

## Improvement of Critical Thinking Skills and Social Skills through Model Discovery Learning on Snake Media Appliances

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**Abstract:** The purpose of this study is to determine the effect of discovery learning model with snake ladder media on the ability of critical thinking and social skills of students. This type of research includes quasi experiment, with non-equivalent design (pretest and post-test) control group design. Technique of data analysis in this research by using test independent t test. The result of the research shows that there is significant difference of critical thinking ability between control and experimental class in other words there is influence of application of discovery learning model with snake ladder media to critical thinking ability in learning process with  $t_{\text{count}} = -5,603$  and there is a significant difference of student's social skill between control and experiment class in other words the influence of learning discovery learning model with snake ladder media on student social skill in learning process with  $t_{\text{count}} = -15,200$ . It can be concluded that the discovery learning model with the snake ladder media significantly influences the critical thinking and social skills of the students.

## INTRODUCTION

Education functions to develop the ability and form the character and civilization of a dignified nation. Education should be able to provide services to individual personal development throughout life. Education is a continuous and continuous process because human development never stops throughout human life itself. An educated human will always evolve in a better direction. But the main problem in education is in the learning process. This is evident from the average learning outcomes of students who are always still very apprehensive. This is because the learning process takes

place conventionally and does not touch the learner dimension of the learners themselves that is how the meaning of learning<sup>[1]</sup>.

Master has a very important role in this. Teachers are one of the determinants of the achievement of educational goals. The main task of a teacher is to educate learners. Teachers are required to be able to choose and apply models and quality learning media in order to improve the quality of learning. The role of models and learning media makes it easier for learners to understand the subject matter more quickly.

Implementation of learning model is basically aimed to create learning conditions that can make learners play

an active role, so that, learning can take place is not monotonous and fun. Likewise with learning media that have positive strength and synergy that can change attitudes and behavior of learners toward creative and dynamic changes. Media is no longer just a tool in the learning process but the media has become an important part in the system of education and learning.

During this time not many teachers have not been able to apply the media and use the learning media appropriately. Schools do not provide training to teachers about the importance of applying relevant learning models and media. This is also what makes learning, so, boring and learners do not understand the material being taught. Lack of enthusiasm, learners make their ability in critical thinking is still low. Learners rarely perform tasks in groups, so that, their social skills are also low.

Discovery learning model is one of the appropriate models in curriculum 2013, this model provides an opportunity to learners to find their own a concept in learning. Through the model of discovery learning it can grow the attitude of independent, critical and creative learners. They are not only consumers but are expected to play an active role as the principal and creator of science. The study of the model of the present invention is part of the scientific approach framework. Discovery learning model applied through snake ladder media will support the creation of active learning and fun for learners. Proper and varied media use can overcome the passive attitude of learners. In addition, the discovery learning model is implemented in groups, so that, student's social skills can be improved through group activities because learners are allowed to work together with groups to solve problems in an investigation they undertake<sup>[2]</sup>.

Discovery learning model and snake ladder media are very effective in helping teachers deliver learning materials. Discovery learning model is one of the learning models relevant to the Curriculum 2013 while for the ladder snake it self can increase student's activeness in the class in critical thinking. So, the use of media and this model is expected to improve the ability of critical thinking and social skills of students in grade 4 elementary school students.

The formulation of the problem in this research are: is there any positive influence of the application of discovery learning model with snake ladder media to critical thinking ability to grade 4 students of elementary school? is there a positive influence of the application of discovery learning model with snake ladder media to social skills in grade 4 students of elementary school? The specific purpose of this research is to know the influence of the application of discovery learning model with snake media of the ladder to the critical thinking and social dilemma of student In general the result of this research suggests that there are innovative methods and learning media to be applied in the classroom during the learning process.

### **Conceptual framework**

**Discovery learning model:** This model directs students to be able to find something through the learning process that is done. Students are trained to become accustomed to being a scientist. They are not only consumers but they are also expected to play an active role, even as principals of the creator of science.

The discovery learning model is an important component in a constructivist approach that has had long history in education. The idea of learning Discovery Learning arises from the desire to give pleasure to children or students in "discovering" something by themselves, following in the footsteps of scientists. According to Hamiyah<sup>[4]</sup> states that the model of discovery learning is a learning model that regulates teaching, so that, children acquire previously unknown knowledge.

