

# The Effect of PBL and DRTA on Critical Thinking and Reading Comprehension to Students in Elementary School

Arief Cahyo Utomo  
*Graduate Program*  
 Universitas Negeri Yogyakarta  
 Yogyakarta, Indonesia  
 Arief.cahyo2015@student.uny.ac.id

Kastam Syamsi  
*Graduate Program*  
 Universitas Negeri Yogyakarta  
 Yogyakarta, Indonesia  
 kastam@uny.ac.id

**Abstract**—This research aims to know the difference in effectiveness between the PBL and DRTA in terms of critical thinking and reading comprehension in elementary school. This study is a quasi experiment research. The subject of research is the elementary school students. The instruments used were the utilization of the test. The data collected is the data of reading comprehension and critical thinking skills. The data was analyzed with the MANOVA with the assistance of SPSS program. The results showed that there was a difference in the effectiveness between the PBL and DRTA. Increased critical thinking skills of second grade experiment was 35.74% for class 1 using PBL and 72.75% to class 2 using DRTA. In regard to the improvement of reading comprehension in the experimental class 1 class with PBL, the result was 42.13% and experimental class 2 with DRTA was 60.65%.

**Keywords**— PBL, DRTA, critical thinking, reading comprehension.

## I. INTRODUCTION

Elementary school is one of the underpinning avenues for students to improve their skills. One of the skills that can clearly be improved by students is in reading comprehension skills. A robust and effective reading skill during primary years is undeniably one of the most essential skills for students to achieve higher education. Students will acquire knowledge and new insights by reading which eventually lead them to face the challenges in the future. Reading has also become a key factor in life as many complex instructions involve the activity of grasping and understanding what is being read. Despite the fact that information can be found through other media such as audio visual media but the role of reading cannot be completely replaced. Therefore, the skills of reading should be seen as a concern and thus, given more attention particularly to students in elementary school as this early step will affect to their future development.

In addition, improving the reading skills is also associated to the development critical thinking skills.

Critical thinking will help students to have deeper analysis and thought about reliable news and information. Critical thinking skill is also the focus of observation because it is the purpose of the study which is to encourage students to be more critical readers. Teaching students as subjects of learning requires an appropriate model and strategy in order to develop their critical thinking ability. The model and learning strategies will be than main reasons for a successful result. The selection of appropriate learning strategies is intended to help students to improve their ability in mastering an optimal learning. Increased skills of reading comprehension and critical thinking skills can be achieved by applying a strategy learning called DRTA (Directed Reading Thinking Activity) and problem based learning (PBL). DRTA is expected to increase reading comprehension skills and critical thinking skills of students and also to encourage students to be more active in learning and improving student learning outcomes.

## II. RELATED WORKS/LITERATURE REVIEW

### A. *The Sense of Reading Comprehension*

According to Mousavian Guo, [1][2][3][4][5] reading comprehension is an active process in which the reader uses the information in a given text to construct the meaning. Reading comprehension is a process that involves reasoning and recalling memory in an effort to find and understand the information that is communicated. The idea of reading comprehension is also about finding and grasping the information contained in the reading texts. Reading comprehension is also aimed at capturing important points to remember which will affect to the thinking ability and create satisfaction of being able to understand the given material. Reading comprehension is vital because failure occurs when one learns to listen or to read but still has a problem to understand what is read and heard. They are found to be failing at performing the action and understanding of the perspective of the languages or what is being

learned. The end product of learning is an understanding, therefore, having no understanding result in a minimum result achieved.

### *B. The Purpose of Reading Comprehension*

Rivers and Temperley [6], Blanton, Anderson [7], [8] stated that there are several purposes of reading : some of them are for (a) the pleasure; (b) practicing the reading aloud; (c) renewing existing knowledge; (e) associating existing information with the new information; (f) obtaining information for oral or written reports; (g) confirming or rejecting predictions; (h) displaying an experiment or applying the information obtained from a text and learning about the structure of the text; and (i) answering to specific questions.

