

## LEARNING RESULT DIFFERENCE MOODLE–BASED ANALYSED BY GROUP INVESTIGATION LEARNING MODEL IMPLEMENTATION AND CRITICAL THINKING ABILITY

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**Abstrak:** This research objective is to investigate the difference of learning result Moodle-based by group investigation learning model implementation and critical thinking ability. The type of this research is quantitative using treatment design by level 2x2. The data of this research was taken by observation result, test and questionnaire. The data analysis technique using two way annova test and t test to investigate the difference of learning result moodle-based after treatment. The result shows that (1)The learning result of moodle-based using group investigation learning model is better than using convntional learning model; (2)There is interaction between learning model and critical thinking ability toward learning result moodle-based; (3) The learning result moodle-based using group investigation learning model with high critical thinking ability is better than using conventional learning model with high critical thinking ability; (4) The learning result moodle-based using conventional learning model with low critical thinking ability is better than using group investigation learning model with low critical thinking ability. Theoritically, this research result can be used as a direction to improve the learning model and evaluation tool base on e-learning. Furthermore, hopefully there will be a research which use learning model and evaluation tool base on e-learning with another independent variable that effect the learning result.

**Key Words:** *group investigation, critical thinking ability and learning result moodle-based*

### INTRODUCTION

As the developing of communication and information technology, education field also need innovations that acceptable with the era without neglect the human values and local wisdom. It is real that at the era of industrial revolution 4.0, teacher as professional educater with the main task transformating, developing and expanding knowledge and technology is asked to always do the learning innovations. The learning Innovation is on the choosing model and learning evaluation e-learning-based. *E-learning is learning model which is*

*arranged in order to use electronic system or computer so that able to support the learning process (Michael, 2013:27). This is in line with what Psycharis, and friends state that learning style at traditional learning is considered not relevant, while e-learning learning model is considered very important (Psycharis, Chalatzoglidis, & Kalogiannakis, 2013).*

One of *e-learning* application which can be used is moodle. *Moodle* is included in *Learning Manajement System* (LMS) that has important features which can support learning activities such as task, quis, and evaluation.

Moodle application in this research is used as media in delivering the material and learning evaluation. As we know that, today's learning evaluation is often to use manual learning evaluation. So that sometime students college feel reluctant and bore in doing learning evaluation.

Except learning evaluation, learning model is one important component and effect in the successful of learning process. One of learning model is cooperative learning model in group investigation. Cooperative learning is one of social learning model which is base on constructivism learning theory. Cooperative learning emphasize on students' involvement at group learning. The students' involvement in the group gives the chance for them to evaluate and improve the knowledge (Agus Suprijono, 2012:55).

That is why, in order to determine the model and learning evaluation which suitable with students' character, educator is also need to determine the students' critical thinking ability. This is also shows that there is interaction between learning model and critical thinking ability toward students' learning result (Nashar, 2015). So that, the students will be

more comfortable and happy in learning process activity.

### **E-Learning Moodle-Based**

E-learning is a learning process which using electronic media especially internet as the learning system. E-learning implements long distance learning using internet and computer technology (Setiyo & Anang, 2013). So that e-learning is a basic and logic consequence of the development of communication and information technology. E-learning represents the innovative ideas in term of learning, provides fast acces of knowledge and specific information (Sheshasaayee & Bee, 2017). E-learning is innovation that could be used in learning process, not only in delivering material, but also in the changing of several students' competencies included learning evaluation case. Through e-learning, students not only hear the material from the aducater, but also be active in observing, doing, demonstrating, evaluating and etc. The learning marerial can be virtualized in several formats so that can be more interesting and dynamic in motivating students well in learning process (Wiwin Hartano, 2016).

One of the causes of the increase of e-learning use in education institution is the availability of LMS software (learning management system). One of LMS software open source is Moodle. Cole and Foster (2008) define Moodle as the abbreviation of *Modular Object-Oriented Dynamic Learning Environment* which the meaning is dynamic learning place using object oriented model. Moodle application at the first time is developed by Martin Dougiamas in 2002 with Moodle version 1.0. Moodle is designed using pedagogic principals for helping educator in making effective e-learning system. Moodle has important features which can support learning activities such as task, quiz, online discussion, evaluation, score processing, displaying scores and transcript, and also uploading many kinds of formats of learning material.

### **Investigation Group Learning Model**

Soekamto in Trianto define the learning model is conceptual frame that showing the systematic procedures in organizing learning experience to achieve certain learning objective and the function is as direction for learning designers and educators in planning learning

activities (Trianto, 2007:5). Base on that opinion can be concluded that learning model can be determined as a way or tool to condition a classroom atmosphere that allows learning.