Amin etc. in his research, stated that the model of discovery learning can improve the understanding of the concept of material to students. In addition, Herdian (2010) conducted a study with focus on the application of discovery learning in improving student learning outcomes on social subjects. The results of this study using qualitative pending concluded that the application of discovery learning model in addition, to improving learning outcomes can also increase student activity optimally in finding and discovering the core of learning materials learned. Methods employing discovery learning involves acquisition of the target content, a definition of discovery learning is needed. However, there is a myriad of discovery-based learning approaches presented within the literature without a precise definition.

There are three main features of learning discovery learning, namely exploring and solving problems to create, integrate and generalize knowledge; student-centered; activities to combine new knowledge and existing knowledge.

**Snake ladder media:** The snakes and ladder's metaphor, one can argue that the game should be motivated, know the game rules (how to play), interact with the other players (whom to play with), try to win having clear goals, develop strategies to win (where the piece should be moved to reach the winning square) and have the skill to enact them at the right time<sup>[4]</sup>.

Snake game ladder is one type of game that is often played by children. Games played by two or more people can train children to compete. In addition, through the game of snakes ladders can train children to work together and train children to act sportsmanship<sup>[5]</sup>.

This medium is tailored to the characteristics of grade 4 elementary school students to absorb information with the help of images on each question and rely on their visual ability to obtain information. Images in this medium to attract student's attention and to improve

student's motivation in learning. Snake game ladder done students in groups, this game is done after students do learning by using discovery learning model. How to do a snake ladder games are?

- Students form groups of 5 people per group (fixed groups such as learning using the discovery learning model)
- Teacher explains the rules in the game
- The teacher asks the representatives of each group as pawns to go forward on the ladder
- Students or other groups will help the group's representatives to pass through obstacles to reach the finish
- First the teacher will ask all group representatives to be on the start box
- Previously they will take the lottery to throw the first dice

If the group at the dice throw gets 5 points then it has to advance as much as 5 plots. If the plot he was stalking with a question mark then he should take the card of the problem in accordance with the number of plots he was stalking for discussion with his one friend.

If they successfully answer the question correctly then he or she is entitled to be in that box if not able to answer correctly then the group must return or retreat 5 steps towards the previous plot. If at the time of throwing dice, he gets a plot with a staircase then the representative of the group that becomes the pawn will climb the ladder.

If at the time of throwing dice, he gets a plot with a snake picture then the representative of the group that becomes a pawn will descend on another plot connected by the snake. The group declared the winner is the group that can reach the finish line most quickly.

**Critical thinking:** Critical thinking is an activity that meets various intellectual standards such as clarity, relevance, adequacy, coherence that requires interpretation and evaluation of observations, communications and other sources of information<sup>[6]</sup>.

Listed for more information on how to learn and how to learn and how to learn and how to do it. Besides, more study should be given in teaching and learning environment that gives trust to the students to lead their own study. Such an environment will give room for an effective inculcation of HTS in the teaching and learning process<sup>[7]</sup>.

The primary benefit of a good conception of critical thinking and the critical thinker is that of providing concrete knowledge of what is to be accomplished in teaching critical thinking. By making salient significant features of critical thinking, it identifies considerations important for deciding questions about curriculum and

instruction. It seems appropriate to conclude this study by discussing some of the more important considerations.

Critical thinking can also be said as a reflective thinking skill to decide what the critical thinking skills of each student are doing is not the same, therefore, the critical thinking skills in the learning process need to be trained and developed by the teacher. One way can be developed in training the critical thinking ability of how students can search and find problems, analyze problems, create hypotheses collecting data, test hypothesis and determine alternative solutions<sup>[8]</sup>.

## MATERIALS AND METHODS

**Research design:** The research method used in this research is quantitative and data processing using statistical calculation. Type of research used is quasi experiment. Quasi experimental research is a study intended to determine the presence or absence of a result of "something" is raised on the subject of investigation. To conduct a pure experiment then the variables that may affect and influence the independent variables must be strictly controlled. Strict control is possible only in experiments in the laboratory. Given this research is not in laboratory conditions but in the learning process so it is not possible to control all independent variables and strictly bound, then this form of research is quasi experiment. The design type used in this research is non-equivalent (pretest and post-test) control group design.

