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Effectiveness of *Problem Based Learning* Model with *Google Classroom* Assistance on Learning Outcomes

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Abstract

Learning in the current globalization period makes the government ready to implement a new curriculum update, namely the independent curriculum to encourage students to have the ability to solve problems. Problems based on data review in the field show that students are less accustomed to analyzing problems in economic lessons. Teachers need to innovate in the application of learning models and media. This study aims to analyze the effectiveness of *Problem-based learning* with *google classroom* to improve the economic learning outcomes of students in class XI IPS at SMA Negeri 107 Jakarta. This research uses a quantitative approach with a *quasi-experimental* design. The results of hypothesis testing show a significance value of 0.000 <0.05, tcount (7.268) > t table (1.99444) and the experimental class n-gain test of 0.41978 is higher than the control class of 0.223826. The conclusion of this study is that the *problem-based learning* model through *google classroom is* effective for improving the economic learning outcomes of class XI IPS at SMA Negeri 107 Jakarta.

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INTRODUCTION

Education is an effort to provide knowledge, insight to everyone in developing talent, personality, character and way of thinking. According to Law No.20 of 2003 Chapter II Article 3, national education functions to develop abilities and shape the character and civilization of a dignified nation in order to educate the nation's life, aims to develop the potential of students to become human beings who are faithful and devoted to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. (Ministry of Education, 2003)

In the development of the 4.0 era in the 21st century today to answer global challenges and to be able to compete globally, everyone must have extensive knowledge, therefore students must equip with competencies during the education process. The basic competencies that students must have are creativity in cross- cultural understanding, having personal and social responsibility and the ability to make the right decision as a solution to the problem at hand. Efforts to facilitate the achievement of these competencies include improving the ability to think in solving problems through the application of effective learning with learning models or methods. Learning innovation at this time strongly supports active activities in finding out and digging up information where students should not be passive just receiving knowledge from the teacher alone, so the role of the teacher in the learning process is to create a learning environment that stimulates student involvement in learning as one of the students' efforts to master the material in detail and relate the material in the life of real problems in daily activities. It needs to be understood by every learner that the theory in the handbook or learning module of each subject is closely related to social life problems but is less realized by students because they rarely understand the theory that is related to real daily activities. Therefore, teachers must be accustomed to bringing learning theories into real-life examples so that students better understand the existing theories and are able to formulate solutions to problems that are being discussed in learning materials. In 2021, the Government through the Ministry of Education and Culture has launched a prototype curriculum which will be further refined in 2022 and strives to be applied evenly nationally, namely the so- called independent curriculum. One of the characteristics of the independent curriculum is the existence of teaching modules as a tool for the continuity of learning activities in the classroom as well as other things as a characteristic of the independent curriculum, namely the cultivation of character education through the Pancasila Student Profile Strengthening Project or abbreviated as P5. The approach taken in P5 uses project and problem-based learning, which is fundamentally different from project-based learning integrated into school subjects.

Research Kardoyo et al. (2020) showed that the application of problem-based learning can provide an increase in students' critical and creative thinking. Restuti et al. (2021) revealed that problem-based learning will improve students' critical thinking skills and conceptual understanding. Hestiningtyas et al., (2021) ; Basith, A. & Amin (2017) also shows that high school students' critical thinking skills can improve by using the problem-based learning model.

The next innovation that teachers can do is the use of information technology in learning activities. Teaching and learning activities that are integrated with information and communication technology can improve the efficiency and effectiveness of learning. (Ministry of Education and Culture, 2016). Learning media based on information and communication technology is a must that is applied by teachers. (Adros & Oktarina, 2019).. The use of information technology in the learning process has led to a blended learning approach (Nurkhin et al., 2020). (Nurkhin et al., 2020).Learning innovation by combining problem-based learning and google classroom will further improve students' critical thinking skills in economics subjects. This statement is corroborated by research Qalbi & Saparahayuningsih (2021) which shows that the problem-based learning model can improve students' critical thinking skills.

According to previous research in the use of the Problem Based Learning model in economic subjects by Djonomiarjo (2020) said the effect of Problem Based Learning on learning outcomes in economics lessons with a problem-based learning

model the class using this model is more effective in improving student learning outcomes compared to conventional learning models that have been tested by data. It can be said that the difference in learning outcomes of these two classes is the effect of treatment. Tutik (2020) analyzes a comparative study of problem-based learning and Contextual Teaching and Learning (CTL) learning methods resulting in better economic learning achievement compared to the Problem Based Learning learning method, the results of this study make one of the backgrounds of this research made to maximize the use of models with google classroom learning media innovations.

