



TBL vs. PBL: Which is More Effective Model in Economics Learning?

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Abstract

Economics subject discusses many economic problems in students' circumstances, and it requires critical thinking ability. However, the ability of students to think critically linked to economics is still an insufficient category. Therefore, it needs to implement the learning model that affects the development of students' critical thinking. This research aims to compare the effectiveness of team-based learning (TBL) and problem-based learning (PBL) models in economics learning as an attempt to enhance students' critical thinking skills. This study adopted a quasi-experimental method using two experimental classes treated differently. The pre-test and post-test data obtained were used to estimate the research hypotheses through the ANCOVA test. The results of this study indicate differences in the improvement of critical thinking skills in TBL and PBL class students, with a significance level of 0.007 (<0.05). Students in the TBL class experienced increased critical thinking skills 10% superior to students in the PBL class. Therefore, TBL can be an alternative for teachers of economics or other relevant subjects to apply in teaching-learning activities by paying attention to the content rather than the material to be delivered. Further research regarding the TBL model with other 4Cs skills besides critical thinking is needed.

Abstrak

Mata kuliah ekonomi banyak membahas permasalahan ekonomi yang ada di lingkungan mahasiswa dan membutuhkan kemampuan berpikir kritis. Namun, kemampuan berpikir kritis mahasiswa terkait dengan ilmu ekonomi masih tergolong kategori kurang. Oleh karena itu, perlu diterapkan model pembelajaran yang berpengaruh terhadap perkembangan berpikir kritis siswa. Penelitian ini bertujuan untuk membandingkan efektivitas pembelajaran berbasis tim (TBL) dan pembelajaran berbasis masalah (PBL) dalam pembelajaran ekonomi sebagai upaya untuk menggunakan metode kuasi eksperimen dengan menggunakan dua kelas eksperimen yang diberi perlakuan berbeda. Data pre-test dan post-test yang diperoleh akan digunakan untuk menguji hipotesis penelitian melalui uji ANCOVA. Hasil penelitian ini menunjukkan bahwa terdapat perbedaan peningkatan keterampilan berpikir kritis pada siswa kelas TBL dan PBL dengan taraf signifikansi $0,007 < 0,05$. Siswa pada kelas TBL mengalami peningkatan keterampilan berpikir kritis 10% lebih unggul dibanding siswa pada kelas PBL. Oleh karena itu, TBL dapat menjadi alternatif bagi guru ekonomi atau mata pelajaran lain yang relevan untuk diterapkan dalam proses KBM dengan memperhatikan isi daripada materi yang akan disampaikan. Perlu dilakukan penelitian lebih lanjut terkait model TBL dengan keterampilan 4Cs lainnya selain critical thinking.

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INTRODUCTION

The 21st century raises individuals' competitiveness, and it needs to be responded to by having qualified skills. Three primary skills need to be considered, according to the Partnership for 21st-century learning, including career and survival skills, learning skills, and information and communication technologies and skills (Guo & Woulfin, 2016). In addition, a prior study remarked that an individual needs to have four primary skills in facing global competitiveness, known as the 4Cs: critical thinking, creativity, communication, and collaboration skills (Merenkova et al., 2021). In detail, critical thinking skills help make wise decisions, which is to the opinion of experts who say that a critical thinker will have the ability to clarify, assess, and make wisely (Ennis, 2015). A person can find reliable sources based on evidence and make a reasonable judgment or decision when they have the skills to think critically (Ku et al., 2019).

Critical thinking skills also significantly drive students' learning success (Malawi & Tristiar, 2016). The basic rationale is that some subject matter is not primary concept material but deals with complex issues. For instance, economics subjects require students to have critical thinking skills since this lesson includes issues close to students (Putri, 2018). In addition, an earlier study explained that economics subject requisites this skill to obtain a better understanding relate actual and analyze the issues listed in the questions given, which in turn can achieve great learning outcomes (Sari & Dewi, 2017). Furthermore, Critical thinking skills also need to be applied in economics teaching because economics does not only cover theoretical understanding but enables students' ability to correlate events that occur with other events (Siegfried & Colander, 2022).