Turner [7] reveals that some successful indicators for a good reader are said to not only understand the material but also when they can: (1) be acquainted with the words or phrases found in the text, (2) associate their personal existing experience to the sphere of text (3) to understand the contextual meaning, and (4) to be able to make a value judgment based on the contents reading.

### *C. The Sense of Critical Thinking*

Apart from being a skill, Critical thinking is also deemed as a way of thinking in order to assess an explanation made by others. The notion of critical thinking is also making an argument or opinion of a particular motion. Thus the opinion making is a stance of making a reasonable rationale or commentaries which somehow is on the basis of personal preferences and individual description. This is contrasting to the previous opinion which argues that critical thinking is simply aiming for what should be done but it is also more into having a stance and explanation. [10], [11], [12], [13].

Iakoyos also argues that "critical thinking ability is required to evaluate the quality of information." The opinion does not always aim at changing things but also reinforcing the previous opinion. Critical thinking skill is needed to assess or evaluate some information particularly on filtering out other opinions. Critical thinking is not only included on the mental processes that people use to solve a problem or make a decision, this is obviously a skill or a responsibility for the thinking to perform self-correcting and is a sensible tool to context. [14] [16] [17][18].

### *D. Indicator of Critical Thinking*

Critical thinking ability can be improved through the learning process. This means that, learning does not only improve cognitive ability for a particular subject, but also improve students' critical thinking ability. There are several elements that are important

in critical thinking to be learned by students such as identifying issues

- identifying relationships between elements
- deducing implications.
- inferring motives
- combining independent elements to create new patterns of thought (creativity)
- making original interpretations [19][20].

Critical thinking involves logical and systematical thinking and follows the rules of scientific reasoning [12]. The characteristics of critical thinkers are as follows 1) understand the logical relationship between ideas. 2) formulate an idea briefly and precisely. 3) identify, develop, and evaluate arguments. 4) evaluate the pros and cons of a decision. 5) evaluate the evidence for a hypothesis. 6) detect inconsistencies and common errors in reasoning. 7) analyze problems systematically. 8) identify the relevance and importance of the ideas. 9) provide a reason of a belief and value. 10) reflect and evaluate one's stance in thinking [12].

### *E. The Sense of DRTA*

Directed Reading Thinking Activity (DRTA) is a reading strategy. which engages the reader to use his experience to build on the ideas of the author. This activity can be used in every level of reader either in group or individual. The material can also be in form of a text of the story or explanation. DRTA occurs when readers getting absorbed into the activities of thinking and reading about a predicted message. DRTA is also considered as a teaching plan that directs readers to engage in the reading material and to stimulate their thinking particularly on making predictions of the reading content [21] [22] [23].

Stauffer described that as a learning strategy, DRTA is focusing on the involvement of students in the text predictions during a reading activity. Stauffer also further explained that the teachers could motivate effort and concentration of students by engaging them intellectually as well as encouraging them to formulate questions and hypotheses, process information, and evaluate a temporary solution [8].

### *F. The Purpose of DRTA*

DRTA emphasizes the activities of thinking at the time of reading. Children are trained to inspect, create hypotheses, find evidence, suspend judgment, and to take decisions based on experience and knowledge. These activities can be implemented both in the groupwork and individual. DRTA can be implemented by using a problem-solving approach. Beck and McKeown stated that the materials used can be either a fictional or non-fictional texts. The objectives of this strategy include:

- 1) development of students' understanding. Basic skills practice activities that include discussions, further reading, and writing.

- 2) the development of reading goals. The purpose of reading differs from an individual to other groups and is determined by experience, intelligence, language knowledge, interests, and students' needs
- 3) the adjustments between reading speed and the reading goals which is in line to the difficulty level of the material. The adjustment will result differently depending on the type of reading.
- 4) Observation readings. These observations include the ability to pay attention to the reading activities which is adjusted to the reading speed, reading difficulties, and the need to reread[24].

The purpose of the DRTA method is to develop students' ability to read critically and reflectively. This method is also selected by many teachers as it equips readers:

1. to determine purposes for reading
2. to extract, comprehend and assimilate information
3. to examine reading materials based upon purposes for reading
4. to suspend judgments
5. to make decisions based upon information gleaned from reading[25].

