of students and make it a meaningful learning experience for their lives in the future so that it has an impact on improving student learning outcomes.

Freeman & Knight (2011) added that the double loop problem solving model can improve the cognitive learning outcomes of students. Students not only acquire concepts through textual knowledge but also activities carried out in learning.This opinion shows that student learning outcomes have increased by using problem-based learning models. In the learning process, learning outcomes are important to determine the achievement of predetermined competencies. This is in line with the opinion of Jihad and Haris (2012: 15) that learning outcomes are a real change in student behavior after a teaching and learning process is carried out in accordance with the learning objectives. So, it is hoped that students will be able to achieve the learning objectives and competencies that have been determined in a teaching and learning process in order to achieve the main objectives of an education as stated in Law no. 20 of 2003 concerning the National Education System, which aims to develop the potential of students to become human beings who believe and have devotion to God Almighty,

The use of learning models can be combined using learning media as an intermediary in delivering learning material. According to Criticos in Daryanto (2016: 4) states that the media is one of the communication components, namely as a messenger from communicators to communicants used as tools and materials in learning activities. Another opinion was expressed by Hamdani (2011: 243) that media is a learning component that contains instructional material in the student environment, which can stimulate students to learn. The media used by researchers in this study was powerpoint media. Powerpoint media includes computer-based media. The powerpoint media here plays a role in helping the process of implementing the double loop problem solving learning model. The material contained in the powerpoint media is the types of work. With this media, it is hoped that students can better understand the material and make the learning atmosphere more interesting.

Raelin (2006) adds that the learning outcomes of students can increase after learning by providing experiences to students. One of the activities that can be done is the discussion method. Scott (2008) states that the discussion method can help students who initially only receive knowledge to participate actively, besides being able to train cooperation and communication attitudes.This is in line with the results of research by Dostal (2015) which states that when students can find coherence between what

is known and what is not known then connect them so that in the end they find a point of view that can solve the problem. Another reason put forward by Yulianti et al (2018: 92) that the value of student learning outcomes in the experimental class is better is the existence of good cooperation by group members. All group members have responsibilities, opinions, solutions and insights conveyed by each group member.

The same thing was echoed by Ibrahim and Nur (2000: 19) regarding Vygotsky's learning theory that believes that social interaction with friends spurs the formation of new ideas and enriches students' intellectual development. Relationship with the double problem solving loop model in terms of linking new information with cognitive structures that are already owned by students through learning activities in social interactions with other friends.

Problems can encourage seriousness, inquiry, and think in a meaningful and very strong (powerful) way. Education requires new perspectives in finding various problems and ways of looking at problems. Various breakthroughs in science and technology are the result of interest in the problem. In general, education begins with an interest in problems, continues with problem determination, and uses various dimensions of thinking.In solving problems that exist in the real world, we need to realize that all cognitive processes and mental activities are involved. The brain works with certain cycles and literacy from systematic, systemic, general analysis and divergent thinking (Rusman, 2014: 213). The 21st century is marked by high connectivity due to inseparable realities. Issues that exist in the real world are cross-disciplined and involve interrelated perspectives. We need a broad view of things and a mix of different interrelated basic knowledge.

The results of the above research indicate that student learning outcomes have increased by using problem-based learning models. In the learning process, learning outcomes are important to determine the achievement of predetermined competencies. This is in line with the opinion of Jihad and Haris (2012: 15) that learning outcomes are a real change in student behavior after a teaching and learning process is carried out in accordance with the learning objectives. So, it is hoped that students will be able to achieve the learning objectives and competencies that have been determined in a teaching and learning process in order to achieve the main objectives of an education as stated in Law no.

The findings in this study are in line with research by Fatmala (2016) which states that students who are treated with a double problem solving loop model are significantly better than students treated with conventional learning models. This is supported by Mas'ad's (2016) research that the double loop problem solving method can improve social studies learning outcomes**.** The cause of differences in student learning outcomes who apply the double problem solving loop model with the conventional learning model is because in the experimental class students not only form information from a subject matter that they know beforehand, but are also accustomed to building systematic relationships between pieces of information by identifying important elements and determine the structure formed during the learning process. Whereas in the control class, students only understand the information described by the teacher.

VI. CONCLUSIONS AND SUGGESTIONS

➢ *Conclusion*

There is a difference in critical thinking skills in the fourth grade of Muhammadiyah 16 Surabaya elementary school between the implementation of the double loop problem solving learning model assisted by powerpoint media and the lecture learning model in social studies with the theme of types of work. The results of this study were evidenced by the difference in the average score of critical thinking skills between the experimental class and the control class, which was 8.3, in which the experimental class was superior in critical thinking skills. In addition, the data analysis also proved that the value of tcount 7.439>ttable 1.676 (df 50) and the value of Sig. (2-tailed) 0.000 <0.05, which means that Ho is rejected and Ha is accepted.

There are differences in the learning outcomes of fourth grade students of Muhammadiyah 16 Surabaya elementary school between the implementation of the double loop problem solving learning model assisted by powerpoint media and the lecture learning model in social studies with the theme of types of work. The results of this study were evidenced by the difference in the average score for critical thinking skills in the experimental class and the control class, which was 7.9 in which the experimental class was superior in learning outcomes. In addition, the data analysis also proved that the t-count value was 6.472> t-table 1.676 (df 50) and the value of Sig. (2-tailed) 0.002 <0.05, which means that Ho is rejected and Ha is accepted.

➢ *Suggestion*

Based on the research conclusion which states that the application of the double loop problem solving learning model assisted by powerpoint media affects critical thinking skills and learning outcomes, some suggestions can be made to:

1. Teachers / educators. Teachers are expected to be able to explore the use of the double loop problem solving learning model assisted by PowerPoint media effectively, such as by combining various active methods in it, as well as involving other media that are relevant and in accordance with the conditions of the material, students, and the environment, so as to encourage critical thinking skills and results. student learning. The strengths and weaknesses of this research are expected to be a reference material for teachers in applying the double loop problem solving model assisted by powerpoint media in the learning activities that will be carried out.
2. For student. It is hoped that from the results of the research students will be more active in learning, with various types of activities, especially activities in collaboration in study groups, identifying problems,

solving problems, and communicating problem solving, so that students are more active in learning and gain experience and knowledge as provisions for facing school exams and real life.

3. For Schools. The school is expected to examine the results of this research carefully so that they can become input and reference to improve the quality of learning in each class and subject through the application of interactive models and media such as the double loop problem solving learning model assisted by PowerPoint media, so as to improve the main goals of education.
4. Other researchers. Other researchers are expected to maintain the strengths of this study, and fix or find solutions to the shortcomings of this study, so that better research results are obtained regarding the use of double loop problem solving learning models assisted by PowerPoint media and about factors that affect critical thinking skills of learning outcomes students.

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