However, students' critical thinking skills are still in the low category, and it has been a long debate among scholars. A prior study noted that approximately 45% of high school students belonged to the group that had low-level critical thinking skills (Benyamin et al., 2021). Indeed, in economics learning, students' ability to think critically is also being a major issue (Maiyetri & Ansofino, 2014). A preliminary scholar noted that this condition occurs caused the use of conventional teaching, which positions the teacher as the primary source of information (Lestari et al., 2019). In doing so, teachers need to improve students' critical thinking ability through effective teaching methods. Effective teaching methods should be performed so that learning activities do not seem monotonous and involve students playing an active role during learning (Ngaeni & Saefudin, 2017). One of the practical learning models to improve students' critical thinking skills is learning that can orient students in solving a given problem (Iranto & Suparno, 2014).

Previous research by Putri (2018) mentioned that students' skills in critical thinking have increased through the application of problem-based learning (PBL). Similarly, a study by Sianturi et al. (2018) also remarked that the PBL model was superior to the PjBL model in developing students' critical thinking skills in mathematics subjects. Based on some of the results of this study, it is proven that the PBL model effectively improves students' critical thinking skills. However, the involvement of students in problem-solving does not guarantee to grow of students' skills, especially in critical thinking ability. Several studies have shown a link between active learning and increasing students' critical thinking ability (Hyunsook et al., 2014; Kim et al., 2013). Another learning model, team-based learning (TBL), is often applied in economics and university-level economic learning. This model creates active learning through teamwork carried out by students with each other.

There are three learning steps proposed by the TBL model. First, in this initial step (preparation), the teacher provides teaching resources and materials to students so they are required to study material outside the classroom before learning is carried out. The second stage is readiness assurance, in which the teacher conducts a test to measure the students' readiness in the TBL process and divides students into several groups. Third, the application stage in the material presented is when students explore the material and solve a problem on the task given by the teacher (Asriyadi, 2018). However, the TBL model has not been widely applied in Indonesia. In other countries, research on the TBL model has been commonly performed and the results indicated that there was an increase in critical thinking skills through the application of this model. In this regard, it can be seen that it is known that TBL can create active learning and develop analytical skills in students' problem-solving (Rezaee et al., 2016).

In addition, the study in the United States context showed that applying the TBL model can enhance critical thinking skills in students (Espsey, 2018b). Indeed, Parmelee et al. (2012) agreed that students' critical thinking skills can develop through the TBL model learning syntax by giving students knowledge review tests. However, no studies have discussed the effectiveness of TBL in improving students' critical thinking skills compared with PBL. Considering the level of critical thinking skills of high school students who are still low and the existence of a gap in the literature regarding the effectiveness between the PBL and TBL model, this study intends to reveal whether TBL improves students' critical thinking skills in economics subjects. In addition, this study attempts to compare the effectiveness of the TBL and PBL models in enhancing senior high school students' critical thinking skills. The following section will explain a more detailed explanation of the method, results, and further discussion.

METHOD

The research adopted a quasi-experimental with a pretest-posttest nonequivalent multiple-group design (Wiersema, 1995). The research design was used to determine the effectiveness of the two learning models in improving critical thinking skills: team-based learning (TBL) and problem-based learning (PBL). The variables in the study include the independent variable, namely the learning model: TBL and PBL. Meanwhile, the dependent variable of the research is critical thinking skills. TBL in this study related to the learning model that requires students to learn independently outside the classroom and use good teamwork during learning. While, the PBL model involves orienting students to real problems and solving them by relating them to ongoing economics learning materials.

This study determines high school students in the same semesters by involving second-year students (class XI) as the research population. The sample is determined using a purposive sampling technique by taking into account the almost the same semester final assessment average score. In this research, two classes receive different treatments. Experimental class 1 was taught using the TBL model, while experimental class 2 was provided using the PBL model (see Table 1). Based on the sampling technique, two classes were selected from a total of four classes set to be experimental class 1 and experimental class 2 by considering the average value of the two classes, which was 83.2. The research sample comprised 60 students in two social science classes (XI IPS 1 and XI IPS 2) at SMA Negeri 1 Lawang in Indonesia. The research was conducted during February and March 2022.

