

IMPROVING STUDENTS' CRITICAL THINKING DURING COVID-19 THROUGH ONLINE LEARNING

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Abstract: *The application of Problem Based Learning model by online learning during the Covid-19 period is one way to improve students' thinking abilities. This research aims to obtain empirical data about the comparison of student's critical thinking skills levels by using the online based Problem Based Learning (PBL) model using the Zoom application and Whatsapp Grup in class X IPS SMAN 5 Tangerang Regency. The method of this research used quantitative that is quasi-experimental design. This research's samples were class X IPS as an experimental class or class A and class X IPS 2 as a control class or class B. The researcher analyzed the data in descriptive statistic by using SPSS 25 version. The results showed that applying the Problem Based Learning model has a positive impact on improving student's critical thinking skills.*

Keywords: *Problem Based Learning (PBL); Critical Thinking; Covid-19; Daring*

Abstrak: *Penerapan model pembelajaran Problem Based Learning melalui daring pada masa covid-19 merupakan salah satu cara untuk meningkatkan kemampuan berpikir siswa. Tujuan penelitian ini untuk memperoleh data empiris tentang perbandingan tingkat berpikir kritis siswa dengan menggunakan model pembelajaran Problem Based Learning (PBL) berbasis online dengan menggunakan aplikasi Zoom dan Whatsapp Grup pada siswa kelas X IPS SMAN 5 Kabupaten Tangerang. Metode penelitian ini menggunakan kuantitatif yaitu quasi eksperimen desain. Sampel dalam penelitian ini adalah kelas X IPS 1 sebagai kelas eksperimen atau kelas A dan kelas X IPS 2 sebagai kelas control atau kelas B. Pengumpulan data dilakukan dengan tes, dokumentasi dan observasi. Peneliti menganalisis data secara statistik deskriptif dengan menggunakan SPSS 25 versi. Hasil penelitian menunjukkan bahwa penerapan model Problem Based Learning berdampak positif dalam meningkatkan kemampuan berpikir kritis siswa.*

Kata kunci: *Model Pembelajaran Berbasis Masalah; BerpikirKritis; Covid-19; Daring*

INTRODUCTION

After the pandemic hit Indonesia caused by the Corona virus, the government has done many ways to break the chain of its spread (Firman & Rahman, 2020). The COVID-19 pandemic attack has changed all habits in learning education, carried out directly or face-to-face with all its strategies, now it cannot run optimally. (Satrio et al. 2020). Changes to the school learning system are implemented online or online. (Kurniawansyah & Siswanto, 2020). The

learning process can be accessed using the internet network (Sadikin & Hamidah, 2020). The online learning methods used include webinars, use of the Zoom application, Whatsapp, Web, Youtube videos, etc (Marbun, 2020).

The ability to think critically is essential so that individuals in the future do not immediately believe in receiving information, are not easily influenced, and will always correct the truth of the information they get. (Anwar et al. 2017).

Likewise, with the learning process, students must master critical thinking to change their thinking patterns towards articles to dig up the information they get. (Dewi, 2020). Yuliati, (2013) said that critical thinking could be taught and trained so that students can analyze information in their minds to determine or make intelligent decisions.

US-based Partnership for 21st Century skills Zubaidah, (2018) The skills individuals need in the 21st century include Critical Thinking Skills, Creative Thinking Skills, Communication Skills and Collaboration Skills as essential competencies that must be mastered by individuals in the 21st century. This competency, known as 4C through UNESCO 4C consists of collaboration, critical thinking, creativity and communication which is the basis for developing student abilities. Several countries have adopted this concept to make changes and reforms to the education and learning system (Sulisworo et al. 2019).

Based on data from Partnership for 21st Century skills APEC Ed Net–Xi'an Symposium Xi'an China Kay, (2008) The skills that individuals in the 21st century must master include: (1) critical thinking (78%); (2) information technology (77%); (3) health and fitness (76%); (4) collaboration (74%); (5) innovation (74%); (6) personal financial responsibility (72%) . The results of the 2018 PISA (Program for International Student Assessment) report released by the Organization for Economic Cooperation and Development (OCED) the results of students' reading, math, and science or science abilities decreased. So that Indonesia's position is ranked 72 out of 77 countries. As a comparison, Indonesia's PISA score for the 2015-2018 period, the reading ability score fell from 397 points to 371 points, while the math ability score from 386 points to 379 and the science ability score from 403 to 396 points (Summaries, 2018). If seen from some of the data reports above, it can be concluded that Indonesian student's critical thinking skills are still low.

