

# Discovery Learning Model Assisted by Google Classroom and Zoom Efforts to Improve Critical Thinking Ability of Geography Education Students

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Informasi artikel	ABSTRAK
<i>Sejarah artikel</i> Diterima : 10 Dec 2020 Revisi : 28 Feb 2021 Dipublikasikan : 31 Mar 2021	Tujuan dari penelitian ini untuk mengetahui pengaruh model <i>Discovery Learning</i> berbantuan <i>Google Classroom</i> dan <i>zoom</i> pada matakuliah Pendidikan Lingkungan Hidup terhadap kemampuan berpikir kritis mahasiswa Pendidikan Geografi Universitas Khairun. Pendekatan penelitian yang digunakan adalah <i>quasi experiment design</i> dengan rancangan <i>experiment pretest-posttest control group</i> . Analisis data dengan statistik parametrik untuk uji hipotesis yaitu analisis kovarian (Ancova) dengan menggunakan <i>SPSS 22 for windows</i> dengan taraf signifikansi 0.05. Penelitian dilaksanakan di Prodi Pendidikan Geografi, Universitas Khairun dengan responden mahasiswa yang mengontrak matakuliah yang berjumlah 37 mahasiswa Pendidikan Lingkungan Hidup. Hasil dari penelitian ini menunjukkan adanya perbedaan pengaruh pembelajaran antara model <i>discovery learning</i> dan konvensional yang sama-sama menggunakan <i>google classroom</i> dan <i>zoom</i> terhadap kemampuan berpikir kritis mahasiswa dengan nilai Sig. 0,00.

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## Keywords:

Discovery Learning  
Google Classroom  
Zoom  
Critical Thinking

## ABSTRACT

The purpose of this study was to determine the effect of the Discovery Learning model assisted by Google Classroom and zoom in the Environmental Education course on the critical thinking skills of Khairun University Geography Education students. The research approach used was a quasi experimental design with a pretest-posttest control group experimental design. Data analysis with parametric statistics for hypothesis testing, namely covariance analysis (Ancova) using SPSS 22 for windows with a significance level of 0.05. The research was carried out in the Geography Education Study Program, Khairun University with student respondents who contracted the Environmental Education course. The results of this study indicate that there is a difference in the effect of learning between discovery learning and conventional models that both use google classroom and zoom on students' critical thinking skills with the Sig. 0.00.

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## Introduction

A change in the educational paradigm was carried out to improve the quality of education, especially in tertiary institutions. At this time, teaching is directed to be centered on students (student centered), while lecturers (lecturers) become facilitators. Lecturers as learning partners function as guides (guide on the side) for students (Johanes, 2019). This paradigm requires lecturers to be more creative in developing learning, in order to enable students to excel through real activities, and to optimally develop students' critical thinking skills. This can be done through the application of innovative learning models that

utilize information technology as a learning aid.

Information technology is experiencing rapid development and plays an important role in learning activities in the 21st century era (Triyanto et al, 2016). 21st century learning encourages the integration of technology and information in the form of ICT (Information and Communications Technology) in education. One of the ICT engagements in learning is through the use of Google Classroom or Google Class. Google class is a learning application issued by Google to facilitate learning via the internet and cellphones, and can help educational institutions towards an online and paperless

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system. This online system is very helpful in conditions where face-to-face learning is not possible, and is environmentally friendly. Google classes are not only easy to use, can save time, are cloud-based, flexible, and free (Janzem in Iftakhar, 2016). This is a consideration that google classes can be used on campus.

One learning model that can hone students' critical thinking skills is the discovery learning model. The application of discovery learning has the advantages of helping students to improve and improve cognitive skills and processes. This model is an innovative learning model that emphasizes active learning in discovering concepts, namely finding the truth through self-learning. The discovery activity can aim to find concepts and solve problems (John & Ganiu, 2016). The application of the discovery learning model can increase the intellectual power of students, thus revealing new hopes for success, learning to organize, facing problems and trying to find solutions to their own problems. (Khofiyah & Santoso, 2019).

Discovery learning models can be used to improve critical thinking skills with problem-based learning (Wartono et al., 2018). This learning is based on questions based on scientific disciplines and students' investigations take place under the guidance of the teacher limited to the scope of the class, while problem learning begins with meaningful real-life problems where students have the opportunity to choose and carry out the necessary investigations to solve problems.

