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Improving students critical thinking skills using a research based practice on Tourism Geography Materials

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Abstract. This study aims to test research based practice whether the learning is better for geography students' critical thinking skills in the tourism geography material. The subjects in this study were third semester students of the Department of Geography Education at the University of Jember Academic Year 2018-2019. Class determination is chosen using simple random sampling. While the method in this study uses pretest-postest control group design. The result is known that students' critical thinking ability uses research based learning higher than students with conventional learning.

1. Introduction

Education is a process of forming intellectual and emotional basic skills which is an effort to develop quality human qualities that are useful for the progress of the nation and state. In essence, there are many examples to achieve the quality of education, one of which is consciously responsible activities carried out by an educator to improve the quality of learning well for students. Therefore, for the sake of improving the quality of education, a good quality of Human Resources is needed.

Quality human resources can be described as critical thinking individuals, namely resources that have a high intellectual level. This is in line with the statement of Dolan and Grady [3], which suggests that students enhance their critical thinking attributes through actual science investigation activities at the undergraduate level.

Geography learning in its implementation, there is material that is not only done by theory but must be combined with research. This is so students can construct their own knowledge. The process of understanding and taking values from the material studied requires high-level thinking skills, including the ability to think critically. Critical thinking skills are one of the thinking skills that need to be improved. This is in line with the opinion of Panita Wannapiroon [4] which states that students agree to learning with a research-based learning model that is at a high level of satisfaction.

In overcoming this problem there is a model that is expected to be a solution, namely research-based learning (RBL). RBL is one of the models applied in the 2013 curriculum. The focus on this model is that learning is based more on students. By using this model students can construct their own knowledge. Students can create works that can be fostered by themselves and others. Students can connect theory to the real world.

In the opinion of Arifin [1] there are 3 steps of learning Research Based Learning models, namely: (1) Exposure Stage which is done to determine the students' initial abilities. (2) Experience Stage is the stage of providing experience by carrying out research. (3) Capstone Stage is the final stage of research by presenting research results verbally and in writing.

The advantages of this RBL model are expressed in a study [2] that the application of the Research Based Learning model can improve students' science learning. Based on the description, the purpose of this study is to find out the application of research based learning models to improve students' critical geographic thinking on tourism geography courses.

2. Methods

2.1 Research Design

This study aims to determine the application of research based learning models in improving students' critical thinking. The population of this research is all students in the Geography Education Study Program at the University of Jember. Next, the sample in this study is semester 3 students. Based on the objectives formulated, this study uses a Pretest-Postest Control Group design, where the subjects consisted of the experimental class and the control class. The experimental class was given treatment in the form of a Learning Based Learning model while the control class was compared by using lecture and assignment models.

Table 1. Research Design

Class	Pretest	Treatment	Posttest
Experimental	X1	O	X2
Control	X1	-	X2

Source: Sugiyono, 2010

Description:
X1 : Pre test before learning
X2 : Post test after learning
O   : Treatment using a model of Research Based Learning
 -   : Treatment using lectures, discussion, question and answer, and assignment

2.2 Treatment

This study aims to measure students' critical geographic thinking between the experimental and control classes. In this study consisted of several treatments given to the experimental and control classes. The treatment of this study includes the following activities:

First, determine the research subject for the experimental and control classes. Determination of the experimental class and control class is done by looking at the average UTS semester scores. Based on these values, the experimental class is class A, while the control class is class B.

Second, the activities carried out at this stage are to do the pretest on each class to determine the students' initial abilities. The pretest problem consists of 5 essay questions. Then give treatment to the selected class. The treatment is: the experimental class is treated using the Reaearch Based Learning model in class A and class B control class with learning through lectures and assignments. Treatment in each class was conducted three times. Each meeting is for 2 hours of lessons or for 90 minutes

Third, classifying students in high, medium and low ability groups in both the experimental class and the control class.

Fourth, at this stage the experimental and control classes were each given a posttest. Posttest is done to find out the final ability of students after carrying out learning. The posttest performed still uses the same questions when holding a pretest. After that, the average posttest score was reduced by the pretest score which resulted in the gain score of the ability to learn geography (Seniati et al, 2009). Based on the gain score of the experimental and control classes, the analysis was then carried out and described the application of the technology based learning model in improving students' critical thinking.

The grouping of students is based on the opinion of Rahmat (1998) which can be formulated in the following

Table 2. Category of Student Groups

Interval	Category
$X > \overline{X}_{ideal} + 0{,}5\ S_{ideal}$	Tinggi
$\overline{X}_{ideal} - 0{,}5\ S_{ideal} \leq X \leq \overline{X}_{ideal} + 0{,}5\ S_{ideal}$	Sedang
$X > \overline{X}_{ideal} - 0{,}5\ S_{ideal}$	Rendah

Then the results of the gain index calculation are interpreted into categories according to Meltzer (2002), namely:

Table 3. Gain Classification (g)

Gain Amount (g)	Interpretation
$g \geq 0,7$	High
$0,3 \leq g < 0,7$	Medium
$g < 0,7$	Low

3. Results and Discussion

The data in this study are students' critical geographic thinking skills between classes that are treated through the learning process using research based learning models and classes that are treated with lecture, question and answer, and assignment methods. The geography learning results are obtained from gainscore or calculating the difference between the student's initial ability score (pretest) and the student's final ability (posttest). The results of geography learning assessed were students' critical thinking skills in tourism geography material.

