THE EFFECT OF PROBLEM-BASED LEARNING MODEL TOWARDS STUDENTS' COMPREHENSION OF THE ENGLISH READING TEXT

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Abstract: This research entitles The Effect of Problem-Based Learning Model (PBL) on the Students' comprehension of the English Reading Text. It is aimed at finding out the differences in students' comprehension of English reading text using the PBL and the TBL models. The methodology used was an experimental method in which there were two groups available. The first group was an experimental group that was treated using the PBL model and the second group was a control group that was treated using the TBL model. The learning models were applied to find out the one which had the greatest effect on the students' achievement in English reading comprehension. Since the subject delivered was Reading IV, the sampling technique used was purposive sampling, the sample chosen was students of semester IV, English Department of State Polytechnics of Sriwijaya. Based on the result of two-way analysis of variance or ANOVA AB on the level of significance of $\alpha = 0,05$, it is found that $F_{hitung} = 4,555$ dan $F_{tabel\ (0,05;1:40)} = 4,08$. Based on the value of Significance on the table of *Tests of Between-Subjects Effects* on line A that if it is less than 0.05, the result of the test is significant. In the table of 4.12, the Sig value for line A was 0.039, less than 0.05. Then it is concluded that students treated using the PBL model were far higher in English reading text comprehension compared to those who were treated using the TBL model.
Keywords: *students' comprehension; English reading texts; PBL model; TBL model.*

INTRODUCTION

The objective of reading is related to reading comprehension. Comprehension is related to knowledge gained after reading in order that readers are able to relate new things after reading the problems. This research is aimed at finding out the differences in students' comprehension of English reading text using the PBL and the TBL models.

This research recommends the revision of Taxonomy Bloom as a way of determining the standard of level in comprehension. They are remembering, understanding, applying, analyzing, evaluating, and creating which the first three levels refer to low critical thinking and the other three belong to high critical thinking. It means that when we are teaching Reading, it is recommended to have any strategies or models which are appropriate to use in order to gain better or maximum achievement. Supriyadi, Mayuni, & Lustyantie (2019) in their paper found that the language learning model gives positive effects on the students' comprehension.

There have been so many strategies or models offered and applied but so far experiments are always done to fit what Reading Comprehension with what model is best to use. One of them is by Singh (2019) who wanted to find the effectiveness of implementing a metacognitive strategy training approach in second language Reading instruction to a Japanese female participant. The result was that there was a significant improvement in scores of Reading Comprehension so he concluded that

comprehension in reading can be gained through a metacognitive strategy training approach.

Macadangdang (2019) then recommended in the finding of her research that problem-solving (as one of the characteristics of a problem-based model) was successful in increasing students' skills of identifying important details, writing summary, analyzing and making interpretation on the text. It indicates that the students' Reading Comprehension was higly developed.

PBL recommends some skills: 1. Critical thinking, 2. The wise use of appropriate learning reseources, 3. Small group work collaboration, 4. Demonstration of communication skill verbally and in written, 5. Use of Knowledge and intellectual capability. Then, Arends (2012) acknowledged that PBL leads students to do problem solving, use high critical thinking and develop self confidence. For that, Aliyu, Fung, Rashid, & Nimehchisalem (2020) described in their findings that PBL was successfully led the students to critisely locate the opinions based on the discussion topic through the group interactions.

Arjuna & Jufri (2016), any way, made research about the teaching of Reading Comprehension using PBL model. They wanted to increase the students' skill in Reading Comprehension using PBL. Their research fostered the same steps in PBL model with the current researcher but they did not compare it with the other model. Single model they used recommended that PBL was effective for teaching Reading Comprehension. Any way, they did not try to prove if PBL is more suggested to use compared to the other model. The researcher of this research tries to prove the more effective model to use in teaching Reading Comprehension between PBL and TBL.

TBL has a purpose to strengthen the language acquisition to communicate, do some activities with the activity as the focus. In terms of characteristics, Willis in Rudd (2019) said that the concept of English language teaching using TBLT could promote the use of language in students' interaction and active participation. TBL negates language meaning and communication competency (Chen, 2018). Some researchers, through their researches, also recommend TBL as the model in teaching Reading Comprehension. One of them is the research done by Gavel (2021). He used task-based in her research and teaching university students in the combination of using authentic materials in Uzbekistan. It was proved that the activities made the students active and increased their critical thinking abilities. The class of reading comprehension became more effective.

Ahmed & Lenchuk (2020), then, study to prove that TBL was effective to teach EFL by using Action research as the methodology. After some discussions and observasions, it was found that it was effective to increase students' motivation and interest to actively involved in the teaching and learning process.

