PROJECT

by Dina Merris

Project-Based-Learning on Critical Reading Course to Enhance Critical Thinking Skills

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Abstract

In some cases, EFL (English as a Foreign Language) students may be lack critical thinking in reading, particularly in Indonesia. The purposes of this study were to investigate the implementation of Project-Based-Learning (PjBL) on critical reading to enhance critical thinking skills and describe the students' responses on the implementation of PjBL in critical reading to enhance critical thinking skills. This research employed a mixed-method approach. The subjects of this research were 26 EFL students at STKIP PGRI Sidoarjo, Indonesia. The data were obtained by using observation, interviews, and questionnaires. Data analysis techniques included data reduction, data presentation, and data conclusion. This study produced several results. Firstly, the implementation of PjBL on critical reading course to enhance critical thinking skills consisted of three stages: 1) planning, 2) implementing, and 3) evaluating. Secondly, based on the interviews, 88.89% of the students were motivated in working on the assignments by using the PjBL model, and 54% of them were excellent. Thirdly, based on the questionnaire, most students (73%) chose "strongly agree" with critical thinking skills. It is hoped that the findings of this research can give information about students' critical thinking and give an appropriate learning model to enhance the students' critical thinking.

Keywords: Project-Based Learning (PjBL), critical reading course, critical thinking skills.

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1. INTRODUCTION

The Industrial Revolution 4.0 as a phase of the technological revolution has changed the way of human activities in the scale, scope, complexity, and transformation of experiencing life. Humans can live in global uncertainty; therefore, they must have the ability to predict a very fast-changing future (Sari, 2019a). One of the essential elements that must be of concern to encourage economic growth and national competitiveness in the revolutionary era of Industry 4.0 is preparing a learning system that is more innovative and that can improve the competency of graduates who have 21st-century skills.

This world is full of competition and challenges, so we require human resources who have high abilities to solve various problems. Someone who owns a high ability must be able to think logically, rationally, critically, and creatively. Fisher (2001) explains that critical thinking gives a proper direction to think and work and helps in determining the relationship of something with another so that it can make the right decisions. Therefore, critical thinking is an intellectual process activity carried out actively and fully capable of conceptualizing, applying, analyzing, synthesizing, and evaluating information obtained or collected through observation, experimentation, reflection, reason, or communication, as a clue to believe and to act. Nevertheless, the Indonesian students' reading ability from the reading test released by PISA in 2015 was ranked 64 of 70 countries. This shows that the students' reading skills are classified as very low. Thus, teachers and lecturers must make efforts to improve the students' reading skills. They can practice critical thinking to solve problems found in every text read. The students can develop their critical thinking by reading critically.

Critical reading is valuable to implement because it does not only develop the cognitive aspect (understanding the text) but also the affective aspect (reading behavior). The importance of critical reading has inspired ELT researchers to study it more intensively. Macknish (2011) conducted small-scale action research for post-secondary ESL Chinese students in Singapore. The study reveals that the students were engaged with a critical reading discourse when they were facilitated with scaffolding and opportunities to practice. In other words, having an effective teaching strategy becomes the main concern to improve the students' critical reading. A reading class facilitates the students with the text representing the advanced level.

One alternative learning model that is considered capable of improving critical thinking skills in critical reading is Project-Based Learning (PjBL). Students are expected to be able to produce a product during the learning process (Osakue & Thomas, 2011). In learning by using the PjBL model, they are required to work together in a group, share ideas and arrange a project timeline assigned to finish on time. Project-based learning is an authentic learning model or strategy in which students plan, implement, and evaluate projects that have real-world applications beyond the classroom (Westwood, 2008).

Based on the researchers' observation in one of the classes of a university in Sidoarjo, Indonesia, most students showed their low ability when they were asked to read critically in English. They seemed confused or nervous when the lecturer asked them to read an English text critically. It was only about 35% of 26 students in the class who could practice critical reading as well as their critical thinking confidently, but others seemed nervous and confused. When the lecturer asked them why they felt the anxiety to practice the critical reading, almost all of the students said that they were

worried about the mistakes they made especially in grammar and meaning. Some of them were also not confident in practicing English. Based on the preliminary study, the problems that occurred during a critical reading course were that the students were less able to improve critical thinking skills. This is evidenced by the in-depth analysis when given reading text. The main cause of the problem is that the teacher did not vary learning models in teaching reading to the students.