The subjects that must be mastered in the high school education level are very diverse and all are very useful to equip each student in facing the globalization era after completing the compulsory education period, but it cannot be denied that not all students can fully master the available subjects. One of the subjects at the high school level, especially for students who are included in the social science group, is economics. From the results of interviews with several students who said that economics is difficult because not only must know the mere theory but must have the ability to count to be able to complete some of the existing material and reinforced again from the results of observations in general can be seen from the UNBK percentage data that has been carried out from the previous year economic subjects are still relatively low on a national scale.

The purpose of the research in this article is to analyze the effectiveness of Problem-based Learning with Google Classroom to improve the ability of economic learning outcomes of students in class XI IPS at SMA Negeri 107 Jakarta.

RESEARCH METHODS

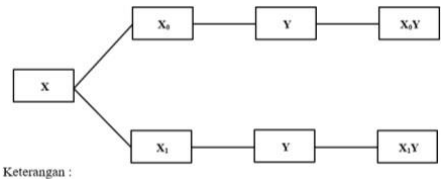
This research refers to a quantitative approach with a quasi-experimental research design. The quasi-experimental design used uses the Nonequivalent Control Group Design. The following is a table of quasi experimental design nonequivalent model.

Table 1. Research Design Nonequivalent Control Group Design

Class	Treatment	Posttest
Control (Problem Based Learning assisted by GCS + E-News)	X_0	O_0
Experiment (Problem Based Learning with GCS + Video)	X_1	O_1

Description:

X0 :Pre test given to the control class, X1 :Pre test given to the experimental class, O0 :Posttest given to the control class PBL learning model assisted by GCS + E-News media O1 : Ptestest given to the Problem-based learning model class assisted by GCS + Video media. the following research scheme:



X : PBL learning model
X0 : GCS-assisted PBL learning model + E- News
X1 : GCS-assisted PBL + Video Y : Learning Outcomes

The population in this study were all XI social studies students at SMA N 107 Jakarta in the 2022/2023 school year consisting of 4 classes or 144 students. The samples of this study were XI IPS 3 class students totaling 36 as the experimental class and XI IPS class students totaling 36 students as the control class. The research procedure is divided into three stages, namely the preparation stage, the implementation stage, and the reporting stage.

The data collection technique used tests and documentation. The data collection instrument used was a test. The test was used to measure the ability of students' learning outcomes before and after learning with the problem-based learning model through google classroom. The test was given in the form of multiple choice.

The research instrument trial consisted of validity test using bivariate correlation, reliability test using Cronbach alpha, question difficulty test, and differentiator test. While the data analysis technique was carried out with the help of the IBM SPSS Statistic 26 program, namely the normality test was carried out with the Kolmogrov Smirnov test, the homogeneity test was carried out with Levene's test, the hypothesis test was carried out with the independent samples t test and the n-gain test to determine the average increase between the pre-test score and the post-test score of the control class and the experimental class.

RESULTS AND DISCUSSION

Problem Based Learning through Google classroom in economics subject at SMA Negeri 107 Jakarta.

The problem-based learning model through Google classroom was implemented in the experimental class with a direct face-to- face scheme.

Treatment begins with preparing videos and media links for the learning module and preparing Google classroom content. Next, pre-learning was conducted online. The teacher first greeted and gave greetings to the students and directed the students to do the pre-test questions. The purpose of the pre-test question is to measure students' initial ability to the material to be given. After the pre-test process is complete, students can study international trade material that the teacher has provided in Google classroom in the form of

learning videos and electronic news links.

Learning content through google class room

The second treatment in the experimental class was carried out through face-to-face learning in the classroom. Face- to-face learning designed includes introductory, core, and closing activities. In the introductory activity, the teacher provides an apperception of the material that has previously been learned through google classroom, then relates it to the material to be conveyed. Learning objectives, indicators of competency achievement and the benefits of mastering the material as well as the designed learning scenario are explained before the teacher continues with problem-based learning by dividing the study group. In the core activities, students respond to some of the teacher's questions about the driving factors, inhibiting factors and policies in international trade. Furthermore, the teacher presents phenomena in international trade in the form of video shows entitled "Venezuela experiences an economic crisis", and "The phenomenon of price increases ahead of fasting, holidays and the New Year" as supporting material for the problem-based learning model that has been presented by the teacher in Google Classroom and presented in front of the class. Each study group conducts group discussions to critically analyze the problems that occur in learning videos and e- news. As a closing activity, the teacher provides a design of learning activities that will be carried out at the next meeting and motivates students to continue studying the material available on google classroom, each group also prepares a presentation of the results of group discussions.