Critical thinking has a very strong influence to Reading Comprehension. Fernando & Bandara, (2020) recommended that in reviewing the literature of researches, critical thinking can be best promoted through the process of reading. Then Ardhian, Ummah, Anafiah, & Rachmadtullah (2020) then stated that learning and understanding the very detail problem in a text needed reading comprehension. It shows that critical thinking skill like deductive and inductive reasonings, analysis, evaluation, and inference closely relate to skills needed in reading process. Further, Facione (2020) mentioned the 6 characteristics of critical thinking. They are interpretation, analysis, evaluation, inference, explanation, and self-regulated. In the form of the research, Fatmawati, Zubaidah, Mahanal, & Sutopo (2019) concluded in their article that critical thinking skills contributed much in learning outcomes that the teaching was very successful.

In this research, any way, the researcher tries to search whether or not the two models have any interaction to each other with critical thinking. Consequently, this research tries to answer the research questions or hypothesis as follow: (1) English reading text comprehension of students treated with PBL is higher than those who were treated using TBL. (2) There are some interactions among PBL, TBL, critical thinking towards the comprehension of English Reading text. (3) In the class of student with high critical thinking, the students' comprehension of English reading text of PBL students is higher than those who were treated using TBL. (4) In the class of student with low critical thinking, the students' comprehension of English reading text of PBL students is lower than those who were treated using TBL.

There have been many researches dealing with the similar one done by the researcher. The followings are the state of the arts that could be presented.

In the context of the TBL in Asia schools, Ji (2017) applied the model started elementary scools until universities. The variety of languages used and the big numbers of participants in each class (about 50 students) became problems along the application process of TBL model. The management improvement made TBL model contributed much in the great success of the application. It was concluded that TBL model was very effectively used in all levels in Asia. In terms of TBL model done by the researher, The TBL model is purposely used in teaching reading comprehension and measured to test how effective it is compared to PBL model.

In his study, Lin (2017) proposed to examine the effect of PBL on the students who studied English reading comprehension through web-based English and their perceptions of PBL. The experiment was done to class using PBL strategy and to class using traditional strategy. Students in the PBL class was directed by the problem and surveyed the Internet to identify solutions. Then, students in the traditional class were taught using the teacher lecture method. Pre- and posttests, an instructional questionnaire, and self-reports were assigned to students in the two classes. The results showed that the PBL class was much more effective than the traditional class since the students in that class got much better mean scores than the the traditional one in English Reading Comprehension. Besides, the questionnaire results showed that PBL helped students increase their active learning and synthesized their cognitive processing. It was concluded that PBL strategy for Reading Comprehension through web-based English was more effective than the traditional strategy. In researher's study, the experiment compared the effectiveness of PBL and TBL, not the traditional strategy.

Adiantika & Purnomo (2018) wanted to know whether TBL was effective and applicable in the subject of Speaking in Senior High school in Kuningan. Questionnaires and interviews were carried out in this qualitative study and there were several results found. 1. TBL provided some advantages for making students active in the process of teaching and learning and 2. TBL was successfully developing students' abilities. On the other hand, there were also some difficulties using the TBL model when there were differences in time allocation, teachers' and students' proficiency at the English level. The difference with the researcer's issue, the research also discusses PBL model to prove which one is more effective to use in reading comprehension lesson.

Aker, Herrera, & Daniel (2018) believed that problem-based learning and service leaning (PBSL) should be combined to provide instructional strategies to guide ELs to academic success in order to activate the skills identified by the Partnership for 21st Century Skills. Reflecting a student-centered approach, we incorporate practice into the research process by illustrating a successful integration of PBSL into an ESOL learning environment in higher education and then highlight additional curricular opportunities for synthesizing PBSL at the elementary, middle, and high school levels. Aker, in his research, promoted Problem-based and service learning to develop students' skills in EFL but did not clarify the certain subject skill to improve like listening, reading, speaking, or writing.

Azis (2018) specifically applied the TBL model at the high school level for Speaking subjects using a quasi-experimental method. After comparing the results of the pre-test and post-test, it was found that the experimental group using TBL achieved better results than the traditional model. Students are more confident and can speak English m ore clearly in public. This meant that TBL model is more effective. Compared to the researcher's discussion the TBL is not compared to traditional model, but PBL one. Besides, contrary to the researher who uses reading subject in his experiment, Azis did the experiment in Speaking subject.

The next research was done by Hartman, Renguette, & Seig (2018), they tried to develop a program they called teacher-mentor by using PBL in their research in order to educate teachers to use PBL effectively in the classroom and to help teachers improve their own knowledge of PBL in United States classroom context. In their program, they used PBL to help teachers learn more about literacy and PBL. Literacy learning for all students improves in classroom settings that take a cooperative, student-centered approach and they belived that PBL makes students involved in active learning and leads students do multiple learning styles through a variety of collaborative tasks. The

results showed that PBL has become an effective method in terms of students' self-directed problem-solvers. PBL also showed that the teacher could apply reflections, discussions, presentations, and self-evaluations in their classrooms while enhancing students' collaboration. Different from the issue fostered by this researcher to concentrate to the improvement of students' capability in Reading comprehension, Hartman focused to improve teachers' competences in using PBL for their students.