Measurement of learning outcomes in this study was obtained by using essay tests totaling 5 items. Before the question is tested first consulted and validated by tourism geography material experts and learning design experts. After consulting the results, there are discrepancies, one of which is the essay question in the Learning Implementation Plan (RPP), there is one that is not in accordance with the question grid, while the content of the material and the question of pre-test and post-test are good enough.

After revision, the instrument was tested before use. Based on the results of the test of the geographic critical thinking ability test instrument carried out in class A Geography Education Study Program FKIP University of Jember on 27 August 2018, it was found that the test instrument had fulfilled the prerequisite test and was feasible to use. The prerequisite tests include tests of difficulty, differentiation, validity, and reliability. The results of the analysis of learning outcomes tests for each item can be seen in the following table 4.

Table 4. Instrument Test Results

No	Difficulty Level	Criteria	Difference level	Criteria	Validity test	Citeria	Realibility test	Criteria
1	30%	Good	0,45	Good	0,609	Valid		
2	37%	Good	0,53	Good	0.737	Valid		
3.	38%	Good	0,32	Enough	0.583	Enough	0,701 > 0,273	Reliable
4	40%	Good	0,48	Good	0.722	Valid		
5	47%	Good	0,55	Good	0.752	Valid		

Source: Results of 2018 Data Processing

Based on table 4 above, it was found that the prerequisite trials included the test of the level of difficulty, differentiation, validity, and reliability of all questions that were good enough and feasible to be tested on the experimental class and the control class.

After being tested in the experimental class and the control class, data obtained from the students' geographic critical thinking skills included data on students' initial abilities (pretest) and students' final ability (posttest).

Data on students' initial abilities is obtained through giving treatment about the material to be taught by the teacher. The treatment includes the Pretest and Posttest. Pretest is given to the experimental class and the control class before receiving treatment or learning. The results of the pretest were used to determine the size of the students' initial abilities between the experimental class and the control class. The pretest that has been implemented in both the experimental class and the control class results in different students' initial abilities.

While Postest is used to determine the level of final ability of students after being given a learning treatment. Posttest data was obtained after each student in the experimental and control classes received learning treatment about tourism geography material. Posttest questions are given using the same questions when given the initial ability of students (pretest).

Testing the hypothesis in this study (H1) is paired with the hypothesis (H0). H0 is tested using the t-test formula. The t-test is used to find out the hypothesis of difference or influence. If it is proven to be significant, then H0 is rejected and H1 is accepted as a result of the study. Conversely, if it is not significant, then H0 is accepted and H1 is rejected. The two hypotheses are formulated as follows.

H0 : The Research Based Learning model has no effect on ability students' geography critical thinking skills.

H1 : The Research Based Learning model influences students' geography critical thinking skills.

The results of data analysis using statistical analysis with parametric t-test, namely the independent samples test shows that the t-count score is 3.225 and the significance of 0.000 means $p < 0.05$. In this experiment H0 was rejected and H1 was accepted as a result of the study. This shows that the Research Based Learning model influences students' critical geography thinking skills.

The implementation of learning using the Research Based Learning model is able to provide a significant influence on students' critical thinking skills. This can be proven that the pretest results are known to have a significant difference between the students' critical thinking skills in the experimental class and the control class. Therefore, because there are significant differences, it is continued by giving treatment, namely for the experimental class given by the research based learning model and the control class using the usual model namely lecture and assignment.

This treatment is used to see an increase in students' critical thinking skills. After that, a mean difference test on the data gain score was tested using the t-test. Gain score is a score obtained by reducing the posttest score with the pretest score. So that the results show that the critical thinking skills of the experimental class students are better than the control class. This can be seen as an average increase in critical thinking skills of experimental class students at 0.74, which means high. while the control class is 0.43 which means medium.

Table 5. Mean pretest, Posttest, and Gain Ability of Thinking critically Students Based Student Groups

| Student Groups | mean the ability of critical thinking of students | | | | | |
| | High | | Medium | | Low | |
	RBL	Ordinary	RBL	Ordinary	RBL	Ordinary
Pretest	7,866	6,470	5,758	7,345	7,070	6,221
Postest	23,302	14,720	21,297	13,158	22,920	12,276
Gain	0,873	0,462	0,671	0,427	0,681	0,394

Source: Results of 2018 Data Processing

Based on the table 5 above, it can be concluded that the statistical test obtained shows that there is no significant difference in critical thinking skills of the control class students in terms of pairs of student groups. In addition, there are several findings when conducting research-based learning (RBL), among others: a) giving meaning to the more contextual tourism geography courses through the presentation of research results; b) students are able to strengthen their thinking skills as researchers; c) increase students' understanding of a science they can at the time of research.

4. Conclusion

Based on the results of the study, it can be concluded that the research based learning model can improve students' geographic critical thinking. The mean value of experimental class geography learning outcomes is higher than the control class. This shows that the steps in the research based learning model that requires students to conduct research in tourism geography courses and their research results are discussed jointly by students and lecturers.

References

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