In this design there is a control group that is not subjected to experiments but participates in getting observations. On O1 and O3 will be given the same pretest to test the initial capability of the experimental class and control class. After the treatment is complete in the experimental class, O2 will be given the posttest as well as the control class, after learning with the conventional model and the drawing media in the student book O4 will be given the same posttest to know the student's final ability.

This design is used to find the influence of discovery learning model with snake media ladder to students' critical thinking ability because in this design the experimental group and control group were chosen randomly and in this study the control group only as comparison.

**Data collection techniques and research instruments:** Techniques of collecting research data used are test and observation.

**Test:** The test instrument is used to collect data about student's critical thinking skills. The test used in the form of description with the number of questions as many as 10 questions. Application of discovery learning model requires students to be able to think high level, so, the

Table 1: Description of student skills observation sheet in learning of discovery learning model with snake ladder media

Indicators	Sub indicators
Corporation	Active in discussion activities
	Being able to work with group members
Communication	Giving opinion
	Answering teacher and friends questions
	Respecting others opinion
Participation	Listening actively and giving response
	Participating the learning activities well
	Participating in the success of the learning
	Completing the task just in time

question used is the cognitive domain at least at the level of analysis. The form of test given in the form of description, it is shown to measure student's critical thinking skills.

**Observation:** In this study used structured observations, namely observations that have been designed systematically, about what will be observed when and where the place. Description of observation instruments can be seen in Table 1.

## RESULTS AND DISCUSSION

**Results data description:** Description of data in this study gives an overview of the results of research that has been done. This study took a sample of 68 students grade IV SDN 2 Bambe, Driyorejo-Gresik who followed the learning on subtheme Natural Beauty of my country. The subjects of this study consisted of two classes, namely control class (IV-A) with 34 students and experimental class (IV-B) with 34 students. The experimental class is a class that uses discovery learning model with ladder snake media while the control class is a class using conventional learning model. Learning result data on subthemes Natural Beauty of My Country fourth grade students SDN 2 Bambe, Driyorejo-Gresik using conventional learning model and discovery learning model with snake ladder media.

The amount of pretest and post test value in both variables is critical thinking skill and social skill between control class and experiment class. Furthermore, from the overall value, it can be known the average value of pretest and posttest between control class and experiment class, by way of Sum up each value and divide it by the number of students, so that, it will be able to know the mean of the pretest and post test results of each class. The mean result of critical thinking ability and social skill of students for more details can be seen in Table 1 description of learning outcomes.

Based on Table 2 shows that the result of the ability of critical thinking and social skills of students by using discovery learning model with snake ladder media in grade IV-B students (experimental class) has average value of student's critical thinking ability in pretest group

Table 2: Learning outcomes description

Description	Critical thinking skill		Social skill	
	Pretest	Posttest	Pretest	Posttest
Control class	73.09	75.86	48.20	52.21
Experimental class	73.71	83.31	47.78	79.58

Table 3: First hypothesis test results

The variables of critical thinking skill	Mean
Post test of the control class critical thinking skill	75.865
Post test of the experimental class critical thinking skill	83.312
t-count	-5.603
Signature	0.000

of 73.71 and post test equal to 83.31 and average score of social skill result on pretest group = 47.78 and post test equal to 79.58 mean higher than student of class IV-A (control class) The result of student's critical thinking ability in the pretest group is 73.09 and the post test is 75.86 and the mean score of social skill result on the pretest group is 48.2 and the post test is 52.21. Comparison of improvement of critical thinking skill between experiment class and control class ( $9.6 > 2.77$ ) whereas comparison of social skill result between experiment class and control class ( $31.8 > 4.01$ ). The comparison was obtained from the result of difference of mean Between pre-test and post-test of each class.

### Hypothesis testing

**Hypothesis testing of critical thinking ability:** Data analysis technique used in this research is independent test t test. The following is the result of statistical analysis of independent t test using SPSS 20.0.