The next research was done by Amini, Mahmoudi Largani, & Hedayat (2019). she found that TBL model was suitable to be applied in the middle schools and colleges. This survey research by distributing questionnaires to 117 high schools and colleges recommended that all teachers support the TBL model to be used since the results of the learning process were very satisfying. Different from the researcher who uses experimental method, Amini, any way, used survey method in the research.

Fatmawati et al. (2019), in her study tried to find the correlation between critical and creative thinking skills, critical thinking skills and learning achievement, creative thinking skills and learning achievement, and critical thinking, creative thinking, and learning achievement. The sample was 30 fourth-semester students from the Department of Biology Education of IKIP Mataram, Indonesia. The instrument used were 19 essay questions on photosynthesis and the critical thinking instrument which was composed of five aspects. The result showed that there were correlations among (1) critical and creative thinking skills; (2) critical thinking skills and learning achievement; (3) creative thinking skills and learning achievement; (4) creative thinking, critical thinking, and learning achievement. Since critical and creative thinking skills affect learning achievement, the empowerment of these skills may lead to the enhancement of learning achievement.

Syahfutra & Niah (2019) did the research entitled "Improving Students' Reading Comprehension by Using Problem-based Learning Strategy". The experiment was conducted at Sekolah Menengah Pertama Darma Yudha and it proved that PBL provides strategies for expressing ideas in real-life contexts. This model enhances critical thinking and problem-solving skills. It also develops flexible knowledge, effective collaboration skills and life-wide learning. PBL also helps students improve their reading comprehension and motivation. Any way, they did not prove that this model gave more contribution in student's improvement in reading comprehension compared to the other model like TBL.

Then, Supriyadi et al. (2019) carried out a research entitled "The effects of learning model and cognitive style on students' English listening skills". The purpose of this study was to determine whether there was an effect of the learning model and cognitive style on students' English listening skills. After going through an experimental study using two-way ANOVA, it was found that students who were taught using the integrative learning model had better results than students who were taught using the experiential learning model. This study also proves that there is an interaction effect between learning models and cognitive styles with students' listening abilities. Supriyadi's research also employs learning model but not TBL and PBL. He, then, did the experiment in listening subjecct, not in reading comprehension.

The next research is entitled "Improving the Critical Thinking Skills of Secondary School Students using Problem-Based Learning" by Lapuz & Fulgencio (2020). This study wants to ensure that the use of PBL can improve the critical thinking skills of economic high school students. This research is the experiment research using purposive sampling, namely 27 students from high school in Zambales, the Philippines in the 2017-2018 school year. The results prove that there are significant differences in test scores before and after treatment. In conclusion, PBL is effective in improving students' critical thinking skills based on the results of the analysis of the mean, standard deviation and t-test. Lapuz's experimental research did the analysis using t-test, not ANOVA and did not classify in low and high levels of critical thinking.

Then, Hasyim (2021), explored reading proficiency for prospective Arabic teachers or practitioners beside core competencies from the field of study they are studying. This study aimed at examining the effectiveness of the implementation of a student-centred learning method in the form of a problem-based learning method with seven-jumps (seven-steps) approach in increasing the reading proficiency in Arabic. There were 50 people of Muthala'ah Mukatsafah class as sample of the

research. The data analysis was performed through a significance test before and after treatment. The results show that there were differences in the subjects' advanced reading proficiency level as well as an increase in empathy soft skill before and after the implementation of the learning method. The research done by Hasyim was in Arabic but the researcher in this experiment uses English with the application of PBL and TBL.

The next research done by Magaji (2021). The research question to be answered was what skills can science teachers promote and encourage among students through designing and implementing problem-based learning in their classrooms? The instrument used in his research were lesson observations, interviews, and focus groups. There were 52 students of second year of secondary education, aged 13 years old in England as sample of the research who used a theoretical framework of the 3C3R model (3C- content, context, and connection, and 3R- researching, reasoning, and reflecting) in problem-based learning (PBL). The result of the study showed that the application of prior knowledge, collaborative learning, modeling and eliciting feedback were the skills promoted by PBL especially problem solving. Besides, collaborative learning was also dominant. Magaji did the research by using single model in secondary school. That was PBL. On the contrary, the researcher in this research paper uses PBL and TBL in college,

Ulla & Perales (2021) conducted experimental research with TBL using group work to improve speaking skills in English. The experiment was conducted on 106 early-year Thai university students. The subject taught is speaking with the work group method using Task-Based for 12 weeks. Using additional data through surveys, Questionnaires, and speaking performance scores in the classroom, it was found that although this group work method was new to students, they gave a good attitude. The students believe that the performance of assignments in class and activities in groups can improve and develop their English skills when they work collaboratively with classmates. This TBL experiment was done in Speaking subject, not reading comprehension and it was not compared to PBL in order to find the more effective model between them.