Table 1. Experimental Research Design

E ₁	O ₁	X ₁	O ₂
E ₂	O ₁	X ₂	O ₂

Table Description

- E₁** : Experiment Class one
- E₂** : Experiment Class two
- X₁** : TBL
- X₂** : PBL
- O₁** : Pre-test
- O₂** : Post-test

Essay questions as an instrument that was applied to determine students' critical thinking skills. Before using the initial step, the validity and reliability tests were performed to ensure that questions based on critical thinking indicators. *Critical thinking* is a person's ability to see a problem logically and determine solutions. In contrast, the indicators that Ennis has developed to categorize critical thinking skills possessed by individuals are (1) primary clarification, (2) basic decision making, (3) inference, (4) further clarification, (5) supposition, and integration (Ennis, 2015). The test questions consist of seven items, and each is declared valid and reliable, as shown in Table 2.

Table 2. Critical Thinking Ability Test Questions

Indicator	Sub-indicator	Question
Basic clarification	Ask and answer questions	Pictures of imported goods circulating in Indonesia are presented. Students are asked to find out why they prefer to import these goods.
	Understand and read a table	The balance of payments table is presented. Students are asked to explain the contents and information shown in the balance of payments table.
	Analyze arguments	Presented news excerpts containing international trade policies, namely dumping. Students are asked to analyze an argument listed in the news content.
Basic decision making	Formulate possible alternatives for solving a problem	Presented the phenomenon of the K-Pop fever that hit Indonesia. Students are asked to analyze the impact of these phenomena and provide options to overcome these problems related to international trade policy.
Inference	Make logical conclusions based on the facts.	Presented news snippets contain international trade policies, namely dumping. Students are asked to make conclusions based on the facts presented in the news snippet.
Further clarification	Defining a term and considering a definition	A statement relating to the country's foreign exchange is presented. Through this statement, students are asked to define the term foreign exchange.
Supposition and integration	Define an action	A table of commodity outputs for two countries is presented. Through this output, it is known that the two countries will conduct international trade. Students are asked to determine the appropriate export and import actions taken by the two countries so that they both benefit. The calculation of DTDN strengthens students' answers.

Source: modified from Ennis (2015)

The results of the validity and reliability are presented in Tables 3 and 4. From the tables, it can be stated that the critical thinking skills test questions on each item are declared valid and reliable. In other words, the test questions can be used to measure students' critical thinking skills in the experimental class through test activities carried out before and after being given different treatment. The results of these tests become data used for hypothesis testing. As for the hypothesis in this study, namely:

H₁: The PBL model effectively improves students' critical thinking skills.

H₂: The TBL model is effective in increasing students' critical thinking skills

H₃: There are differences in improving students' critical thinking skills through applying TBL and PBL models by controlling students' initial skills.

Table 3. Validity of questions

Question	r-count	Conclusion
r-table (5%) : 0.361		
Question 1(a).	0.416	Valid
Question 1(b).	0.562	Valid
Question 2(a).	0.405	Valid
Question 2(b).	0.444	Valid
Question 3.	0.485	Valid
Question 4.	0.409	Valid
Question 5.	0.533	Valid