Therefore, PjBL in the critical reading course is needed. Based on the description above, the researchers were encouraged to conduct this research that aimed at explaining the implementation of PjBL, finding out whether PjBL is effective to improve the students' level of critical thinking, and describing the students' responses towards the implementation of PjBL in a critical reading course that can develop students' critical thinking skills. The results of the study are expected to be useful to enrich the learning of critical reading especially by using PjBL to enhance students' critical thinking skills.

2. LITERATURE REVIEW

2.1 Critical Thinking

It seems that nowadays a skill is likely to emphasize more on specific specialties. Thus, education goals should be focused on shaping skills and relevant attitudes. Education plays a vital role in developing skills, knowledge of values, and attitudes that enable people to contribute to a sustainable future (Sari, 2016). Moreover, education needs to equip students with the skills they need to become responsible, active, and engaged citizens. The five main domains of 21st-century skills are digital literacy, intensive thinking, effective communication, high productivity, and spiritual and moral values (Osman et al. 2013). Griffin and Care (2015) classify competencies required in the 21st century as critical thinking skills, creative skills, communication skills, and collaboration skills. Critical thinking skills are fundamental skills in solving problems. This skill is important for students to find sources of problems and how to search for and find the right solutions. Therefore, lecturers play an important role in designing and developing learning programs that are more focused on empowering these skills (Sari, 2019b).

Critical thinking implies a mental activity that is carried out by someone who is able to consider by using a certain size or standard (Zubaidah et al., 2018). Johnson (2002) explains that critical thinking is a mental activity to formulate or solve problems, make decisions, understand certain things, find answers to questions, and find relevant answers. It is self-regulation in judging something, producing interpretation, analysis, evaluation, and inference, as well as exposure using proof, concept, methodology, criteria, or contextual consideration on which to base decision making. Moreover, the definition of critical thinking according to Proulx (2004) is a process according to the steps for analyzing, testing, and evaluating arguments.

Critical thinking skill is a cognitive skill related to the mind. Trilling and Fadel (2009) define critical thinking as the ability to analyze, interpret, evaluate, summarize, and gather information. According to Erdoğan (2019), it is a reflective way of thinking that makes sense or is based on common sense focused on determining what to believe and do. It entails the examination of those structures or elements of thought implicit in

all reasoning: purpose, problem, or questionable-issue, assumptions, concepts, empirical grounding, reasoning leading to conclusions, implication, and consequences, the objection from alternative viewpoints, and frame of reference (Jenicek, 2006).

Moreover, critical thinking is a skill with the aim of processing, decomposing, and manufacturing hypotheses. It generally uses a more diverse range of information. The process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information to reach an answer or conclusion. Critical thinking is a type of thinking pattern that requires people to be reflective, and pay attention to decision-making which guides their beliefs and actions. It allows people to deduct with more logic, process sophisticated information, and look at various sides of an issue so they can produce more solid conclusions. It is one of the higher-order thinking skills which refer to the goal, interpretation, analysis, evaluation, and conclusions, as well as an explanation of considerations that contain evidence, conceptual, methodological, or contextual. It is a dominant skill that has to be taught explicitly and regularly (Zubaidah et al., 2018). With higher-order thinking skills, students can absorb knowledge and demonstrate their performance, and become effective communicators, critical thinkers and dynamic, competent problem solvers, and experts in their careers (Zivkovil, 2016).

2.2   Critical Reading

Reading is one of the most important skills that should be learned by the students. Reading, especially reading-intensive is a complex thing to be learned because the students need to understand the words first in producing a proper sound. The changing times demand increased competitiveness and people's mindset as well as the younger generation, which is students. Therefore, to face intense global competitions, students must be equipped with language skills, namely listening, speaking, reading, and writing, through learning in schools. Learning activities are closely related to the language process (Sari, 2016). This learning needs to be balanced with interest. Students who have a high interest in learning will always pay full attention to their efforts to achieve learning goals. Furthermore, language skills are closely related to the processes that underlie the mind; for instance, the more skilled a person is in speaking, the brighter and clearer the way of thinking is (Sari, 2019c).