One of the learning models is cooperative learning. Base on Sanjaya's opinion cooperative learning model is learning activity series which is done in certain groups to achieve the certain learning objective (Sanjaya,2013:241). This is in line with Sugiyanto's statement that cooperative learning is a learning that focus on the use of small group students to work together in maximazing learning condition in order to achieve the learning objective (Sugiyanto, 2010:37).

Cooperative learning is one of social learning model base on constructivism learning model theory. According to Slavin, cooperative learning model has several differences. However, cooperative learning can be categorized according to six characteristics: (a) group abjective; (b) individual responsibility; (c) the same chance of success; (d) team competition; (e) task specialization and (f) the adaptation toward group necessity. (Slavin, 2009:26).

Presseisen in Sharan, determining the correlation of cooperative learning and improved way of thinking as a natural result from cognitive improved psychology (Sharan,2012:262). Because of that, it allows the students to always investigate the solutions or ideas which can strengthen the argumentation from each group. Here is the students' critical thinking arise. Although the basic principle of cooperative learning is not changing, there is several variations of the model. One of them is investigation group learning type. Investigation group model is one type of cooperative learning using small groups that consist of 4 or 5 students. Each member of the group is heterogen base on their own achievement, gender, and etnic. The students choose the topic to be investigated and do the investigation, next the students prepare and present the report to al classroom and finish the activities by doing evaluation and feedback.

The students in investigation group learning model are asked to be more active in developing their attitude and knowledge according to their own ability in constructing their own knowledge. Cooperative interaction and communication among students will

achieve the best result if only it is done in small groups so that cooperative attitude will always be there. investigation group learning model will be more effective if the educater understands the important component in cooperative learning. Moreover, in investigation group learning model the educater is only act as a interviewees and facilitator. The educater oversee the process of the investigation group, to see whether they can manage the task or not, and to help each group difficulties in interaction, including their performance in doing their tasks related to the learning. (Slavin, 2009:217). The procedural of investigation group learning model is base on cooperative ways which consist of six steps or phases according to Sharan, and friends. (Trianto,2007:80).

### **Critical Thinking Ability**

According to Paul dan Elder, critical thinking is a way for someone to improve the quality of thinking result using thinking sistemization technique and produce intelektual thinking ability in the ideas (Imron, 2013). Someone with critical thinking will be able in solving many problems well. Moreover, she or he can use the abstract idea to make problem

solving model effectively. In other side, Stine states that critical tniking is mental activity in order to connect or compare the fact, object, human being, attitudes, and many things that can be achieve by the brain (Stine, 2003:119).

According to Ennis in Hassoubah, critical thinking is think reasonedly and reflective by emphasizing on considering the decision about what should be done or believed (Hassoubah, 2007:87). Because of that, the indicator of critical thinking ability can be derived from students' critical activity as (a) Finding the clear statement from each question, (b) Finding the reasons, (c) Trying to understand the information well, (d) using the credible source and mentioning it, (e) Considering the condition and situation totally, (f) Trying to be relevant with the main idea, (g) remembering the basic and original importance, (h) Finding alternative, (i) open minded, (j) Taking the position when there is enough evidence to do something, (k) Finding as many as explanations, (l) Behave systematically and regularly with all components of the problems.

Think critically commonly need a high thinking ability more than knowing,

understanding, applicating, analyzing, synthesising and evaluating. However the ability can be trained to improve, which is integrated in learning for the thinking improving. The critical thinking ability is student ability in collecting some information and then making a conclusion of the evaluation from the information itself. The process of concluding is determined as critical thinking, which produces creative thinking. Thinking critically is affected well by basic knowledge, mastery of learning material will allows students to improve their knowledge with the critical ability itself.

### **Hypothesis Development**

The hypothesis in this research were

1. Moodle-based learning outcomes of the group which was applied investigative learning method was higher than the group which was applied conventional learning method.
2. There was an interaction between learning method and critical thinking skills on moodle-based learning outcomes.
3. A group that was applied investigative learning method and had high critical thinking skills showed higher result of

Critical Thinking ability(B)	Hig	Lo
	h	w
Learning Method (A)	(B1	(B2
	)	)
Group	A1	A1
Investigation (A1)	B1	B2
Conventional (A2)	A2	A2
	B1	B2

moodle-based learning outcomes than a group which was applied

learning result moodle-based. *Desain Treatment by level 2x2* can be drawn as follows.

conventional method.

4. A group that applied investigative learning method and had low critical thinking skills showed lower result of moodle-based learning outcomes than a group which was applied conventional method.