Discussion by each study group in the experimental class

The next treatment in the experimental class is designed with three stages of activities, namely introduction, core and closing. Presentation and discussion of group analysis results became the core activities carried out in the experimental class, while other groups were given the opportunity to respond to the presentation and the teacher provided feedback. Discussion activities are ended by responding to learning reflections and the teacher provides conclusions, benefits and learning activities that have been carried out, the results of each group's discussion are uploaded to google classroom so that they can become learning materials by other groups, and are invited to continue the discussion. Before the closing activity in learning, students work on post test questions. The post test question aims to determine the ability of students after being given treatment on the material that has been studied. The activity ended with greetings and prayer.

Presentation of discussion results in the experimental class

Descriptive Statistical Analysis Results

Table 1. Description of *Pre-test* Results ofControl and Experiment Classes

Component	Control	Experiment
NumberofStudents	36	36
Average	69,64	65,67
Highest score	90	93
Lowest score	34	35

Source: Research Data processed, 2023

Table 2. Description of *Post-test* Results of Control and Experimental Classes

Component	Control	Experiment
Numberof Students	36	36
Average	67,2778	80
Highest score	92	98
Lowest score	75	75

Source: Research Data processed, 2023

Pre test data normality test

The normality test was conducted to determine whether the pretest and post test data of the control class and experimental class obtained were normally distributed or not. Normality testing is done with the Kolmogorov-Smirnov test using SPSS 26.

Table 3. Normality Test Results Pre test data of control class and experimental class students

Data	Kolmogoro Smirnov	v-Sig	Data Distributio n
Control	0,122	0,165	Normal
Experiment	0,125	0,199	Normal

Source: Research Data processed, 2022

Table 3 shows that the pre-test results in both classes come from a normally distributed population.

Homogeneity Test of Pre Test Data

The homogeneity test was conducted to determine whether the two classes had homogeneous variants or not on the pre-test scores of the control class and experimental class. The homogeneity test was carried out with the Levene's test using the help of SPSS 26.

Table 4. Homogeneity Test Results of Pre Test Data of control class and experimental class students

Levene's Staticctic	Sig	Conclusion
0,305	0,582	Homogeneous

Source: Research Data processed, 2023

Table 4 shows that the significance value of the homogeneity test of the variance of the pre-test data is 0.852 greater than the level of sig which is 0.05. Based on this, it can be concluded that the pre-test

scores in the control class and the experimental class tested are homogeneous.

Post Test Data Normality Test

Table 5. Normality Test Results of Post Test Data of control class and experimental class students

Data	Kolmogoro Smirnov	v-Sig	Data Distributio n
Control	0,140	0,07 3	Normal
Experime nt	0,119	0,20 0	Normal

Source: Research Data processed, 2023

Table 5 shows that the *post-test* resultsin both classes are normally distributed.

Post* Test Data Homogeneity *Test

Table 6. Results of Homogeneity Test of *Post Test* Data of control class and experimental class students

Levene's Staticctic	Sig	Conclusion
3,466	0,067	Homogeneous

Table 6 shows that the significance value of the homogeneity test of the variance of the post test data is 0.067 greater than the level of sig which is 0.05. Based on this, it can be concluded that the pre-test scores in the control class and the experimental class tested are homogeneous. Hypothesis Test

The hypothesis test used in this study is the independent samples t test with the decision-making rules used H0 is accepted if t count < t table and H0 is rejected if t count > t table or H0 is accepted if the sig value > 0.05 and H0 is rejected if the sig value < 0.05.

The proposed hypothesis is as follows: H0 :Problem based learning through google classroom is not effective in improving the ability of economic learning outcomes.

H1 :Problem based learning through google classroom effectively improves economic critical thinking skills.

The hypothesis test conducted shows that the t table = df = 72- 2 = 70) is 1.66691. then tcount > ttabel and when viewed from the significance value obtained 0.000 <0.05, which means H0 is rejected and H1 is accepted.

Table 7. Hypothesis test

Class	Average	Dk	thitung	ttabel
Control	67,27		7,26	
Experimen t	80	70	8	1,994

Source: Research data processed, 2022

Table 7 shows the average final test results of the control class of 67.27 and the experimental class of 80 with dk = 70. Based on table 7, the hypothesis test above shows that the sig value (2-tailed) of 0.040 <0.05 is a sig value lower than the average significant level of 5% (0.05), while the tcount value obtained is 2.095 greater than the ttable value of 1.66691. So the conclusion is that the t value is 2.095> t table value 1.66691, namely there is Problem-based learning through google class room effectively improves economic learning outcomes.

N-gain testTable 8. N-gain Test Results of Control and Experimental Classes

Class	Value of n-gain	Criteria
Experiment	41,978	Medium
Control	23,826	Low

Source: Research data processed, 2022.

Table 8 shows that there is an average pre-test to post-test score from the experimental class higher when compared to the control class. The acquisition of the control class n-gain value of 0.23826 is included in the low criteria, while the acquisition of the n-gain value in the experimental class of 0.41978 is included in the medium criteria.