Reading is the process of decoding written symbols with full attention, understanding, appreciation, and interpretation to obtain information, capture content or messages, and understand the meaning of communication that has been conveyed by an author (Sari & Wardhani, 2020). It is a basic knowledge system to obtain information and deepen knowledge (Zhou, 2018) because someone needs to know and interpret the functions of texts accurately. Moreover, Anggraini et al. (2018) reveal that reading is an activity to recognize and observe a text in order to obtain the information contained in it. It can be done with any reading materials as evidenced in Darmuki et al. (2016) who state that reading, for example, reference books will help readers to improve language skills. Based on the above opinion it can be concluded that the aspects of reading are the skills to understand and interpret information.

Reading skills can be classified into two types according to their forms, namely: intensive reading and extensive reading (Sari, 2020). Intensive reading is a way of reading by understanding a text carefully. The process of intensive reading includes word recognition, literal understanding, and interpretation. Intensive reading can

improve reading achievement and reduce difficulty factors when reading (Roberts et al., 2015). Meanwhile, extensive reading is called extreme reading which is carried out extensively and comprehensively (Boudah, 2018). Accordingly, it can be concluded that intensive reading is a literacy activity carefully done to understand texts with high accuracy and achieve a thinking process in the form of rationalization of what is read by analyzing and criticizing the texts to produce new knowledge, meanwhile, extensive reading is a literacy activity carried out extensively and comprehensively. Hence, critical reading is a form of the intensive reading process.

To apply critical reading is an attempt to find potential strategies to help students think critically in responding to texts. Ko (2013) asserts that through critical reading one might be able to encourage students to think effectively, analyze accurately, and evaluate texts carefully. Meanwhile, Nasrollahi (2015) suggests that the steps of critical reading strategies are: 1) annotating (making a note, circling keywords, and writing comments), 2) previewing (learning about a text before really reading it), 3) contextualizing (placing a text in its cultural contexts, biographical contexts, and historical contexts), 4) outlining (identifying the main ideas), 5) analyzing (analyzing the main idea and supporting idea), 6) summarizing (restating main ideas in their own word), 7) paraphrasing (paraphrasing the main idea without changing the meaning), 8) synthesizing (producing something by combining different things), 9) questioning (asking questions about the content), and 10) reflecting (testing the logic of a text as well as its credibility and emotional effect).

The positive effects of critical reading have been found in previous studies. A case study of critical reading at Kashan University investigated by Dar et al. (2010) surveyed the change in students' views toward learning the English language and in their critical language awareness. From observations and questionnaires, it was revealed that 90% of students' critical language awareness increased. Another case study was conducted by Baleghizadeh and Babapur (2011) in Iran. Their subjects consisted of 50 intermediate female students who were divided into two groups. The first group was asked to read a text and write the summary of it, meanwhile, the second group read it without writing the summary. For evaluation, the two groups were given a reading comprehension test with 20 multiple choice questions. The results showed that summary writing promoted the reading comprehension of Iranian EFL learners.

2.3 Project-Based Learning

Project-based learning (PjBL) is a learning model that refers to philosophical constructivism so that students can construct their own linguistics knowledge through real experiences. Thus, the application of the PjBL model can enhance students' critical thinking skills and overall linguistics competence. Based on existing studies, PjBL is proven to integrate all four language skills possessed by learners such as listening, speaking, reading, and writing to complete implemented activities. Project work makes learners deliberately involved in learning a language so that they can learn it in an authentic context. In the collaboration process carried out, learners will increase their communication skills, which can, in turn, open up opportunities for them to exchange information, negotiate ideas, and increase decision-making abilities (Carrio-Pastor & Skorezynska, 2015). Moreover, PjBL can attract learners to be actively involved in the language learning process. Railsback (2002) also finds that there are possibilities for learners to do project work, not only during classes but also outside of

classes. This is due to the fact that PjBL is able to sustain the students' interests in the learning process.