#### *G. The stages of the learning strategy of DRTA*

Stauffer mentioned that Directed Reading Thinking Activity (DRTA) stressed the importance of the use of prediction during reading to lift the supervision of students about their understanding during the time of the briefing lesson. Stauffer also describes the three stages of Directed Reading Thinking Activity (DRTA) namely: predicting reading and proving. Overall, these three stages involve the interaction of students and teachers in regard to the reading content. The following are some detailed explanations regarding the steps or stages of Directed Reading Thinking Activity (DRTA)[26].

- 1) Predict, in the first step, the teacher prepares students to read and help them think about what they will be read before starting the study. Students learn to predict what they will read based on guidelines that are available in the text, such as images, highlighted paragraphs/sentences as well as the overview section. During this step, the role of the teacher is to ask the students about their predictions. This is the time to guess, anticipate and predict.
- 2) Read, the next step is to read. Students are required to do silent reading of the text and asked to verify the accuracy of their predictions. Some of their predictions may be rejected and some will be accepted after the further reading. There are no right or wrong predictions, The predictions are valued if they are less accuracy than the others.
- 3) Prove, during this step, the students read the text so that they can verify their predictions. Students will be asked to verify the accuracy of their

predictions by finding the statements in the text and reads it orally in the class. Teachers will act as mentors whose role is to help students to filter and deepen their understanding to the text and thinking skills. This step has been developed during the previous stages, where students make predictions and read to find evidence. In this step, students will confirm or revise their prediction [8]

#### *H. The sense of Problem Based Learning*

The problem based learning is one of the modern teaching methods which allows each student to build their own knowledge of the schemes. This can be done by applying a model of problem based learning. Problem based learning is an approach to learning in which students worked together in small groups, discuss the issue of subject matter, investigate and learn together to develop knowledge and understanding in a particular situation. Students are encouraged to make opinion which aim is to see the stage of their understanding to the learning material. This can be carried out by the activities of investigation where students will acquire new knowledge[27,28,29].

The problem based learning model is aimed to make students active, creative, innovative, and affective in building the scheme of collective knowledge through the unification of ideas and previous knowledge. This means that the problem based is not only on the acquisition of learning knowledge declaratively, but also on the acquisition of procedural knowledge where students are triggered to solve problems in an authentic manner. This will also mold their integrative characters, thus, create an opportunity for teacher to educate their students' mental as well.

#### *I. The Purpose of Problem Based Learning*

In problem-based approach, complex and real world problems are used to motivate students to identify and examine the concept and the principles that they need to know. For work through the problem will be brought to small learning teams, aiming to gain collective abilities and to communicate and integrate information. Other skills also include the following: (a) critical thinking and being able to analyze and resolve complex and real world problems; (b) Being able to find, evaluate, and use appropriate learning resources; (c) Being able to work in the same team and small groups; (d) The skill to demonstrate communication skills that is flexible effective, and interpretive; (e) The skill to use the content knowledge and obtain intelligence[30], [31]. All of these activities can be done through the application of the model of problem based learning. The purpose of the application of problem based learning is when teachers implement approaches and students were given motivation and encouraged to ask

questions, to generate empirical data, and to formulate theory and hypothesis as well as to describe a situation which is still confusing [34]. Discussion activities will be conducted by teacher to help students realize their own reasoning processes. Students are also taught to monitor and evaluate their own learning strategies. So, the purpose of problem based learning models can make the students to get accustomed to the process of reasoning and being able to take a stance and action in a perplexing situation is.