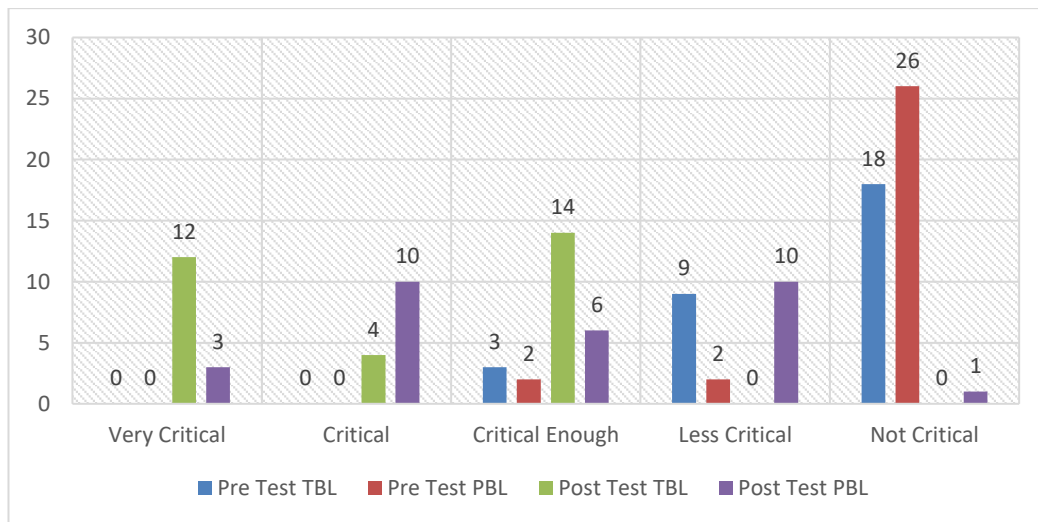
Table 4. Reliability Test Questions

Cronbach's Alpha	Number of questions	Conclusion
r-table (5%) : 0.361		
0.383	7	reliable

Before entering the hypothesis testing stage, the data must first be declared normal and homogeneous by conducting assisted testing using SPSS 26 for windows. Normality test was performed using the Kolmogorov-Smirnov test. After fulfilling these requirements, proceed to analyze the data through the ANCOVA test to see whether or not there is a difference in the improvement of students' ability to think critically after controlling for students' initial skills based on the treatment that has been performed, as well as seeing the effectiveness between the TBL and PBL models.

RESULTS AND DISCUSSION

There are two types of results in this study, namely qualitative data in the form of test scores from the two experimental classes and quantitative with the ANCOVA test to determine the effectiveness of the models. The treatment was carried out in the practical class by controlling for covariate variables, namely students' initial abilities obtained through pre-test and improvement of students' critical thinking skills scores. However, before carrying out the ANCOVA test, the data must undergo a pre-requisite test to accomplish all ANCOVA requirements. The test includes the residual normality test, variance homogeneity test, correlation linearity of covariate-dependent variables, and regression coefficient homogeneity.



Source: modified from Wayan and Sunartana (1986)

Figure 1. Critical Thinking Skills Level of Experiment Class Students

Figure 1 illustrates the level of critical thinking skills before being given treatment. Most students belonged to the uncritical category, with as many as 18 students in the TBL class and 26 others in the PBL class. Nine and ten students in the PBL class have the initial critical thinking ability, which is classified as less critical, and there are only five pretty critical students. In detail, three students were in the TBL class and two in the PBL class. Figure 1 shows increased students' critical thinking skills after receiving treatment. In the TBL class (experiment 1), it can be seen that 12 students have increased critical thinking skills, which are classified as very critical, four students are classified as critical, and 14 students are categorized as critical enough. In contrast to the TBL class (experiment 1), in the experimental class, it was found that there was one student who was still classified as uncritical, ten students classified as less critical, six students in the moderately critical category, ten students classified as critical, and only three students in the very critical category.

Table 5. Residual Normality Results

	Kolmogorov-Smirnov ^a			Alpha	Conclusion
	Statistic	df	Sig.(p)		
Residual for Post_Test	.092	60	.200*	0.05	Normal

In Table 5, it can be seen that the Kolmogorov-Smirnov test results have a Sig value. (0.200) > α (5%), which means that H₀ is accepted or in other words, the residual data of students' critical thinking skills in both classes are normally distributed, and the assumption of normality is accomplished.

Table 6. Results of Homogeneity of Variance

Dependent Variable: Post_Test					
F	df1	df2	Sig.(p)	Alpha	Conclusion
1.601	1	58	.211	0.05	Homogenous

The next pre-requisite listed in Table 6 is the homogeneity of variance test using the results of Levene's Test of Equality test, showing the data variance of students' critical thinking skills; both experimental class 1 and experimental class 2 are homogeneous. This can be seen through the number of Sig. (0.211) > (0.05), then H₀ is accepted, and the homogeneity assumption is met.