The effectiveness of the problem- based learning model through Google classroom that is applied, has an influence on the ability to think critically, especially in economic subjects. Based on observations in the experimental class or class XI

IPS 3 which applied the problem-based learning model through Google Classroom provided a learning atmosphere that supported students to improve their critical thinking skills. The implementation of this learning model is by combining face-to-face learning and online learning together by utilizing information technology. Before face-to-face learning is carried out, the teacher provides online learning treatment in the form of learning that is carried out by utilizing technology, namely through google classroom. Learning through Google Classroom makes it easier for students to access various educational services that have been provided by teachers independently, anywhere and anytime flexibly. This makes students able to learn the material, before the material is delivered by the teacher in the classroom. While in face-to-face learning in the classroom the teacher presents problem-based learning that can stimulate to arouse students' curiosity to solve problems using the stages of critical thinking. This statement is supported by Nurkhin, et al. and Qalbi & Saparahuyingsih who stated that students' critical thinking skills can be improved by using a problem-based learning model. (Nurkhin et al., 2020; Qalbi & Saparahayuningsih, 2021). Lukitasari, et al (2019) also explained that problem-based learning can improve students' critical thinking skills in answering questions. Wahyudi, et al (2019) suggested that learning that combines learning with problem-based learning (PB2L) conducted for elementary school teachers is effective, valid, and practical to improve critical thinking skills. While Marnita et al., (2020) added that if problem-based learning is applied to students in thermodynamics courses, it will be able to improve critical thinking skills.

Constructivism theory explains that students are expected to organize experiences in learning with the aim of challenging students' mindsets so that new understandings will be formed through observation, data collection, formulating and testing hypotheses and then working with others (Schunk, 2012). (Schunk, 2012). The constructivism theory used is also based on Vygotsky's opinion on Vygotsky's sociocultural theory, that the social environment as a facilitator to be able to construct new ideas that can enhance student development (Schunk, 2012).

The constructivism theory described above is in line with this research. Through problem-based learning that combines face- to-face and online learning will support the theory of constructivism where students will have knowledge and understanding by actively seeking information by themselves with the help of technology. In addition, students will be able to set their own goals and can evaluate their progress so that their critical thinking will be more honed. The social environment is one of the places where students look for invaluable experiences that can also encourage students to learn. Through problem-based learning using Google classroom, it will encourage students to learn together with their social environment so that they can construct critical thinking skills in solving existing problems. If students' critical thinking skills improve, it indicates that students have skills in understanding problems, fluency, flexibility and novelty of problem solving (Siswanto in Kardoyo et al., 2020). Kardoyo et al., 2020).

Several studies conducted previously are also in line with the results of this study. Nurkhin et al. (2020) analyzed the effectiveness of problem-based learning in accounting students so that students' critical and creative thinking skills and learning outcomes increased. The implementation of the problem-based learning model is carried out with the help of google classroom and combines it with face-to-face lectures, the results show that it is able to make students get better grades than before being given this learning method. Hikmawati (2020) who implemented problem-based blended learning using google classroom application in order to have an impact on increasing students' information literacy and critical thinking. The results showed that there was a significant difference between -PBL when compared to conventional-PBL in biology subjects. Junipah et al., (2019) also conducted development research by implementing problem-based learning through learning whose implementation was assisted by google classroom to be able to analyze the effectiveness and practicality of the learning model. The results show that the development of the learning model carried out is effective for providing higher learning outcomes. Research Lukitasari et al. , (2019) in a cell biology course that applies problem-based learning to its effect on critical

thinking. The results showed that students' ability to answer questions increased after being given problem-based learning. There is also research Marnita et al., (2020) and Habibah et al., (2022) which revealed that by applying a problem-based learning model based learning got satisfactory results.

The review of the results of previous research with the results of this study is the basis for being able to conclude that the use of problem-based learning models through Google Classroom is effective in improving the critical thinking skills of XI social studies students at SMA Negeri 107 Jakarta in economics subjects on Price Index and Inflation material as evidenced by an increase in the learning outcomes obtained by students.

CONCLUSION

Based on the results of the study, it can be concluded that problem-based learning through google classroom is effective for improving the critical thinking skills of economic class XI social studies students. This is evidenced by the hypothesis test obtained ttabel = df = 72- 2 = 70) which is 1.66691. then tcount> ttable and when viewed from the significance value obtained 0.000 <0.05, which means H0 is rejected and H1 is accepted In addition, the increase in learning outcomes with the acquisition of the control class n-gain value of 0.23826 is included in the low criteria, while the acquisition of the n-gain value in the experimental class of 0.41978 is included in the medium criteria.

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