Nasim, Ghani, Kausar, & Khatoon (2022) tried to know effectiveness of PBL in developing knowledge of under graduate nursing students. They, then, conducted a pretest–posttest experimental design among B.Sc. Nursing students of Saida Waheed FMH College of Nursing Lahore. To determine the sample of the experiment, they used random sampling in Lottery method and put them in experimental and control groups on the topic of Diabetes Mellitus. Data were collected using MCQs-based questionnaire during pre-test-post-test processes. After doing the analysis of the data, it was concluded that PBL method has significantly improved more knowledge of the students of experimental group than the control group using traditional method. PBL is more effective teaching method in developing knowledge of nursing students than the traditional one. Contrary to the research done by Nasim and friends, The research done in this dissertation use PBL for experimental group and TBL for control group to the develop students' reading comprehension.

The above articles describe how PBL and TBL separately effective in students' competency in English (not only in reading comprehension). The gap shown was determining the best model to be used in teaching reading comprehension. Therefore, the novelty of this research paper is experimentally proof the effectiveness between PBL and TBL in teaching reading comprehension and shows which model is more affective to use than other (PBL or TBL). Besides, this research proposes to see whether or not there is an interaction between the model used and critical thinking on the increase of students' reading comprehension.

METHOD

This is an experimental study in English Department of Politeknik Negeri Sriwijaya Palembang, Indonesia and designed as treatment by level 2x 2. This study applied two sample groups, experiment and control. The experimental group used the strategy or model of Problem-based Learning (PBL). On the other side, the control group used Task-based Learning (TBL). This research took 44 samples from the total of 83 students. They were taken from all fourth semester students of English Department. Since the requirement to follow this subject is passing Reading III, the sample technique chosen is Purpossive sampling. It is the design that the researcher provides to get the best information for the purpose of his study (Etikan & Bala, 2017).

The next step was determining two classes into experimental and control groups. The two groups were then divided into: (1) Experimental group consisted of 11 high critical students. (2) Experimental group consisted of 11 low critical students. (3) Control group consisted of 11 high critical students. (4) Control group consisted of 11 low critical students.

Before doing the experiment to the two groups, the researcher, as the first phase, conducted pre-test in order to know the initial ability of the object of research in comprehending the English reading text. This pre-test also helped the researcher in considering putting the students in their category of critical thinking in each group both in experimental and control groups. Then, he continued writing syllabus, peparing the models for the two groups, preparing learning materials and the facilities needed.

At the the second phase, the researcher conducted 8 weeks experiment and applied the strategies or models of learning. They were Problem-based Learning Model (PBL) to experimental group and Task-based Learning Model (TBL) to the control group.

The researcher firstly used readability test to make sure that the level of difficulty was suitable for the students. The researcher used Flesch formula accessed in (*No Title*, n.d.) http://www.readabilityformulas.com/flesch-reading-ease-readability-formula.php. The best reading score lays between 60-70 since it is acceptable and understandable. The following range presents the complete description about the readibility score based on *Flesch*: (1) 90-100: Very Easy, (2) 80-89 : Easy, (3) 70-79,: Fairly Easy, (5) 60-69: Standard, (6) 50-59 : Fairly Difficult, (7) 30-49 : Difficult, (8) 0-29: Very Confusing.

Post-test was given after the treatment to visibly show the result of students' comprehension after learning using the given models. Besides, the researcher used content validity to measure the validity of the instrument and used the formula of Hoyt to determine the level of the reliability of reading instrument in English as follows:

$$r = \frac{\text{RJK}_b - \text{RJK}_e}{\text{RJK}_b}$$

Note:
R = Reliability of appropriateness of observer/rater

RJK$_b$ = variance of the respondence
RJK$_e$ = rest of variants

The 30 questions multiple couice test become the instrument of the test. The questions given reflected the six elements of critical thinking: Interpretation, Analysis, Evaluation, Inference, Explanation and Self-regulation suggested by Facione (2011). Besides, the questions were constructed based on level of difficulty in taxonomy Bloom's revision suggested by Anderson dan Krathwohl. They are Remember (C1). Understand (C2). Apply(C3), Analyze (C4), Evaluate (C5), and Create (C6). Besides, the theoritical validity test involved 5 experts to judge. It showed that the theorotical validity was applicable. Then, this research measured instrument reliabily by using the formula of K KR-20:

$$\rho_{KR-20} = \left(\frac{N}{N-1}\right)\left(\frac{\sigma_A^2 - \sum \pi_i(1 - \pi_i)}{\sigma_A^2}\right)$$

Note:

ρ_{KR-20} = Coeficient Reliability KR-20

N = Sum of poin
σ_A^2 = Variance of respondent's score

π_i = Proportion 1 for each poin

The data analysis is as follow: (1) Conducting normality test using Liliefors test. (1) Conducting Homogenity test to population using F test and Bartlett test for the significance of a = 0,05. (2) Conducting data analysis using two-way analysis of variance or ANAVA on the level of significance of a = 0,05. (3) Conducting the analysis of Tuckey test.