## RESEARCH METHODS

This research methodology is experiment, and the arrangement of the applied experiment is *desain treatment by level 2x2*. In this research, there are two variables, they are two independent variables, learning method consist of investigation group learning method (A<sub>1</sub>) Conventional Learning Method(A<sub>2</sub>), and students critical thinking consist of high critical thinking ability (B<sub>1</sub>) and low critical thinking ability (B<sub>2</sub>), and one dependent variable, Y =

Information:

*A<sub>1</sub>B<sub>1</sub>* : Learning result moodle-based toward the students that given investigation group learning method and having high critical thinking ability.

*A<sub>1</sub>B<sub>2</sub>* : Learning result moodle-based toward students that given investigation group learning method and having low critical thinking ability.

*A<sub>2</sub>B<sub>1</sub>* : Learning result moodle-based toward students that given

Conventional learning method and having high critical thinking ability.

*A<sub>2</sub>B<sub>2</sub>* : Learning result moodle-based toward students that given Conventional learning method and having low critical thinking ability.

The subject of this research was the students of Historical Education of FKIP Untirta from Semester one which consist of two classrooms, and each classroom is consist of 40 students. Before being given the treatment, the students were given questionnaire for getting the data score of students' critical thinking ability. Next, the result was arranged from the higher to the lower. Then, it was divided into 2 groups, they were group scoring of high critical thinking ability (50%) and group scoring of low critical thinking ability (50%).

The data of this research involves the data of kebantenan study learning result which was taken by using test instrument of learning result moodle-based in the form of multiple choice and the data of critical thinking ability

which was taken by using instrument in form of skala likert.

According to validity examination result of test question, learning result shows that from totally 45 questions, it was considered there are 40 questions were valid. The questions with the level of moderate difficulty and with different power with sufficient minimum criteria 40 questions. While the result of reliability test shows that reliability indeks 0,9067 which means that the reliability of the questions is so high.

Hypothesis examination in this research using technique analysis of two way (Anava 2x2), because the total number of n/se was the same karena jumlah n/sel sama, so the calculation of further testing using uji Tukey. before being analysed using Anava it was done test requirement analysis earlier. Anava is earlier being done test requirement analysis involve normality and variansi homogeneity examination. For seeing the normality data there would be used lifitors examination, while for seeing the variansi homogeneity with uji Bartlet.

## **RESULT AND DISCUSSIONS**

According to test requirement analysis, and calculation of analysis result it shows that  $L_{maks}$  score for each group is lower than  $L_{tabel}$  score. It means that at the significance level 0,05 zero hypothesis ( $H_0$ ) for each group is accepted. All the samples are come from the population with normal distribution and has the same variansi (homogen), then next hypothesis with two ways variansi analysis could be done in order to know whether there is different effect between critical thinking ability learning method and its interaction toward learning result moodle-based.

Calculation result of Tukey test hypthesis one to four shows that  $H_0$  is rejected and  $H_1$  is accepted. Here is the tabel of Tuckey test result.

Groups	$Q_{hitung}$	$Q_{tabel}$	Conclution
being compared			
A <sub>1</sub>			
and	3,20	2,94	Significant
A <sub>2</sub>			
A <sub>1</sub> B <sub>1</sub>			
and	4,75	3,95	Significant
A <sub>2</sub> B <sub>2</sub>			
A <sub>1</sub> B <sub>1</sub>			
and	6,34	3,95	Significant
A <sub>2</sub> B <sub>1</sub>			
A <sub>1</sub> B <sub>2</sub>			
and	6,82	3,95	Significant
A <sub>2</sub> B <sub>2</sub>			

Calculation result of Tuckey test shows that moodle-based learning result of students that given the learning using investigation group learning method is higher than the students that given the learning using conventional learning method because investigation group learning asked the students to be individually responsible toward the task. This research result shows that by the learning method and critical thinking ability can affect the the students' learning result. It is concluded

that there is an effect from learning method and critical thinking ability toward learning result moodle-based. At the students with high critical thinking ability, the learning result moodle-based which given investigation group learning method is better than the students' learning result which given conventional learning method. This is due to the investigation group learning method and the work on moodle-based questions asked the students more to think critically. At the students with low critical thinking ability, the learning result moodle-based which given investigation group learning method is much lower than the students' learning result which given conventional learning method. This is due to the investigation group learning method and the work on moodle-based questions asked the students more to think critically, so that each students with low critical thinking ability couldn't acceptt the learning process well and got difficulties in doing the questions e-learning-based.

## CONCLUSIONS

According to calculation result on research hypothesis testing, it was concluded

that: First: research result shows the learning result moodle-based which given investigation group learning method is better than the students that given conventional learning method. Second: there is an interaction affect between learning method and critical thinking ability toward learning result moodle-based. Third: the research result shows learning result moodle-based to the students with high critical thinking ability that given investigation group learning method is higher than the students that given conventional method. Fourth: the research result shows learning result moodle-based to the students with low critical thinking ability that given investigation group learning method is lower than the students that given conventional method.

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