J. The steps of Problem Based Learning

The process of problem based learning consists of two activities; activities performed by teachers and also students during the learning process. Description of the activities of learning problem created in a table as follows:

TABLE I. STEP OF PBL

	What Students Are Doing	What the Instructor Is Doing
1	Pre-case quiz (Blackboard) Ask with patient questions	Patient case presentation
2	Case work-up	Facilitate discussing within groups
3	Ask additional questions, if necessary	Answer questions
4	Post-case quiz (Blackboard)	Mini-lecture
5	Case presentation and discussion	

A description of what is meant by Marsha in the table gives an overview of the learning process[33]. There are five steps in applying approaches problem based learning. The fifth step is as follows:

- 1) First, Students are given a topic before starting the quiz,, which gives have basic questions before learning the subject matter.
- 2) Secondly, teachers divide students in groups. No one will work alone. Students will start to do an initial discussion in groups, so if there are any questions, teachers will point out some students in each group to answer the question. 3) Thirdly, the students will remain in the group, but the teacher will trigger student by giving them more guiding questions which aims to provoke students to develop the required skills.
- 3) The teacher will continue to. give students questions within the group. The role of the teachers = is to motivate students to cooperate an to give the answer of the question.
- 4) Finally, student will be asked to present the results of the discussion. This discussion is about the initial guiding questions and other additional questions given by the teacher. All questions have actually been addressed in their respective groups in the fourth phase.

III. MATERIAL & METHODOLOGY

A. Data

This research was carried out in SD Negeri Ngadirojo 4 and SD Negeri 3 Ngadirojo in 2016/2017

academic year. This research was carried out on 16 January 2017 to January 21, 2017. The population in this research was the whole grade V SD Ngadirojo, Kidul Subdistrict in 2016/2017 academic year. In this study, sampling was performed using cluster random sampling techniques. The mechanism of cluster random sampling in selecting a sample is not based on the individual, but rather is based on the group (class). Data about the students' skills of reading comprehension and critical thinking was obtained from the results of pre-and post-test. Pre-test was used to measure the students' ability of the early intermediate reading comprehension and critical thinking before given the treatment, whereas post-test was used to measure the ability of reading comprehension skills and students' final critical thinking after being given the treatment.

B. Method

This research employed quantitative research using artificial experiments (quasi experiment). The design used in this study was "pre-test and post-test nonequivalent control group design. The following is the stages of research design on "pre-test-post-test nonequivalent control group design";

- 1) The initial tests (Pretest)
- 2) Treatment
- 3) Observations
- 4) The ultimate test (Posttest)
- 5) Assessment

C. Test Assumption A Prerequisite

- 1) Test of normality univariate

TABLE II. TEST OF NORMALITY

Description	Class eksperiment of I PBL learning	Class eksperiment of II DRTA learning
	value of significance	Value of significance <sub>e</sub>
Reading comprehension ability	0,166	0,091
Critical thinking ability	0,456	0,276
Conclusion	Normal	Normal

- 2) Test of normality multivariate

TABLE III. TEST OF NORMALITY

Description	Class eksperiment I with PBL learning	Class eksperiment II with DRTA learning
Coeffisien correlation	0,789	0,862
signification	0,000	0,000
conclusion	Normal	Normal



3) Test of homogeneity univariate

TABLE IV. TEST OF HOMOGENITY

Description	F	df1	df2	Signification	Conclusion
Reading comprehension ability	0,051	1	38	0,823	homogen
Critical thinking ability	1,304	1	38	0,261	homogen

4) Test of homogeneity multivariate

TABLE V. TEST OF HOMOGENITY

Box's M	3,004
F	0,944
df1	3
df2	259920,000
Signification	0,418
Conclusion	homogen

IV. RESULTS AND DISCUSSION

A. Result

1) The difference in the effectiveness of these two types of learning; DRTA and PBL on the ability of reading comprehension and critical thinking ability of students of class V SD -Ngadirojo Kidul Subdistrict are shown in the following;

TABLE VI. TEST OF MANOVA

Description	coefisient	F	signification
Type of learning	Pillai's Trace	4,485	0,018
	Wilks' Lambda	4,485	0,018
	Hotelling's Trace	4,485	0,018
	Roy's Largest Root	4,485	0,018

Based on the table above, after the fourth of MANOVA test coefficient used their significance value of 0.018. This means that through the simultaneous analysis, two variables in the test the ability of reading comprehension and critical thinking skills are reviewed by both types of learning DRTA and PBL in order to indentify the differences.