RESULTS AND DISCUSSION
Results
Data description
The data of this study were grouped into eight groups of data, namely: (1) students 'English reading comprehension scores were given the PBL model strategy (A1), (2) students' English reading comprehension scores were given TBL model strategies (A2), (3) Students' English reading comprehension scores with high critical thinking skills (B1), (4) students' English reading comprehension scores with low critical thinking skills (B2), (5) students' English reading

comprehension scores given learning strategies PBL model with high critical thinking skills (A_1B_1)), (6) students 'English reading comprehension scores who were given TBL model learning strategies with high critical thinking skills (A_2B_1), (7) students' English reading comprehension scores who were given PBL model strategies with low critical thinking skills (A_1B_2), (8)) scores of students' English reading comprehension who are given TBL model strategies with low thinking skills (A_2B_2). Complete descriptions of the eight groups of research data are as follows:

English reading comprehension scores of students given the PBL model (A1)
Based on the data collected from 22 students as respondents, it was known that the scores of students' Reading comprehension in English who were given the PBL model got the highest score of 46; lowest score of 22; an average score of 33.82; median value 35.0; mode value 26; variance 43.11; standard deviation 6,57.

English reading comprehension scores of students given TBL model learning (A2)
Based on the data collected from 22 students as respondents, it was known that the scores of students' Reading comprehension in English who were given the TBL model had the highest score of 40; lowest score of 22; average score of 31.27; median value of 30.5; mode value of 29; variance of 22.68; standard deviation of 4.76.

English reading comprehension scores of students with high critical thinking ability (B1)
Based on the data collected from respondents as many as 22 students, it was known that the students' English Reading comprehension score with the highest critical thinking ability score was 46; the lowest score was 22; the average score was 34.05; median value was 35.0; mode value was 37; variance was 42.81; standard deviation ofwas 6.54.

English reading comprehension scores of students with low critical thinking ability (B2)
Based on the data collected from 22 students as respondents, it is known that the scores of students' English Reading Comprehension with low critical thinking skills get the highest score of 40; the lowest score of 22; average score of 31.05; median value of 30.0; mode value of 29; variance of 21.66; standard deviation of 4.65.

Students' English reading comprehension score given PBL model with high critical thinking ability (A1B1)
Based on the data collected from 11 students as respondents, it is known that the A1B1 score has the highest score of 46; lowest score of 35; an average score of 39.18; median value of 38; mode value of 35; variance of 11.96; standard deviation of 3.46.

English reading comprehension scores of students given a TBL model with high critical thinking ability (A2B1)
Based on the data collected from 11 students as respondents, it was known that the A2B1 score got the highest score of 37; lowest score of 22; an average score of 28.91; median value of 29; mode value of 26; variance of 19.89; standard deviation of 4.46.

English reading comprehension score students given learning strategy PBL model with low critical thinking ability (A1B2)
Based on the data collected from 11 students as respondents, it was known that the A1B2 score was the highest score of 36; the lowest score of 22; an average score of 28.45; median value of 28; mode value of 26; variance of 15.27; standard deviation of 3.91.

English reading comprehension scores of students given TBL model with low critical thinking ability (A2B2)
Based on data collected from 11 students as respondents, it was known that the A2B2 score had the highest score of 40; the lowest score of 29; an average score of 33.64; median value of 35; mode value of 29; variance of 15.45; standard deviation of 3.93.

Testing requirements analysis
The data analysis requirements to be tested in this study were the normality test and the homogeneity test.

Normality test
The normality test was carried out to know whether or not the sample came from the population of 44

students must be normally distributed. The normality test carried out in group A1: students' English Reading Comprehension scores which were given the PBL model, group A2: students' English Reading Comprehension scores which were given TBL model, group B1: students' English Reading Comprehension scores with high critical thinking, group B2 : students' English Reading Comprehension scores with low critical thinking, group A_1B_1: students' English Reading Comprehension scores who were given PBL model with high critical thinking, group A_2B_1: students' English Reading Comprehension scores were given TBL model with high critical thinking, group A_1B_2: students 'English Reading Comprehension scores were given the PBL model with low critical thinking, and group A_2B_2: students' English Reading Comprehension scores were with the ability of low critical thinking whether it came from a population whose distribution was normal.

Group A1 normality test
The normality test criterion was that the sample scores of students' English reading comprehension who are given the PBL model came from a population with a normal distribution if Lcount <Ltable. The largest Lcount value was 0.0863, Ltable for n = 22 with a significant level of 0.05 is 0.183. Thus, it could be concluded that the A1 data is normally distributed.

Group A2 normality test
The sample scores of students' English Reading Comprehension as the criterion used in the normality test who were given a TBL model came from a population that is normally distributed if Tcount <Ltable. The largest Lcount value was 0.1064, Ltabel forn = 22 with a significant level of 0.05 is 0.183. Thus, it could be concluded that the A2 data wass normally distributed.