The effectiveness of PjBL on the students' English performance has been proven by previous studies. A research in a Malaysian university conducted by Musa et al. (2012) found that through PjBL, students acquired relevant reading skills such as skimming and scanning, gathering information, and identifying relevant ideas related to the project undertaken by their group. Another research at the University of Memphis conducted by Tamim and Grant (2013) showed that there was increased effort and performance, improved learning, and the acquisition of a variety of academic and non-academic skills through PjBL.

Besides linguistics performances, PjBL has also been found to effectively boos students' positivity in learning. Shin (2018) discovered that learners could boost up their self-confidence in a language classroom after they were taught by using PjBL. In his research, Shin (2018) found that project-based learning brings a significant impact on their confidence so that it can be part of the learning process. Similarly, Fried-Booth (2002) showed that through the implementation of PjBL, not only were the learners able to produce the final product as expected but also, they could increase self-confidence and independence within learning.

3.   METHODS

The subjects of this study were 26 university learners of the 4th semester majoring in the English Education Department at Sekolah Tinggi Keguruan dan Ilmu Pendidikan Persatuan Guru Republik Indonesia (STKIP PGRI) Sidoarjo, Indonesia. Before conducting this study, a preliminary study had been done at this university. The researchers observed one of the classes (class A) that was studying critical reading. The learners seemed confused or nervous when the lecturer asked them to read an English text critically. It was only about 35% of 26 students in the class who could practice critical reading in English confidently, while others seemed nervous and confused. When the lecturer asked them why they felt anxious to practice critical reading, almost all students said that they were worried about the mistakes they made, especially in grammar and meaning.

To conduct this study, the researchers employed a mixed-method approach. It involves the collection and analysis of both qualitative and quantitative data (Creswell, 2003). This approach involves two philosophical assumptions derived from qualitative and quantitative methods with mixed-method, this research used sequential explanatory design in which the researchers used quantitative method at the first stage and qualitative method at the second stage. This study used the experimental research of the Pretest-Posttest Design. Both tests given were in the form of descriptive questions. The test questions have been tested for validity and reliability.

The data were analyzed by means of the t-test with the test requirements for normality and homogeneity tests using SPSS 20 software. The data analysis is the result of quantitative research in the first stage, and qualitative research in the second stage is analyzed with the sequential explanatory method. The quantitative method analysis in the first stage was testing; data were obtained from the pre-test and post-test results of critical thinking skills using the PjBL model. Then, the qualitative method analysis on the second stage involved (1) observation, interview, and

questionnaire: data obtained from informants and observations in the learning process using the PjBL model, (2) data reduction: selecting important data, creating categories, and eliminating the unnecessary data; (3) present quantitative and qualitative data into a pattern, tables or graphs; (4) conclusion/verification: drawing conclusions and verification of research.

According to Creswell (2003), the steps of mixed research methods used the sequential explanatory design. In this research, the first stage of quantitative methods was used to determine (potential) problems and formulate problems, conduct theoretical studies and formulate hypotheses, collect and analyzed data, and so conclusions can be made based on the results of testing. The second stage of qualitative methods was to prove, strengthen, deepen, expand, weaken or abort data from (1) data sources, (2) data analysis, and (3) conclusion of the research results.

4. RESULTS

4.1 The Implementation of PjBL

The learning process using a constructive PjBL model on critical reading to enhance students' critical thinking skills consisted of three main stages, namely: planning, implementation, and evaluation.

4.1.1 Planning

A lesson plan using the PjBL model can improve the critical thinking skills expressed in it. A lesson plan has an important role in guiding lecturers to carry out their duties as educators who serve the students' learning needs. Here, the lecturer created the lesson plan that included the steps of PjBL on critical reading, learning media, and assessment.