The result of the calculation in Table 3 shows that the average post test rate of critical thinking ability in the control class is 75.865 while the mean post test ability of critical thinking in the experimental class is 83.312. From the average value, it can be said that there is a difference of critical thinking ability of post test between control class and experiment class, reinforced by t test result that is  $t^{\text{count}} = -5.603$  with significant level (sig.)  $< 5\%$ . This proves that there is a significant difference of critical thinking ability between the control class group and the experiment in other words the application of discovery learning model with the snake ladder media to the critical thinking ability in the learning process of subtheme Natural beauty of the my country the fourth grade students in elementary school, so, the first hypothesis reads: "There is an effect of applying the discovery learning model to the landing snake media to critical thinking skills in grade 4 elementary school" has been proven.

**Hypothesis testing of social skills:** The following is the result of statistical analysis of independent t test using SPSS 20.0.

Table 4: Second hypothesis test results

The variables of learning achievement	Mean
Post test of the control class social skill	52.209
Post test of the experimental class social skill	79.582
t-count	-15.200
Signature	0.000

The result of calculation in Table 4 shows that the average score of post test students social skill in the control class is 52.209, meanwhile the post test average social skill student in the experimental class is 79.582. From the average score, it can be said that there is difference of social skill student from post test between control class and experiment class, reinforced by result of t test that is  $t_{count} = -15.200$  with significant level (sig.)  $<5\%$ . This proves that there is a significant difference between student's social skills between the control class and experimental group in other words the influence of the learning discovery learning model on the social skills of the students in the learning process in the fourth grade students in elementary school, so that, the second hypothesis reads: Discovery learning model with snake ladder media on social skills in grade 4 elementary school students "has been proven.

#### Discussion of learning implementation results by using model discovery learning and snake media ladder on the ability of critical thinking and student social skills:

Feasibility early motivation of learning is needed in order to prepare students to be able to receive material to be delivered related to learning materials. Motivation of students through challenging situations in this research is directing students to be able to find something through the learning process that is done. Through discovery activities students will learn to organize and deal with problems. They will try to find their own problem solving according to their capacity as learners.

The task of solving problems/questions given with critical thinking skills after conducting discovery activities, can establish students in learning ability to be more critical in responding to a problem. This is in line with the theory expressed by Fisher<sup>[6]</sup> "one can be said to think critically if it can test the experience, the value of knowledge and ideas and gain the arguments before it comes to judgment". Student experience and knowledge are tested using questions which contains the understanding of critical thinking.

Activities that students will be done to train students to be able to increase social skills because in the discovery activities required interaction between the communication groups and the ability to establish good relationships with others. This is in line with Arends<sup>[9]</sup> stating that, social skills are behaviors that support the success of social relationships and enable individuals to work effectively with others. Children can learn social skills from different individuals from parents, the environment and teachers.

The discovery learning model and the ladder snake media can help students engage in various activities of collecting information, comparing, categorizing, analyzing, integrating, reorganizing materials and making conclusions as a product of discoveries through this process students will acquire new knowledge. Using discovery learning models and snake ladder media can train students to become more critical in solving the problems they face in daily life in their social life through the social skills they acquire.

The average score of students 'critical thinking skills using discovery learning model with snake ladder media on critical thinking ability in grade IV-B students (experimental class) has average value of student's critical thinking ability in pre test group of 73.71 and Posttest of 83.31 and average score of social skill result on pretest group 47.78 and posttest equal to 79.58 mean higher than class student of A-class (control class) has average value of result The student's critical thinking ability in the pretest group was 73.09 and the post test was 75.86 and the average score of social skill result of the pretest group was 48.2 and the post test was 52.21. So, it can be concluded that the ability of critical thinking and social skills of students in the experimental class is higher than the control group. Discovery learning model and snake ladder media positively affect the ability of critical thinking and social skills of students.

The results of the implementation of this lesson is only to ensure that the learning implementation plan with the discovery learning model with snake ladder media that has been created can be done in accordance with the plan that has been prepared previously. Therefore, these results are only used as support only and not used in the withdrawal of conclusions.