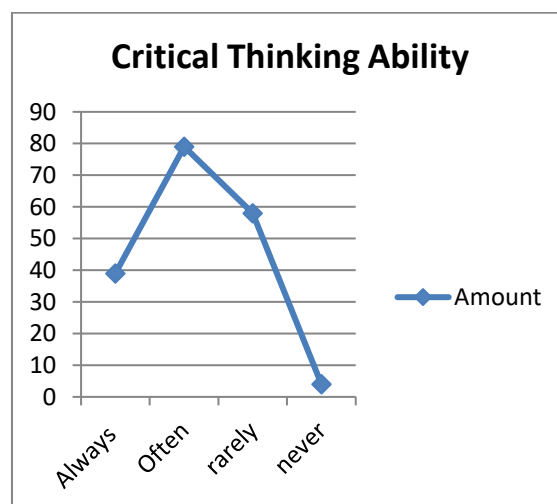


Figure 1. Pre-Research Data

Based on the results of pre-research data conducted at school by analyzing through the critical thinking indicators of Ennis's theory, namely being able to ask questions, answer questions, analyze

arguments, make conclusions, and evaluate and assessing skills. The observations used as a questionnaire to be filled in by 26 students as the sample showed that 22% always answered, 44% often answered, 32%

rarely answered , 2% answered never. So it can be concluded that the critical thinking criteria of students of SMAN 5 Tangerang Regency are in the medium category. Only a few schools implement the learning that leads to the critical thinking skills (Santrok, 2011).

This is confirmed by the opinion Anindhyta at al. (2019) which says that in reality in the field, the learning process that takes place in the class emphasizes the cognitive aspects only, so that the critical thinking process of students in receiving learning is less attention. Therefore, many students do not understand the concepts taught by the teacher. Currently, students' critical thinking skills cannot be developed optimally. It is still seen that students have not actively participated in the learning process (Santoso, 2016).

Teachers still dominate conventional learning models (Saepuloh & Suryani, 2020). Teacher-centered learning causes students' critical thinking skills to below, so it is very contrary to the 2013 curriculum, where students should play an active role in learning activities. (Candrarini at al. 2018).

They are Learning models, methods and strategies to improve vibrant, innovative, creative, practical learning atmosphere and make students happy so that learning can be maximized (Saepuloh & Rodiah, 2020). Teachers should be able to create an adapted learning model based on the applied curriculum and the conditions in class so that the learning process can foster learning situations that are varied, challenging, fun, and meaningful (Diani, 2016).

The Selection of the right learning model is a critical success factor in teaching and learning activities (Masini at al. 2019). Therefore, teachers play an essential role in the learning process in class and school (Surur & Oktavia, 2019). Inappropriate learning models cause student's Students'

low critical thinking skills. The learning model must be able to provide ample space for students to build knowledge (Manalu & Siregar, 2019). Developing critical thinking skills is a real process in learning activities and provides meaningful learning, by thinking critically will help study problems naturally so that students can make the right decisions (Tosuncuoglu, 2018).

Critical thinking must be developed by each student the can skills students understand the concept, they are sensitive to the problems that occur to understand the situation and can solve the problems they face. (Susanto, 2013). To develop students' learning skills, the teacher must be able to design a learning model that emphasizes the thinking process of students so that they can analyze and be able to solve problems; besides that, the involvement of students who play an active role must be considered in the selection of learning models (Anindhyta et al., 2019).

An active learning process that involves students can increase critical thinking skills, therefore critical thinking is one of the skills that students must master (Hidayati, 2016). Thinking activities in the learning process cannot be separated from critical and creative thinking activities. Critical thinking is an activity to train and assess something carefully, such as assessing ideas, the purpose of critical thinking to consider based decision making (Noordiyana, 2016).

Efforts that can be taken to overcome the above problems are to improve the learning model, in learning activities the teacher must apply the appropriate learning model and in learning objectives to be achieved. (Muslim at al. 2015). Teachers can build learning that can train students' critical thinking skills, choose the right learning model and create learning activities that make students develop all their potential so

that they can improve their critical thinking skills. (Nuryanti et al. 2018).

The development of a student-centered learning model will be able to build critical thinking and be able to solve a problem. One learning model that can train students' critical thinking skills is problem-based learning (Simanjuntak & Sudibjo, 2019). The PBL model is a learning model that focuses on analyzing and thinking critically of students about the problems they face. This model is based on real-life problems so that students can dig deeper for information or find a solution to solve a problem (Widayanti, 2020). The Problem Based Learning model is student-centered learning in solving a problem, the teacher is problems that exist in real life. Therefore, the application of this learning model can provide direct experience experienced by students and will be able to solve problems that will occur in everyday life (Asriningtyas et al. 2018).