Group B1 normality test
The criterion which was used in the normality test was the sample of students' English Reading Comprehension scores with high critical thinking omes from a population that was normally distributed if Tcount <Ltable. The largest Lcount value was 0.0869, the Ltable for n = 22 with a significant level of 0.05 was 0.183. Thus, it could be concluded that the B1 data is normally distributed.

Group B2 normality test
The normality test criterion used was the sample of students' English Reading comprehension scores with low critical thinking cames from a population that was normally distributed if the count <Ltabel. The largest Lcount value is 0.1321, Ltable for n = 22 with a significant level of 0.05 is 0.183. Thus, it could be concluded that B2 data was normally distributed.

Group A1B1 normality test
The normality test used the sample of students' English Reading Comprehension scores who were given a PBL model with high critical thinking, came from a normally distributed population if Lcount <Ltabel. The largest Lcount value was 0.1781, L tablen for n = 11 with a significant level of 0.05 is 0.249. Thus, it could be concluded that the A1B1 data was normally distributed.

Group A2B1 normality test
The basis used in the normality test was the sample of students' English Reading Comprehension scores who were given a TBL model with high critical thinking, came from a population that was normally distributed if Tcount <Ltabel. The largest Lhitung value is 0.1214, Ltabel forn = 11 with a significant level of 0.05 is 0.249. Thus, it could be concluded that the A2B1 data was normally distributed.

Score normality test for group A1B2
The criterion used in the normality test is that the sample of students' English Reading Comprehension scores who were given the PBL model with low critical thinking, came from a normally distributed population if Lcount <Ltabel. The largest Lcount value was 0.0997, Ltabel for n = 11 with a significant level of 0.05 was 0.249. Thus, it could be concluded that the A1B2 data was normally distributed.

Normality test for group A2B2
The normality test of the sample scores of students' English reading. Comprehension who were given the TBL model with low critical thinking came from a normally distributed population if Lcount < Ltabel. The largest Lhitung value s 0.1852, Ltabel for n = 10 with a significant level of 0.05 is 0.249. Thus, it could be concluded that the A2B2 data was normally distributed.

The recapitulation of the calculation results of the data normality test is shown in the following table:

Table 3. *Summary of normality test results*

Group	L_{count}	L_{table}	Status
A_1	0,0863	0,183	Normal
A_2	0,1064	0,183	Normal
B_1	0,0869	0,183	Normal
B_2	0,1321	0,183	Normal
A_1B_1	0,1781	0,249	Normal
A_2B_1	0,1214	0,249	Normal
A_1B_2	0,0997	0,249	Normal
A_2B_2	0,1852	0,249	Normal

Homogeneity test

In addition to the normality test, one of the requirements that needed to be done before testing the research hypothesis was the homogeneity test. The homogeneity test for the treatment group (A) used the F test. While the test for 4 cell groups in the experimental design used the Bartlett test at the level of $\alpha = 0.05$. The homogeneity test was carried out to determine whether the data variance was homogeneous or not.

Homogeneity test of variance for group A1 and group A2

Hypothesis tested:

H_0 : $\sigma^2_{A1} = \sigma^2_{A2}$

H_1 : not H_0

Based on the results of the calculation, it was found that Fcount = 1.98 was smaller than Ftable (0.05; 21: 21) = 2.08, so H0 was accepted. This means that the learning model of the two treatment groups had the same variance (homogeneous).

Homogeneity test of variance for groups A_1B_1, A_1B_2, A_2B_1, and A_2B_2

Hypothesis tested:

H_0 : $\sigma^2_{A1B1} = \sigma^2_{A1B2} = \sigma^2_{A2B1} = \sigma^2_{A2B2}$

H_1 : not H_0

χ^2count The test criterion was to accept H0 if $<$ χ^2 table in the real level $\alpha = 0.05$.

χ^2count (0.65) χ^2table for the significance level $(\alpha) = 0.05$ with the number of groups 4 - 1 = 3 was 7.82, which means that χ^2count = 0.65 while χ^2 Based on the calculation, the value of $< \chi^2$table (0.05; 3) (7,82) means that the meanings of the four groups are homogeneous.

Table 4. *Summary of homogeneity test results*

Group	Variance	Variance	χ^2_{count}	χ^2_{table}	Summary
		Combination			
A_1B_1	11,96				
A_2B_1	19,89	15,65	0,65	7,82	Homogen
A_1B_2	15,27				
A_2B_2	15,45				

Note:

A_1B_1 = Students' English reading comprehension score given the PBL model with high critical thinking

A_2B_1 = Student's English reading comprehension score given the TBL model with high critical thinking

A_1B_2 = Students' English reading comprehension score given the PBL model with low critical thinking

A_2B_2 = Students' English reading comprehension score given the PBT model with low critical thinking

χ^2count = Price of calculated chi squareχ

χ^2table = Price of chi squared tableχ

Hypothesis testing

Hypothesis testing in this study was carried out using two-way analysis of variance and continued with the Tukey test, if there was an interaction in the test. Two-way analysis of variance was used to examine the main effect and interaction effect between learning strategies and critical thinking skills on students' English reading comprehension scores. By using the two-way analysis of variance or anova table, the results were shown in table 5 below.