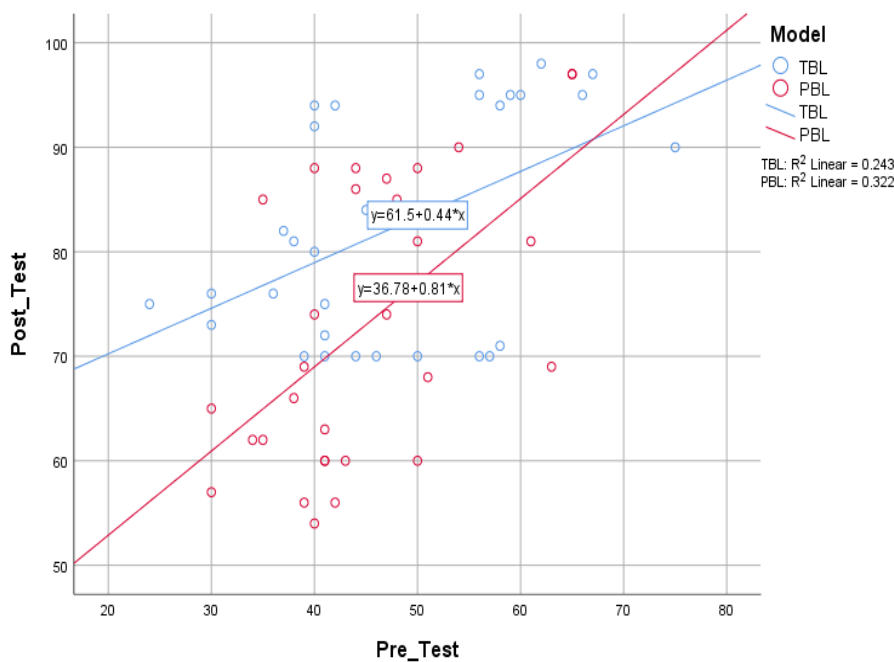


Figure 2. Linearity Graph of the Correlation of Covariates Dependent

Based on Figure 2, it can be seen that the scatterplot shows a linear trend. It can be concluded that between the covariate variables (students' initial critical thinking ability) and the dependent variable (critical thinking ability after being treated differently), both experimental class 1 and experimental class 2 have a linear relationship.

The results of the regression homogeneity test in table 7 show the slope of the regression of the pre-test data with the final test data of students' critical thinking skills between experimental class 1 and experimental class 2 are homogeneous with a Sig value. (0.161) > α (0.05).

Table 7. Regression Coefficient Homogeneity

Tests of Between-Subjects Effects						
Dependent Variable: Post_Test (Students' Critical Thinking Skills)						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	3875.872 ^a	3	1291.957	11.662	.000	
Intercept	7139.566	1	7139.566	64.447	.000	
Model	451.990	1	451.990	4.080	.048	
Pre_Test	2536.578	1	2536.578	22.897	.000	
Model * Pre_Test	223.799	1	223.799	2.020	.161	
Error	6203.778	56	110.782			
Total	371851.000	60				
Corrected Total	10079.650	59				

Table 8. ANCOVA Test Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	3652.074 ^a	2	1826.037	16.193	.000	
Intercept	8106.323	1	8106.323	71.887	.000	
Pre_Test	2317.257	1	2317.257	20.550	.000	
Model	889.649	1	889.649	7.889	.007	
Error	6427.576	57	112.764			
Total	371851.000	60				
Corrected Total	10079.650	59				

The results of the ANCOVA test in Table 8 show that the experimental class 1 and experimental class 2 have different critical thinking skills after controlling for the student's initial ability test (F-count = 7.889, with a significance level of 0.007 < 0.05) which means that H₃ is accepted. Table 8 also shows the effect of the applied learning model (TBL and PBL) on students' critical thinking skills (F-count = 16,193, with a significance level of 0.000 < 0.05). Based on these results, H₁ and H₂ are accepted.