According to Apriyani et al. (2017) learning involves students in solving problems, one of the high-ranking thinking skills is critical thinking skills that can be trained in problem-solving in the learning process. This is in line with the opinion Setyorini, (2011) said that the PBL learning process could improve students' critical thinking skills. The teacher will give problems, and then in groups they discuss the problems and exchange ideas in collaboration to obtain solutions.

Researchers discuss two variables, namely the Problem Based Learning learning model with online or online based and critical thinking whereas the previous researchers discussed more variables related to students' critical thinking skills. Online learning is a learning technique that utilizes technology in teaching and learning activities (Satrio et al., 2020). In practice, online learning requires a smartphone, tablet or laptop to access information on the

internet anywhere and anytime (Gikas & Grant, 2013). In this study, researchers used an online-based Problem Learning model using the Zoom and Whatsapp Group applications. Implementation of online learning approaches face to face using video conferencing applications including webinars zoom (Yulianto et al. 2020). Webinar zoom is a face-to-face conference application service where teachers and students can interact directly as if they were in person (Kusuma & Hamidah, 2020). In addition to zoom online learning can also be implemented using the whatsapp group application, which is the most widely used online message exchange service via whatsapp messenger, namely group conversations or group discussions. Its members can share information (Kurniawansyah & Siswanto, 2020).

Based on the above background, the researcher asked several questions, How is the implementation of online learning using the Problem Based Learning model? What is the level of students' critical thinking skills using the Problem Based Learning learning model? Moreover is there a significant difference in student's level of critical thinking skills with the application of the Problem Based Learning and Conventional models? The purpose of this study was to obtain empirical data about the comparison of the level of critical thinking of students using the online-based Problem Based Learning (PBL) learning model using the Zoom and Whatsapp Group application in class X IPS SMAN 5 Tangerang.

METHODS

This study uses quantitative research with the Quasi-Experimental Design research method. This study applies the Problem Based Learning learning model in class X IPS 1 as the experimental class and the conventional learning model in class X IPS 2 as the control class. The purpose of

this study was to compare the level of critical thinking skills of students with post-test results after the application of the PBL (Problem Baed Learning) learning model for three meetings. The data collection method used a test on therespondent, critical thinking skills which then the average score was taken to determine the comparison of students' critical thinking skills. This study's subjects were class X IPS at SMAN 5 Tangerang Regency which consisted of 5 classes totaling 179 students. The sample in this study amounted to 50 students. Testing the validity of the indicators of critical thinking, a total of 12 questions that meet the criteria

The validity test is only six questions, after the validity test is carried out the questions reliability test is 0.675 which means the coefficient is high.

RESULTS AND DISCUSSION

In the critical thinking ability test, researchers spread six essay questions with the following observations: This research analysis stage is through the test phase, first a descriptive description of the test results from the observation subjects. The second is the test of requirements analysis, the third analyzes themean of the variables with the independent t test. Moreover, the formulation or research analysis results are described as follows, the classification of subjects based on variables. This study focuses on 2 variables, namely the Problem Based Learning model and critical thinking and its explanations.

Table 1. Deskriptif Statistik

	N	Min	Max	Mean	Std. Deviation	Variance
Class A	25	33	94	64.4	17.744	314.833
Posstes Value	25	33	72	52.72	11.943	142.627
Different Values	25	0	55	17.92	12.172	148.16
Valid N (listwise)	25					

Data: Processed SPSS 2020

Based on the descriptive table above, it can be seen that the post-test score for class A is at a mean value of 64.40, a minimum value of 33 and a maximum value of 94 with a standard deviation of 17.744. Meanwhile, the mean value of posts in class B was 52.72, the minimum value was 33 and the maximum value was 72 with a standard deviation of 11.943.

Testing the requirements of the analysis requirements to determine whether the data is normally distributed or not, the researcher uses the Shapiro Wilk formula to test for normality. The normality test using SPSS 25 is as follows

Table 2. Normality Testing

Class	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Class A	0.102	25	.200*	0.961	25	.439
Class B	0.136	25	.200*	0.945	25	.197

Data: Processed SPSS 2020

Based on the normality test above, it can be seen that there is a Shapiro Wilktable which shows that the significant value in group A is $0.439 > 0.05$, it can be concluded that the data in class A are typically

distributed. While the normality test in class B has a significance value of $0.179 > 0.05$, so it can be concluded that the data in class B is usually distributed.

Table 3. Homogeneity Testing

	Levene Statistic	df1	df2	Sig.
Based on Mean	4.283	1	48	.044
Based on Median	4.18	1	48	.046
Based on Median and with adjusted df	4.18	1	44.2	.047

Data: Processed SPSS 2020

Based on the homogeneity test above, a significance value of $0.044 > 0.05$ is

obtained, it can be said that the data from the study population have the same variants.