Table 5. *SPSS results for two-way analysis of variance*

Tests of Between-Subjects Effects					
Dependent Variable: English Reading Comprehension					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	827,091(a)	3	275,697	17,622	,000
Intercept	46605,091	1	46605,091	2978,826	,000
A	71,273	1	71,273	4,555	,039
B	99,000	1	99,000	6,328	,016
A * B	656,818	1	656,818	41,981	,000
Error	625,818	40	15,645		
Total	48058,000	44			
Corrected Total	1452,909	43			

a R Squared = ,569 (Adjusted R Squared = ,537)

Based on the results of the two-way analysis of variance (ANOVA) above, it can be explained:

Differences in students' English reading comprehension between groups of students given learning strategies of PBL model and groups of students given learning strategies of TBL model
Based on the results of the analysis of the variance of the two lines between A lines at a significant level of $\alpha = 0.05$, it was obtained that Fcount = 4.555 and Ftable (0.05; 1: 40) = 4.08 The summary could be seen in table 4:12 and the calculations could be seen in the appendix. Based on the Sig. in the Tests of Between-Subjects Effects table for the A row if it was less than 0.05 then the test result is significant or H0 was rejected. In table 4.12, it could be seen that the Sig. for row A was 0.039; less than 0.05, then H0 was rejected so that H1 was accepted. It could be concluded that there wass a significant difference in students' English reading comprehension between the group given the PBL model and the group given the TBL model. In other words, the PBL model ($\bar{Y}A1 = 33.82$) was higher than the TBL model ($\bar{Y}A2 = 31.27$). This means that the research hypothesis which stated that students 'English Reading Comprehension given the PBL model was higher than students' English Reading Comprehension given the TBL model could be accepted.

The interaction between learning strategies and critical thinking ability against students' English reading comprehension scores
Based on the results of the two-way variance analysis on the interaction between learning models and critical thinking on students' English Reading Comprehension scores, it could be seen in the two-way ANOVA calculation table above, that the value of the interaction Fcount = 41.981 and Ftable (0.05; 1: 40) = 4.08. Based on the Sig. in the Tests of Between-Subjects Effects table for rows A * B, provided that if it was less than 0.05 then the test result was significant or H0 was rejected. In Table 4.12, it could be seen that the Sig. for row A * B was 0.000; less than 0.05, then H0 was rejected so that H1 was accepted. The conclusion was that there was an interaction between learning strategies and critical thinking on students' English Reading Comprehension.

By testing this interaction, further testing was necessary. The follow-up test was intended to find out about: (1) the differences in the scores of students' Reading Comprehension in English who were given the PBL model and those who were given the TBL model for student groups with high critical thinking (A_1B_1 and A_2B_1); and (2) differences in the scores of students' English Reading Comprehension who were given the PBLmodel learning strategy and those who were given the PBT model for students with low critical thinking (A_1B_2 and A_2B_2). table 6 below. The calculations could be seen in the appendix.

Table 6. *Summary of the Tukey test calculation results*

No	Compared Group	dk	Q_{count}	Q_{table} $\alpha = 0,05$	Status
1	A_1B_1 with A_2B_1	4: 11	8,63	4,26	Significant
2	A_1B_2 with A_2B_2	4: 11	4,35	4,26	Significant

Differences in English reading comprehension of students given the PBL model and students given the TBL model in the group of students with high critical thinking ability
Students with high critical thinking have an influence on students' English reading comprehension scores with the existence of a model. This is proven based on the results of further tests using the Tukey test which results are as follows:

Table 7. *Comparison of groups A1B1 with A2B1*

No	Compared Group	dk	Q_{count}	Q_{table} $\alpha = 0,05$	Status
1	A_1B_1 with A_2B_1	4 : 11	8,63	4,26	Significant

The scores of students 'English reading comprehension who were given the PBL model with high critical thinking (A_1B_1) were compared with the students' English Reading Comprehension scores who were given TBL model with high critical thinking skills (A_2B_1), obtained Qcount = 8.63 and Qtable (0.05).; 4: 11) = 4.26. Thus, Qcount is greater than Qtable, so H0 was rejected, it could be interpreted that there was a significant difference between students' English Reading Comprehension scores and high critical thinking between PBL model and TBL model. In other words, students

who were given the PBL model with high critical thinking ($\bar{Y}$A1B1 = 39.18) were higher than those given the TBL model with high critical thinking ($\bar{Y}$A2B1 = 28.91) on the score of students' English Reading Comprehension.

Thus, the research hypothesis which stated that students' English Reading Comprehension with high critical thinking who were given the PBL model was higher than the TBL model could be accepted.