4.1.2 Implementation

The PjBL model steps were conducted as follows:
1. Basic Questions Determination: the students determined the basic questions and answers to these questions through PjBL activities. One of the principles of PjBL learning is to be motivated by questions and answers through the project and return when they discover new information and concepts. It is also called prior knowledge, so it is related to the knowledge that has been known before by the students.
2. Project Determination: students chose projects that were personally relevant and learned to monitor themselves as they identified goals, resources, and time needed to complete their assignments. These products included: making an article of the national or international journals from 14 selected journals and making a collection of journal articles in the form of books out of 26 students' entire work texts.
3. Project Planning: these steps included determining material for critical reading, developing knowledge, developing ideas, and reading completion. Project-based learning is an approach that emphasizes learning that can come from long-term

activities that are interdisciplinary, student-centered, and integrated with real-world problems and practices. So, by preparing an appropriate plan, it helped the students to carry out project activities accordingly.

4. Schedule Arrangement: this activity was carried out by determining the time needed to complete the project. So, the students could complete activities on time. However, the learning process was flexible because it involved interaction and collaboration between the students and the lecturer. The duration of the project was determined, and the time for project completion could be hours to weeks.

5. Project Implementation: at this stage, students carried out the steps of critical reading by reporting each activity to the lecturer. Students were also facilitated with answers if there were questions about the project being carried out. The lecturer had an important role in project-based learning. The lecturer filled out tables with initials or check marks on monitoring activities. Monitoring conducted by the lecturer was twofold, namely monitoring the time to see the student's accuracy or inaccuracy in completing each activity, and monitoring the activities was to see whether the students had completed the activities or needed further revision.

6. Presentation: the activities carried out at this stage were to complete a journal article based on the steps of the activities that have been carried out. The finished text was read in front of the class by a member selected from each group. Project work provides opportunities for students to promote their achievements. The design of this activity was in the form of order regarding reporting or presentation activities.

7. Evaluation: at this stage, students' mastery of skills was measured through performance-based assessments including rubrics, self-evaluation, and reflection. Here, the students also needed feedback, such as peer feedback and lecturer feedback. Students judged themselves by filling the table with initials or a checklist. This is useful as a reflection of knowledge or activities that have been mastered by students.

4.1.3 Evaluation

At the end of the learning process, the lecturer and students did a reflection on the activities/projects that had been carried out. At this stage, the lecturer evaluated the students' level of critical thinking during the activation process.

In this study, the researchers used a test in a description form that had been tested for validity and reliability for use as a quantitative data collection instrument. Based on a number of theories, there were seven items of critical thinking used in this study: (1) summarizing problem, question, or issue, (2) considering context and assumptions, (3) communicating own perspective, hypothesis, or position, (4) analyzing supporting data and evidence, (5) using other perspectives and positions, (6) assessing conclusions, implications, and consequences, and (7) communicating effectively. The validation results were carried out by the validator. To evaluate each component of critical thinking skills, a holistic critical thinking scoring rubric was used.
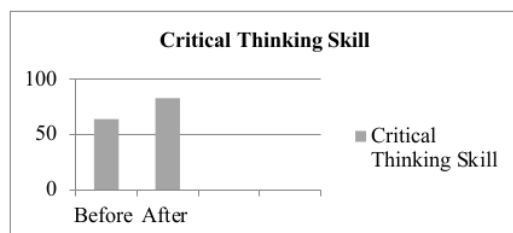
Figure 1. The result of students' critical thinking skills.

Based on Figure 1, the quantitative data analysis of the students' critical thinking skills who were taught by using the PjBL model, it shows that there is an increase in critical thinking skills after the model was implemented. There is a 19% increase in critical thinking skills from 64% before PjBL implementation to 83% after PjBL implementation. A further detailed result is presented in Table 1.

Table 1. The level of students' critical thinking skills.