Tabel 4. Independent t tes

		Equal Variances Assumed	Equal Variances Not Assumed
Levene's Test For Equality of Variances	F	4.283	
	Sig.	.044	
	T	2.730	2.730
t-test For Equality of Mean	df	48	42.042
	Sig. (2-tailed)	0.009	0.009
	Mean Difference	11.68	11.68
95% Confidence Interval of the Difference	Std. Error Difference	4.2777	4.2777
	Lower	3.0792	3.0476
	Upper	20.2808	20.3124

Tabel 4. Independent t tes

Based on the results of the t-test the comparison between class A and class B can be seen that the count is 2.730. While t table can be seen from two sides of df, namely 48 at 2.010 because $t_{count} > t_{table}$ (2.730 > 2.010) H_0 is rejected and H_a is accepted. This shows a significant difference between the critical thinking skills of students who apply the Problem Based Learning learning model and the critical thinking skills of students who apply conventional models.

Online Learning (Online) Using Problem Based Learning and Conventional Learning Models

Learning using the Problem Based Learning model which was carried out in the experimental class began with opening lessons to greet and pray, then the teacher explains the provisions when carrying out online learning through the zoom application, the teacher provides an overview and explains the steps for implementing learning by applying the Problem Based Learning model, namely as follows:

stage 1 student orientation to the problem, namely the teacher conveying learning objectives and motivating students to be involved in the problems to be observed and the teacher providing case studies of economic problems in Indonesia,

stage 2 organizes students in the learning process, namely the teacher assigns students to read and understand the problems observed,

stage 3 guides student investigations independently or in groups, namely the teacher encourages students to find and collect appropriate information or data to solve problems, students identify and investigate problems, then students compile the results of investigations to solve problems,

stage 4 develops and presents the work of the teacher explaining the draft for

making a handwritten report on paper and each group compiles and makes a teacher report giving students the opportunity to submit the results of the report and present it.

Stage 5 evaluation and reflection, namely the teacher and students reflect and evaluate in online learning using the zoom application. The learning steps described above aim to make students understand the flow of online learning activities. Furthermore, the teacher conveys the learning objectives that will be achieved by students after participating in learning activities at the ongoing meeting. The teacher gives related problems to the material being studied and motivates students to be involved in the problems to be observed. Students understand the problems that occur then the teacher forms groups of 5 students, each group must read and understand the content of the problem, the teacher encourages each student to find the information or data needed to solve the problem, carry out identification and investigation and then compile the results of the investigation to produce a solution, and the next stage the teacher gives a draft report on the results of group discussions and each group makes a report. The teacher allows students to present the discussion results via videocall whatsapp group on the specified day and time. The final stage of the teacher reflects and evaluates together after implementing online learning.

Rachmawati & Rosy, (2020) PBL learning model is a process of learning activities oriented to solving problems that exist in our lives, which aims to train students to solve problems in a logical way and train to develop students' critical thinking skills. The Problem Based Learning model, which encourages students to be active in the teaching learning process, presents real problems (Nainggolan yanti, 2020). (Fakhriyah, (2014) The problems

presented are real problems that exist in everyday life as a basis for exploring knowledge and concepts through students' critical thinking skills in solving a problem, problem-based learning activities provide opportunities for students to be able to express opinions and exchange ideas and train critical thinking processes to gain new experiences regarding understanding the content of the material (Rezkillah & Hayanto, 2020).

In the final activity, the teacher concludes the learning material, provides an attendance link that is filled in by students, the teacher closes the lesson by saying greetings. The implementation of online learning in the control class by applying the conventional learning model, the teacher opens lessons by saying greetings and prayers, explaining the provisions of online learning through the zoom application, then convey the learning objectives that will be achieved by students after participating in learning activities at the ongoing meeting, The teacher conveys the main points of the subject that will be discussed, namely the needs and means of satisfying needs, opportunity costs, and economic principles.

The teacher explains the material using power point slides that are displayed on an online zoom screen, students listen and pay attention to the material being explained. Then the teacher allow students the ask questions regarding material that has not been understood, students and teachers are involved in online discussions. Furthermore, the teacher gives several quiz questions directly which will be answered by students todetermine the extent of understanding the material. In the final activity the teacher concludes the learning material, provides an attendance link that will fill in google form the teacher closes the lesson by saying hello.