Differences in English reading comprehension of students given PBL model and students given TBL model in student groups with low critical thinking ability

Students with low critical thinking gave some effects to their scores of English reading comprehension. This was because of learning strategy. This was then based on the follow up Tukey test with the following result:

Table 8. *Comparison of groups A1B2 with A2B2*

No	Groups' Comparison	dk	Q_{count}	Q_{table} $\alpha = 0,05$	Note
2	A_1B_2 with A_2B_2	4 : 11	4,35	4,26	Significant

The scores of students' English Reading Comprehension who were given the PBL model with low critical thinking skills (A_1B_2) were compared with the English reading comprehension scores of students who were given TBL model with low critical thinking (A_2B_2), obtained Qcount = 4.35 and Q table (0, 05; 4: 11) = 4.26. Thus, Qcount was greater than Qtable, so H0 was rejected, it could be interpreted that there was a significant difference between students' English Reading Comprehension scores and low critical thinking between PBL model learning and TBL model. In other words, students who were given the PBL model with low critical thinking ($\bar{Y}$A1B2 = 28.45) were lower than those given the TBL model with low critical thinking ($\bar{Y}$A2B2 = 33.64) on the students' English Reading Comprehension score.

Thus, the research hypothesis which stated that students' English Reading Comprehension with low critical thinking who were given the PBL model was lower than the TBL model could be accepted.

Discussion
The general objective of this study was to obtain a more complete picture of the effect of learning methods and critical thinking skills on students'

English reading comprehension. Based on the results of the two-way analysis of variance in line A, it was found that Fcount was 4.555 greater than Table (0.05; 1: 40) = 4.08 with a probability value (Sig.) Of 0.039 which was smaller than the significant level (0.05). This shows that the students' English Rading Comprehension scores can be a significant difference between the PBL model and the TBL model. This difference is indicated by the average score of students 'English Reading Comprehension given the PBL model of 33.82 and the average score of students' English reading comprehension given the TBL model of 31.27. This means that there are differences in the scores of students' English reading comprehension who are given the PBL model and those who are given the TBL model. This supports Dastgeer's & Afzal's (2015) theory that PBL was more effective than other method for teaching English writing skill to the secondary level students. It means that PBL may also be applicable for teaching Reading Comprehension.

The results of the two-way analysis of variance on the A * B interaction line found that the interaction Fcount of 41,981 was greater than Ftable (0.05; 1: 40) = 4.08 with a probability value (Sig.) Of 0.000 smaller than the significant level (0.05). This means that there was a significant interaction effect between learning strategies and critical thinking skills on students' English Reading Comprehension. Because there is a significant interaction effect, it is followed by the Tukey test for the two cells in the experimental design. This result supports Lismayani, Parno, & Mahanal (2017) who said in their findings that there is a relationship between students critical thinking skill and problem-solving ability. That shows that there is an interaction between critical thinking and models of learning.

The results of the Tukey test on students 'English reading comprehension scores with high critical thinking skills obtained a value of Qcount = 8.63 greater than Qtable (0.05; 4: 11) = 4.26. This means that there was a difference in the scores of students' English Reading Comprehension who are given learning strategies PBL model and given the TBL model for student groups with high critical thinking. Thus, it could be concluded that the average score of students' English Reading Comprehension with high critical thinking, in the group of students who were given the PBL model of 39.18 was higher than

the group of students who were given the TBL model learning strategy of 28.91. This result is in line with Awang & Raml stated in Sada, Mohd, Adnan, & Yusri (2016) that PBL enables students to use and develop a high thinking skill.

The results of the tuke test on students' English Reading Comprehension scores with low critical thinking obtained the value of Qcount = 4.35 greater than Qtable (0.05; 4: 11) = 4.26. This means that there were differences in English Reading Comprehension scores of students who are given the PBL model and those who are given the TBL model for student groups with low critical thinking. Thus, it could be concluded that the average score of students' English Reading comprehension with low critical thinking, in the group of students who were given the PBL model of 28.45 was lower than the group of students who were given the TBL model of 33.64. This result is in line with Awang & Ramly stated in Sada et al. (2016) that PBL enables students to use and develop a high thinking skill, not a low thinking skill. The lower thinking skill in TBL will transparently becomes dominant in score that makes TBL get better score than other models including PBL.

CONCLUSION

All the questions raised have been answered through the data analysis made. Then the research comes to the conclusions after learning all the results and findings. Consequently, H1 is accepted since PBL model gives students' higher comprehension in English Reading Text compared to TBL model. Concerning with the interaction between the two models (PBL and TBL) and critical thinking against the score of Students' Reading Comprehension, it was significant that there was interaction between them. This proves that H0 is rejected and H1 is accepted after it was analized by using two-way analysis of variance.

Besides, students who were given the PBL model with high critical thinking got higher score in English Reading Comprehension compared to those given the TBL model with high critical thinking. It was proven that H0 is also rejected and H1 is accepted after the Tukey test. At last, it is also proven that H0 is also rejected since the students who were given the PBL model with low critical thinking were lower than those given the TBL model with low critical thinking on the students' English Reading Comprehension score.

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