Range of score	Level of students' critical thinking skill	Total students	Percentage
80-100	Excellent	14	54%
60-79	Good	8	30%
40-59	Fair	3	12%
20-39	Poor	1	4%
0-19	Very Poor	0	0%
	Total	26	100%

Table 1 shows that the range of the average score is classified into five categories: a total average score of 80-100 indicates excellent critical thinking, a total average score in the rank of 60-79 indicates good critical thinking, a total average score in the rank of 40-59 indicates fair critical thinking skill, a total average score in the rank of 20-39 indicates poor critical thinking skill, and finally, a total average score in the rank of 0-19 indicates very poor critical thinking skill. Table 1 demonstrates that 54% (14) of 26 students experienced an excellent level of critical thinking skill, 30% experienced a good level of critical thinking, 12% experienced a fair level of critical thinking, 4% experienced a poor level of critical thinking, and 0% experienced a very poor level of critical thinking. It can be said that most students experienced an increased level of critical thinking skill in the critical reading activity through PjBL.

4.2 The Students' Responses to the Implementation of PjBL

All of the students gave a positive response to the implementation of learning with the PjBL model. During the learning process, they enthusiastically participated in every step of learning.

Figure 2 shows the students' responses based on the questionnaire of the Likert Scale. Each of the items in the questionnaire has a 5-point scale ranging according to strongly agree (scale point 5), agree (scale point 4), neutral (scale point 3), disagree (scale point 2), and lastly, strongly disagree (scale point 1). The students were asked to give a checklist on the available columns (see Appendix 1).
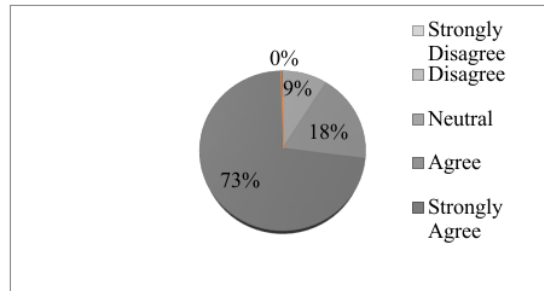
Figure 2. The result of students' responses.

Based on Figure 2, most students (19 73%) strongly agreed with the significance of critical thinking skills, whereas 5 students or 18% agreed with it. Merely 2 students, equivalent to 9%, felt neutral with the importance of critical thinking, yet none disagreed and strongly disagreed with the essence of critical thinking skill.

Some 18 students were selected as the interview participants. They were divided into three classes, namely the high group students who scored between 83 and 100, the medium group students who obtained scores between 67 and 82, and the low group students who received scores from 0 to 66. Based on the analysis of qualitative data obtained from interviews, the results indicate that as many as 77.78% of the participants stated that they were pleased to learn the critical reading course using the PjBL model. As alleged by one respondent, "I am happy to follow the critical reading course using the PjBL model". Meanwhile, as many as 88.89% of the participants were found to be more driven in learning when doing assignments using this model. As said by one respondent, "I am more motivated on doing assignments by using the PBL model". Finally, 80.56% of the participants fulfilled the seven indicators of critical thinking skills. As revealed by one respondent, "by learning using this model, I now can summarize the problem in the text I am reading, make assumptions, present my own perspective of the problem and communicate much better with my peers". To conclude, the PjBL model created a new atmosphere in the critical reading class and positively influencing the students' overall critical thinking skills.

5.   DISCUSSION

PjBL is a model or a learning approach that is innovative and emphasizes contextual learning through complex activities (Bell, 2010). As an effort to facilitate the learners to develop critical thinking skills, learning had to encourage the learners to be active so that they were free to think and question about what they received during the learning process (Snyder & Snyder, 2008). The results of observations and interviews indicate that both the lecturer and students influenced the success of implementing the PjBL learning model in the classroom.

Lecturers have an important role in stimulating students in developing their critical thinking processes. They are one of the human elements in educational activities who are able to understand the basis and direction of goals as well as education policy (Wong, 2007). They must master the subject, be able to design teaching and learning programs, capable of creating conducive classroom conditions, and skillful in using media and learning resources for their students.

In this study, the lecturer designed the PjBL steps in his teaching material correctly and performed them as expected. He had created the class atmosphere of PjBL on the critical reading course. From the first until the seventh meeting, he implemented the steps of PjBL, starting with basic question determination, project determination, project planning, schedule arrangement, project implementation, presentation, and evaluation. The critical reading material that the students worked with was chosen based on their interests. Besides doing critical reading activities in the classroom, the students were also given a chance to do reading at home for any kinds of reading materials independently in their leisure time. The integration of several learning strategies was intended to support the development of students' critical thinking.