How the Level of Students' Critical Thinking Ability Using Problem Based Learning and Conventional Learning Models

The problem-based learning model applied to class X IPS 1 as an experimental class, when the implementation of online learning students become more active and responsive to what the teacher orders, This can be seen that students are more responsive in solving problems given and able to solve problems. The post-test results after the application of the problem-based learning model on the basic concepts of Economics obtained the highest score of 94 and the lowest score of 33. The student's average score was 64.4. This is because students have been able to answer the questions given and correctly and adequately.

The total number of indicators in the experimental class is 11.95. Based on the six indicators of critical thinking, in indicator 1 the student has explained the ideas related to the case study given which is relatively straightforward and precise, indicator 2 students can analyze things related to the answers are quite clear and precise, indicator 3 students can evaluate the results of the answers by explaining clear and precise reasons, indicator 4 students can filter the required information and data appropriately and produce conclusions using their language that is clear and precise, indicator 5 students can produce their thoughts and be able to solve the problems given by making clear and precise solutions, indicator 6 students can organize themselves to answer questions by correcting the results of the answers are clear and precise.

While the level of critical thinking skills in class X IPS 2 as the control class from the post-test results, the highest score was 72 and the lowest score was 33, the average value was 52.72. This is because students answering questions are not

maximal, at the time of implementation learning. The teacher plays an active role so that students only listen to the explanations silently. The understanding of the control class material is still lacking. This is because the application of conventional learning models makes students passive.

There is a significant difference in critical thinking skills that apply problem-based learning and conventional learning models

Post-test data analysis in the experimental class and control class obtained an average value of 64.4 while the average value in the control class was 52.72. The data obtained from the t-test obtained from the different values of the experimental class and the control class can be seen from the t_{count} of 2,730 while the t_{table} can be seen from two sides of df which is 48 at 2.010 because $t_{count} > t_{count}$ ($2,730 > 2,010$) then H_a is accepted and H_o is rejected. So the conclusion is that applying the problem-based learning model can improve students' critical thinking skills with the acquisition of post-test results for class A better than class B.

Bashith, (2017) study shows that problem-based learning affects students' critical thinking skills and learning outcomes, students' critical thinking abilities in the experimental class are higher than the control class. The research results are corroborated by Odabas, (2009) who said that problem-based learning can improve higher-order thinking skills, namely critical thinking. This research is also strengthened by the results of research conducted by Rezkillah & Hayanto, (2020) which shows that the application of the Problem Based Learning learning model that uses HOTS category questions can have a significant effect on students' critical thinking skills when compared to the application of conventional models.

Based on the results of research that has been carried out by several previous researchers, shows that the application of the problem-based learning model can improve critical thinking skills, the results of research conducted by researchers have the same measured variables, namely Problem Based Learning and critical thinking. As for the difference in previous research carried out before the pandemic in the world so that the learning process is carried out optimally. In the researchers carry out learning during the pandemic caused by COVID-19 so that the learning process is required to be online or online with limited teaching techniques and existing constraints such as an unstable internet network that makes learning implemented not optimally as well as the application of the learning model in groups is more difficult to manage. Rather than directly.

Learning using the zoom application becomes a new container or place for teaching and learning activities, the zoom application is also one solution to carry out online learning at school or lectures. (Fitriyani & Kamsi, 2020). The results of research conducted by Kurniawansyah & Siswanto, (2020) during the COVID-19 pandemic, online learning can be useful by using applications that can support the implementation of learning such as zoom,

WhatsApp group and Google Drive. Strengthened by the results of research conducted by Haqien & Rahman, (2020) online learning using zoom has advantages and disadvantages including the implementation of learning is less effective due to network/internet constraints, besides that zoom also has the advantage of being more practical and efficient because communication between educators and students is more accessible than communication in writing. Based on the explanation described above, the problem-based learning model can improve

students' critical thinking skills. Besides online-based learning using the zoom application and whatsapp group is also useful during the COVID-19 pandemic, this research has answered the questions raised so this research is said was successful.

CONCLUSIONS

The critical thinking level ability of students who apply the Problem Based Learning learning model in the experimental class obtained an average score of 64.4, while the lowest score is 33 and the highest score is 94. While the average value in the control class was 52.72, the lowest value was 33 and the highest value was 72. So the level of critical thinking ability of class A students is better than class B's ability level. It can be concluded that the application of the Problem Based Learning learning model can improve class X IPS SMAN 5 Tangerang Regency students. The implementation of online learning has been done well, so it needs to be maintained besides that there are still shortcomings, it needs to be repaired and improved again. Teachers are expected to use a more varied learning model according to the curriculum, K13, which requires students to play an active role during the learning process, such as the Problem Based Learning model which can improve students' critical thinking skills.

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