Table 9. Improving Students' Critical Thinking Skills

Learning model	Pretest		Posttest		Difference	Enhancement	Corrected Average
	M	SD	M	SD			
PBL	44.90	9.503	72.93	13.496	28.03	62%	73.765
TBL	47.80	12.352	82.37	10.928	34.57	72%	81.535

Table 9 shows that both the PBL and TBL models effectively improve students' critical thinking skills, with each increasing percentage of 72% in Team-Based Learning and 62% in Problem-Based Learning. Based on these results, it can be concluded that the increase in students' critical thinking skills was more significant in the class treated using TBL than the class with the application of the PBL model seen from the number of increases and the average corrected in the two experimental classes.

Based on research conducted on two practical classes with the same average of odd semester final assessment, each class has 30 students. The distribution of gender in the two experimental classes, namely the first experimental class, consisted of 11 students and 19 students. At the same time, the second experimental class also consisted of 30 students with a gender distribution of 10 students and 20 students. The material used in this research is international trade material. Learning activities at SMA Negeri 1 Lawang lasted 50 minutes, with three meetings held online and offline. When online, learning activities are supported by *Zoom, Google-meet, Padlet, WhatsApp, and Youtube*. The first meeting was held in the first experimental class with the application of the TBL model, knowing students' initial skills in critical thinking through tests conducted before giving treatment and providing teaching materials needed by students to support learning at the next meeting.

The second learning is provided online using zoom, and the teacher does IRAT and TRAT using the same questions to see students' readiness to learn. After that, it is necessary to strengthen the material for the teacher to explain the material that students still need to master. Discussion activities are performed online using the breakout room feature. The third meeting was offline with the same learning syntax as the previous lesson but with a different case study. Research that has been conducted found that students' critical thinking skills have increased after receiving treatment in the application of the TBL learning model; this follows the results of the research in Figure 1 and Table 9. Through the learning syntax in the TBL model, students' ability to think critically can grow during learning. The first syntax is preparation, and at this stage, critical thinking skills can be grown through independent learning by studying sources and references to learning material provided by the teacher before learning takes place and trying to review the material they will receive at the next meeting.

The first stage can encourage students to be actively involved and require them to find concepts and understandings independently (Yuretich & Kanner, 2018). The following syntax is readiness assurance diagnosis-feedback. At this stage, the teacher performs IRAT and TRAT; these activities can develop critical thinking skills in students through discussion and arguing about answers and their understanding of the material with their respective teams to determine the most appropriate answer (Silberman et al., 2021). Furthermore, in the application of course syntax, at this stage, students will discuss with their respective teams to find answers to questions related to the problems in the news and relate these problems to learning materials. This stage helps students practice formulating problems and then conduct discussions with their respective teams to determine alternative problem-solving through existing learning sources so that critical thinking skills in each individual can develop more (Nursulistyo et al., 2021).

The findings indicate that the lowest score in the experimental class 1 after the TBL model was applied by 70, with an increase in critical thinking skills of 72%. Therefore, applying the TBL model in economics effectively improves students' ability to think critically. The results of the research that has been carried out have found the same results as a survey on students in the United States, in which, through the development of material concepts independently, feedback between students during the discussion process can foster critical thinking skills in students (Espey, 2018b). A prior study also states that there is an effect of the TBL model on students' critical thinking skills (Nursulistyo et al., 2021). The ability of students to think critically and the experience of teamwork gained during learning using the TBL model can support students to be better prepared for their careers after graduation.

Meanwhile, the learning activities carried out in the second experimental class that applied the PBL model were at the first meeting taken offline. The teacher conducted a pre-test at the first meeting. Furthermore, the next activity is to orient students to the problem and guide group discussions. The second meeting of students, divided into several groups, discussed and presented the results of the discussion online through google-meet. In the third meeting, learning takes place online via zoom. Learning activities are carried out under PBL syntax supported by Padlets and a breakout room feature that can facilitate students conducting group discussions and make it easier for teachers to supervise the discussion.