Furthermore, through critical thinking, students were invited to participate actively and effectively to build their own knowledge. This is as reported by Changwong et al. (2018), where EFL students in Thai also experienced higher average scores in terms of critical thinking ability and academic achievement after using PjBL. There must be questions that encouraged students to understand and solve a problem, to analyze, evaluate, and interpret their thoughts better. Hence, errors in working problems could be minimized. The students were active and enthusiastic, and this was seen from their activities in the teaching-learning process. The students felt free to find a way to show up their understanding of knowledge. This was shown through the results where 88.89% of the learners felt motivated on doing assignments by using the PjBL model and 54% of students' critical thinking skills who were taught by using the PjBL model were categorized as being excellent. The questionnaire also revealed that more than half of the students responded positively to the PjBL model in the classroom. This is in accordance with Sanavi and Tarighat (2014), who claim that raising critical thinking awareness explicitly has a significantly positive impact on EFL learners where the critical thinker becomes a better language learner.

The results of this study further showed that most of the students performed as expected, and only one student had a poor level of participation. It is expected that the lecturer further motivates students with poor performance to enhance their critical thinking skills. Boubouka and Papanikolaou (2013) contend that PjBL motivates students to think critically, not to be worried about making mistakes (Erdoğan, 2019), and involves students in critical thinking activities and having an active role in critical reading (Zhou, 2018). To further understand the problem of the poor performed student in this study, the lecturer can mediate him or her further individually through the PjBL model. This is as suggested by Zubaidah et al. (2018) that lecturers can enhance students' critical thinking by growing learners' reading interest, establishing cooperation and discussion between them, running pair and work activities, and increasing their motivation to think critically.

6. CONCLUSION

Based on the results of this study, the following conclusions were obtained. Firstly, based on the observation, it can be concluded that the implementation of PjBL on critical reading course to enhance critical thinking skills consisted of three stages, namely: planning, implementation, and evaluation. Secondly, based on the analysis of qualitative data obtained from the interviews, it shows that 88.89% of the learners felt

motivated on doing assignments by using the PjBL model. Furthermore, 54% of students' critical thinking skills who were taught by using the PjBL model were categorized as being excellent. Fourthly, based on the questionnaire, 73% of the learners strongly agreed with the PjBL model to improve their critical thinking skills.

This study is expected to contribute ideas in the effort to improve the quality of English learning, especially in enhancing the learners' critical thinking skills. Therefore, the following suggestions are given. For lecturers, since the PjBL model takes some time, lecturers who want to use them are expected to manage their time well, prepare and carry out learning as effectively as possible so that it can be completed properly and on time. Moreover, during group discussions, lecturers must guide learners so that the concept of the materials is in accordance with the learning objectives. For researchers who intend to research the PjBL model in relation to critical thinking skills, it is suggested to include other aspects such as other language skills, and use other materials, as well as having respondents from other different levels of education.

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APPENDIX

Table A1. The items of students' critical thinking questionnaire.

No	Items
1	I am a person with logical thinking.
2	I am good at solving problems.
3	I can easily organize my thoughts.
4	I appreciate myself.
5	I can objectively analyze the problem.
6	I can look for the truth which would support my opinion.
7	I like to look for discovering the truth.
8	I assess statements and arguments.
9	I am able to admit a lack of understanding.
10	I have a sense of curiosity.

Table A1 continued…

11	I am interested in finding new solutions.
12	I am able to clearly define a set of criteria for analyzing ideas.
13	I am willing to examine beliefs, assumptions, and opinions.
14	I listen carefully to others.
15	I am able to give feedback.
16	I examine problems closely.
17	I look for proof.
18	I am able to reject the incorrect information.
19	I suspend judgment until all facts have been considered.
20	I see that critical thinking is a long-life process of self-assessment.

PROJECT