The Environmental Education course is one of the courses that discusses issues related to the environment and population, as well as the relevance and implications of population problems with the environment in the Geography Education Study Program, Khairun University. The implementation of discovery learning is considered very relevant for environmental learning, the constructivism of knowledge and attitudes that originate from self-discovery or groups, in this case learning is not only the transfer of knowledge, but learning is the process of compiling knowledge carried out by students through various experiences in solving problems. encountered (Triyanto et al., 2016). For this reason, a study

was conducted with the aim of knowing the effect of the Discovery Learning model assisted by Google Classroom and Zoom in the Environmental Education course on the critical thinking skills of Khairun University Geography Education students.

### **Method**

The method used was a quasy experimental design with a pre-post-test non-equivalent control group design. Data analysis was performed using descriptive statistics to describe the results of the study in general and parametric statistics for hypothesis testing, namely covariance analysis (Ancova) using SPSS 22 for windows with a significance level of 0.05. The research was carried out in the Geography Education Study Program on September 21 - October 5 2020, Khairun University, subject of Environmental Education. The research sample consisted of 2 classes, namely 1 experimental class and 1 control class.

The experimental class was treated with discovery learning with google classroom and zoom with a total of 18 students. Control class with conventional learning treatment with google classroom and zoom with a total of 19 students. The data obtained were in the form of quantitative data derived from the measurement of critical thinking skills as measured by using essay test questions.

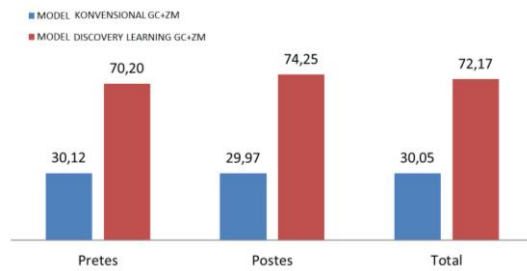
### **Result and Discussion**

The results showed that the average score of critical thinking skills in the Discovery Learning learning model using google classroom and zoom was better than the conventional learning model using google classroom and zoom. For more details, students' critical thinking skills are presented in table 1 and graph 1 below:

Tabel 1. Descriptive Statistics

Learning Model	Dependent Variable: Critical Thinking Postes		
	Mean	Std. Deviation	N
Conventional with GC + ZM (Control / Class B)	70.1995	2.48928	19
Discovery Learning with GC + ZM (Treatment / Class A)	74.2456	2.85408	18
Total	72.1678	3.33889	37

Source : Research result, 2020



Graph 1. Average of Discovery Learning

Model Pretest and Posttest Scores with Google Classroom and Zoom and Conventional with Google Classroom and Zoom

Tabel 2. One-Sample Kolmogorov-Smirnov Test

	Critical Thinking Pretest	Postes of Critical Thinking
N	37	37
Normal Parameters <sup>a</sup>	Mean	30.0492
	Std. Deviation	3.75350
Most Extreme Differences	Absolute	.261
	Positive	.125
	Negative	.125
Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)	.127
		.094
		.760
		.610

a. Test distribution is Normal.

Source : Research result, 2020

The results of the data normality test showed that the data group pretest critical thinking score and critical thinking posttest were normally distributed

Graph 1 above explains the difference between the pretest and posttest values in the discovery learning model using google classroom and zoom and conventional using google classroom and zoom.

As a requirement for analysis of covariance (ANACOVA), previously tested for the normality of variable data. This normality test is expected to show that the data sample comes from a population that is normally distributed. Covariance test (ANACOVA) can be used if the data for each variable is normally distributed.

#### A. Normality Test of Students' Critical Thinking Ability

The normality of the data was tested using the one-sample Kolmogorov-Smirnov non-parametric statistic. The data normality test criteria is, if the probability value (sig.) Of each dependent variable tested is higher than the alpha value used (0.05), then H0 is acceptable, meaning that there is no deviation from the normality of the independent variable data. Thus, the data is considered normally distributed. The results of the data normality test are presented in table 2 below.

and there was no deviation from the normality of the data. This can be seen with the Sig.