Based on the group discussion sheet in the PBL class, it can be seen that the answers they wrote still needed to be more accurate, too broad, and outside the scope of the material being studied. This happens because, in practice, students look for sources of information independently, so in this case, students still need to understand the core of the problems discussed. The lack of students' understanding of the concepts of the material discussed and the relevance of the problems given to the material being discussed indicates that the group discussions they write beyond the topics discussed. Thus, it is different from the TBL class, where students are first prepared to read and study teaching materials that can help them understand more about the concept of the material so that the answers written are more precise and by the topic of the material being studied. Based on the findings shown in Figure 1 and Table 9, it is known that students' critical thinking skills also increased by 62% in the class treated by applying the PBL model.

This is in line with previous research, which found that PBL can develop students' critical thinking skills through discussion activities and looking for alternatives to solve problems (Satwika

et al., 2018). However, there is a significant difference between students' skills in critical thinking after controlling their initial abilities. It can be seen through the results of hypothesis testing using the ANCOVA test. Through the ANCOVA test, by entering the value of the initial test and post-test after being given treatment in both practical classes, it can be seen that the corrected mean, which is the new average after controlling for covariate variables, and the corrected mean are the TBL class is superior to the PBL class. The student's initial ability test shown in Figure 1 shows that students' critical thinking skills in practical classes one and two are still classified as uncritical (Sari & Dewi, 2017).

The highest score for the pre-test was one and two students. While the post-test results given to the two experimental classes showed an increase in students' critical thinking skills in experimental class one and experimental class two based on percentage calculations, the TBL class had a higher percentage increase. The highest average post-test scores were obtained by male students, namely five students in the TBL class and three students in the PBL class. In contrast to previous studies, which stated that female students had higher critical thinking skills than boys, this study found that male students dominated had higher critical thinking skills than women (Azizzah et al., 2021). The differences can be caused because men can write more effectively and efficiently in solving a problem. At the same time, women tend to be long-winded and are still weak in including functional elements in solving problems. Hence, women tend to include all elements without paying attention to whether or not these elements help solve problems (Setyawati et al., 2020).

In the test results before and after the treatment in the TBL class, the lowest post-test score was 70, while in the experimental class 2, the lowest score was 54. These findings support previous research on the effect of active learning on improving students' critical thinking skills even though the critical thinking level has not yet reached the very critical stage (Kim et al., 2013). Students' critical thinking skills are helpful in individual abilities to solve a problem and find the right solution in implementing the material on a real problem (Espey, 2018b). Based on hypothesis testing using the ANCOVA test, it can be concluded that there are differences in students' critical thinking skills who are treated with TBL and PBL learning models after controlling for students' initial abilities. The differences occur because the TBL syntax can foster critical thinking skills in students through learning activities and reading material before class starts, individual tests, group discussions, and implementation of material on daily problems.

Through the readiness assurance diagnosis-feedback syntax, students will first work on the questions individually and then discuss the questions with their respective groups. At this stage, they are faced with choices and practice to defend their answers or receive the most appropriate answers from other group members, in line with previous research that the TBL syntax of individual abilities in critical thinking can be developed through team discussions to be able to accept or reject the opinions of others regarding problem-solving (Imazeki, 2015). In addition, these findings support previous research related to the effect of the application of active learning on improving students' critical thinking skills even though the critical thinking level has not yet reached the very critical stage (Siegfried & Colander, 2022).

Both TBL and PBL learning models orient students to solve problems. In other words, these two models can potentially improve students' ability to think critically (Nursulistyo et al., 2021). However, in contrast to PBL, the teacher first sends teaching resources and materials to students before class starts in the TBL learning model. Students are required to study the material provided by the previous teacher. When learning in class, each student has done an independent study and has an overview of the topics that will be discussed during the learning process. This is supported by the results of previous research, which also found that the first syntax in TBL, namely the provision of teaching before RAT was able to help students to explore and reflect on all the information they received for a more extended period of time before class started (Yuretich & Kanner, 2018). Students' readiness to learn can be known through a teacher's quiz before learning.