#### Discussion on the application of discovery learning model with snake media ladder to critical thinking ability:

Based on the results of research observations proved that there is influence the application of discovery learning model with snake ladder media on the ability of student's critical thinking in the learning process. The average posttest of critical thinking ability in the control class is 75.865 while the mean posttest ability of critical thinking in the experimental class is 83.312. From the average value, it can be said that there is a difference of critical thinking ability of posttest between control class and experiment class, reinforced by t test result that is  $t_{count} = -5.603$  with significant level (sig.)  $<5\%$ . This proves that there is a significant difference of critical thinking ability between control class group and experiment in other words the application of discovery learning model with snake media ladder to critical thinking ability discovery learning is a learning based on the invention is expected to stimulate the thinking ability of learners because learners find their own knowledge to be able to

understand the facts. Through, the process of discovery allows learners to see in detail, analyze and evaluate more than information that is simply received. Critical thinking can also be linked as a reflective thinking skill to decide what the critical thinking skills of each learner are doing. This is in line with the opinion by Amri<sup>[8]</sup> which states that the ability to think of each learner is not the same, therefore, the ability to think critically in the learning process needs to be trained and developed by the teacher.

The results of this study are in accordance with a study conducted by Khairunnisa and Kadir<sup>[10]</sup> on “The effects of media-assisted guided discovery methods of concrete objects to mathematical critical Thinking ability” which found no significant effect of students' critical thinking skills in the application of guided discovery methods in mathematics.

A study by Sugiono on “The influence of the discovery learning model to increase student learning achievement and self-efficacy in social conflict material”, the findings of social skills research using discovery learning models are higher and significantly different from those in the classroom using conventional models. The average social skill of students in the experimental class 80.286 and the control class 66.000 as well as the student's self-efficacy averaged 3.45 experimental class and control class 3.20 from the manova test can be concluded that there is a significant effect of applying the discovery learning model to the achievement Learning and self-efficacy.

**Discussion on the implementation of discovery learning model by using snake media ladder on student social skills:** Observation result proved that there is influence of discovery learning model with snake ladder media toward social skill of fourth graders of elementary school. The hypothesis proved that there was a difference in the mean score of social skills in the control class group of 52.209 (Good) while the average score of social skill in the post test group was 79.582 (very good). The result of the calculation shows that the average score of posttest student social skill in the control class is 52.209, meanwhile the posttest average social skill student in the experimental class is 79.582. From the average score, it can be said that there is difference of social skill Student from post test between control class and experiment class, reinforced by result of t test that is  $t_{count} = -15,200$  with significant level (sig.)  $<5\%$ . This proves that there is a significant difference between student's social skills between the control class and experimental group in other words the influence of the learning discovery learning model on the student's social skills. The social skills that can be practiced by students in their daily lives are actually related to their intellectual skills or cognitive abilities. Therefore, it is often not

clearly distinguished between intellectual skills and social skills. The social skills that can be developed through the learning process is cooperation, communication and participation.

In conveying the results of the discussion on the results of the findings and conclusions in the discussion forums should be supported by the behavior and attitude of polite and skilled speak with using the correct grammar. While other students who submit feedback and provide suggestions should be supported with an attitude of respect for the opinions of others. Therefore, each discussion participant must be able to participate in sharing and accepting ideas with others.

The results of this study are in line with a study conducted by Nugrahani<sup>[11]</sup> on “Visual-based learning media shaped snake game ladder to improve the quality of teaching in primary schools” which found in his research in general visual-based media in the form of a snake The staircase is an effective medium for improving student's absorptive capacity and understanding of the lesson and student's interest in visual learning media in the form of snake ladder game is very good, it is seen from student enthusiasm. Furthermore, it can be concluded that  $H_1$  proved true and rejected  $H_0$ . Discovery learning model and snake ladder media have a positive effect on student's social skill.

## CONCLUSION

The result showed that the average of student's posttest critical thinking ability which was taught through discovery learning model with snake ladder media was 83.31 and the average result of social skill was 79.58. While the average result of critical thinking ability of post test of students who taught through conventional model is 75.86 and the mean result of social skill is 52.21. From different test independent t test, t test result that is  $t^{count} = -5.603$  with significant level (sig.)  $<5\%$ . This proves that there is a significant difference in critical thinking ability between control and experiment class. The result of t test is  $t_{count} = -15.200$  with significant level (sig.)  $<5\%$ . This proves that there are significant differences in student's social skills between control and experiment class. Then it can be concluded that there is influence of application of discovery learning model with snake ladder media to critical thinking ability and social skill of 4 elementary school students.

It is expected that educators in the learning process can apply the discovery learning model with the snake ladder media, so that, students are more active, make it easier for students to understand, remember the learning materials and improve the ability of critical thinking and social skills of students.

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