B. Homogeneity Test of Students' Critical Thinking Ability

The homogeneity test is expected to show that two or more data groups come from a population with the same variance. The homogeneity test was carried out for the corrected average data of each group of data science processing skills scores. The homogeneity of the data was tested using Levene's Test of Equality of Error Variances. The data homogeneity test criteria is, if the probability value (sig.) Of each dependent variable is more

significant than the alpha value (0.05), then H0 is acceptable, meaning that there is no difference in variance between data groups. Thus, the data are considered homogeneous. The probability value (Sig.) The data variant of the science process skills score was significant more than 0.05. Thus, it can be concluded that there is no difference in variance between data groups so that the data is considered homogeneous. The results of the variance data homogeneity test are presented in Table 3 below.

Tabel 3. Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Critical Thinking Pretest	1.262	1	35	.269
Postes of Critical Thinking	.120	1	35	.731

Source : Research result, 2020

C. Hypothesis Testing with Covariance Analysis (ANACOVA) The Effect of Learning Models on Students' Critical Thinking Ability

Statistics are then used to show the effect of the learning model on students' critical thinking skills using the Covariance test (ANACOVA). The significance value is smaller than the  $\alpha$  value (0.05),

meaning that H0 is rejected. Ho's rejection means the HI hypothesis which states that there is an effect of the learning model on students' critical thinking abilities. This shows that the two models applied in the Environmental Education (PLH) course have a different effect on students' critical thinking skills. The summary of the results of the analysis of covariance (ANACOVA) is presented in table 4 below:

- a. R Squared = .382 (Adjusted R Squared = .345)

Tabel 4. Tests of Between-Subjects Effects

Source	Dependent Variable: Postes of Critical Thinking			
	Type III Sum of Squares	df	Mean Square	F
Corrected Model	153.226 <sup>a</sup>	2	76.613	10.499
Intercept	2739.901	1	2739.901	375.467
Pretes	1.907	1	1.907	.261
Model_Belajar	151.957	1	151.957	20.824
Error	248.109	34	7.297	
Total	193104.617	37		
Corrected Total	401.335	36		

Source : Research result, 2020

Based on the results of the correction of the average score of critical thinking skills for the two learning models, as well as based on the

Covariance Test Hypothesis (ANACOVA), it can be concluded that the discovery learning model is better at improving the critical thinking skills of Geography Education students in the Environmental Education course by using the

application. Google Classroom and zoom compared to conventional learning models using the Google Classroom and Zoom applications. The results showed that discovery learning helped improve the effectiveness of student learning on critical thinking skills because students were trained to think critically through the steps of providing stimulation, identifying problems, collecting data, processing data, proving, and drawing conclusions. This shows the results are in accordance with the results of research which shows a significant influence on the critical thinking ability of geography students by using discovery learning in the Meteorology and Climatology subjects. (Nurrohmi et al., 2017), and critical thinking skills of students on abiotic and biotic environmental materials that can be improved through the application of discovery learning models (Hanim, 2019). However, the results of this study do not use the google classroom and zoom application in the application of discovery learning. Discovery learning as a learning model can encourage students to find knowledge through activities of providing stimulation, identifying problems, collecting data, processing data, proving, and drawing conclusions. This model has two main processes, namely involving students in asking or formulating questions and finding answers to problems through a series of statements (D, 2014). The Discovery Learning model maximally involves all students' abilities to find and to investigate systematically, critically, and logically, so that they can discover their own knowledge, attitudes, and skills.

Indicators of critical thinking skills such as basic clarification (formulating, analyzing, and asking and answering), observing, considering, identifying, and concluding (Nuryanti et al., 2018; Santi et al., 2018) It has been carefully planned and implemented in discovery learning steps with Google Classroom and Zoom. In conventional model learning with google classroom and zoom, learning scenarios by lecturing and question and answer.

The ability to think critically can be improved through discovery learning model (Wartono et al., 2018). Discovery learning provides students with experiences to be brave in facing situations and assignments that allow students to "discover" their own concepts or subject matter (Wilke & Straits, 2020).

## Conclusion

The results of the study concluded that students' critical thinking skills were better with discovery learning models with google classroom and zoom than conventional learning with google classrooms and zoom with sig value. 0.00. Discovery learning with google classroom and zoom can improve students' critical thinking skills so that this learning model can be an alternative learning to develop students' critical thinking abilities and skills.

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