The average quiz score in experimental class 1 is above the minimum criteria, which means students have done independent learning. The existence of quizzes at each meeting helps teachers determine the extent to which students understand the material and makes it easier to analyze material that students have not understood (Abdelaziz & Al Zehmi, 2020). In the PBL class, the

teacher delivers introductory material to orient students to a problem; in other words, the potential for independent learning and reading material depends on each individual. Thus, based on the quiz results given in the PBL class, there are still students who still need to score at least the predetermined criteria. The first TBL syntax, namely the preparation class, requires students to do independent learning before the class. In this first stage, the teacher provides teaching materials in the form of modules, videos, and PowerPoint, including learning materials to be carried out.

TBL helps students learn independently before learning begins and develop thinking skills through reading material activities (Mahanal & Zubaidah, 2017). Improving students' critical thinking skills can be honed through TBL learning activities, including independent learning activities and individual and team quizzes (Thalib et al., 2017). The TBL model is a model that is structured to create active and collaborative learning. Each syntax in the TBL model requires each individual to be actively involved during learning through group discussions (Parmelee et al., 2012). This aligns with implementing the latest curriculum, which requires students to be more active and the teacher only as a facilitator during learning. In contrast to other group collaborations, in the TBL model, each individual has made his own choice of answers and then discusses their answers with their respective groups to minimize individuals who are less likely to contribute to their group.

In addition, discussion activities can also help students exchange ideas on what they have learned with their friends in a group. The results of this study indicate that the average critical thinking ability of each individual in the experimental class 1 with the TBL model has a significantly higher score than the experimental class 2, which uses the PBL model; this finding also supports previous research related to active and collaborative learning. Hypothesis test results with ANCOVA show that Team-Based Learning and Problem Based Learning influence students' critical thinking skills with a significance of $0.000 < 0.05$. However, based on Table 8 of the ANCOVA test, it is known that there is a difference between the TBL class and the PBL class in improving students' critical thinking skills after controlling for students' initial abilities with a significance level of $0.007 (< 0.05)$. Table 9 also shows that TBL is significantly superior in improving students' critical thinking skills compared to the PBL model.

In the TBL learning step, the teacher requires students to have the material to be taught before the class takes place. During group discussions, each individual's critical thinking skills can be further developed (Espey, 2018a). While in the PBL class, students do not have to have initial provisions to solve the problems presented in learning activities. Therefore, both models require students to discuss and solve problems, the fact is that TBL is more effective in improving students' critical thinking skills than classes that use the PBL model in economics lessons. These findings can answer the literature gap, which assumes that students' involvement in problem-solving does not guarantee an increase in students' critical thinking skills. Other studies link active learning to improving students' critical thinking skills (Hyunsook et al., 2014; Kim et al., 2013). TBL is more effective because it pays attention to the initial provisions that students must have so that the increase is more evenly distributed among each individual. In addition, the TBL model is also suitable when combined with prototype learning methods and can be an alternative learning model that teachers in economics lessons can apply.

CONCLUSIONS AND SUGGESTION

The development of critical thinking skills possessed by students can grow through the learning model used by the teacher. Applying both online and offline team-based learning (TBL) and problem-based (PBL) can improve students' critical thinking skills in economics. The TBL model has superior effectiveness to the PBL class in developing and improving students' critical thinking ability. Based on the average level of students' critical thinking skills in the two experimental classes, the TBL class is superior in improving students' skills, especially in critical thinking, compared to the PBL class. The limitations of this study are that the application of the TBL model is only used in economic material, which includes the application of complex material with problem-solving in the real world

In other words, the TBL model effectively supports learning with subject matter that requires problem-solving, so this model cannot be generalized to apply to all other subjects. In the future, it

is necessary to conduct further research that discusses the development of the TBL model when used in other subjects or the application of this model to the subject matter that includes fundamental concepts. The TBL model can be an alternative to be applied in economics learning. Then, schools that apply the prototype method in teaching and learning activities can modify the method with the TBL model to add variations to the learning model that can be applied. Further research needs to be done regarding the effectiveness of the TBL model on other students' 4C skills, considering that this study only focuses on one skill, including critical thinking skills.

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