2) The following is the results of the test T-Independent The difference in the effectiveness of learning usinh DRTA and PBL in terms of the ability of reading comprehension of grade V SD Sub Ngadirojo Kidul..

TABLE VII. INDEPENDENT T-TEST

	Learning	N	Mean	Standar deviasi
Reading comprehension ability	DRTA	20	7,6250	0,63609
	PBL	20	7,0750	0,91083
	Df	38		
	Value of T test	2,214		
	signification	0,033		
	Different of mean	0,55000		

Based on the table then it can be inferred that

there is a difference between the effectiveness of learning DRTA and PBL in terms of the ability of reading comprehension of students in grade V of. From the results of the table, it can be seen that the average difference between the two groups is 0.55. This shows that that the average classroom learning with DRTA is better than the average classroom learning with PBL. In terms of the ability of reading comprehension in grade V of SD Ngadirojo Kidul Subdistrict , DRTA learning is more effective when compared to the PBL learning in terms of enhancing understanding of the reading comprehension.

3) The effectiveness difference in the of learning of DRTA and PBL in terms of critical thinking skill of students in grade V of SD -Ngadirojo Kidul Subdistrict

TABLE VIII. INDEPENDENT T-TEST

	Learning	N	Mean	Standar deviation
Critical thinking ability	DRTA	20	8,033	0, 65626
	PBL	20	7,467	0, 92169
	Df	38		
	T-test	2,237		
	Signification	0, 031		
	Different mean	0, 25300		

Based on the table above it can be concluded that there is a difference in the effectiveness of learning between DRTA and PBL on the critical thinking ability of students of class V SD Ngadirojo Kidul Subdistrict. The average difference between the class is 0.566. This average experimental of class 1 is greater than the average classroom of experiment 2. The average difference of the DRTA shows that this type of learning is more effective in improving critical thinking ability of students of class V SD Ngadirojo Kidul Subdistrict compared to the result obtained from learning with PBL.

B. Discussion

There is a difference between the two classes is the difference in the use of the learning strategy that have been implemented namely problem based learning (PBL) and directed learning Reading Thinking Activity ( DRTA). In addition, there are still many teacherwho cannot act as a role of facilitator in helping students to direct and guide the students. Tthis is a concern because students are unfamiliar with of the process of learning collaborating DRTA and PBL so students need time to adapt.

Another possibility is both approaches emphasize collaboration and discussions between members of the group. So that, in its application group of students who are alike seem to be actively interacting, exchanging information and knowledge. This occurred as there is aninformation and experience similarly construed among them.

Learning with problem-based approaches (PBL) is found to be effective particularly in reviewing students' critical thinking. the Results obtained

through a series of activities in the PBL has shown that it encouraged students to construct the experience so that students better understand what they learnt. It also has an effect on critical thinking ability of the students. Problem-based approaches learning (PBL) can help students whose critical thinking ability is low. It is in accordance to the research conducted by Fatade, Mogari. Arigbabu (2013) and Farlian, m. Retnawati, h. & (2011).

But test results of one sample t-test showed that the value of T is 2.237 to aspects of critical thinking ability and significance with 0.031. These results showed that Directed Reading Thinking Activity (DRTA) is more effective than Problem Based Learning (PBL) particularly to the aspects of critical thinking ability. This is because in a directed Reading Thinking Activity (DRTA) students are required to predict based on the readings given by the teacher. It requires students to think critically as well. Directed reading thinking activity (DRTA) puts more emphasis on reading comprehension activities and predicting activity so the students are stimulated to think critically and to result in the effectiveness of critical thinking skill.

Reserved matters are given according to the material used in the study. This type of learning process have taught students to reflect on their understanding of a problem. Critical thinking ability of students in understanding discourse a problem obviously varies. real problems that exist in the Directed Reading Thinking Activity (DRTA help students to learn the basic ideas of understanding a problem

In terms of the ability of reading comprehension of students learning DRTA has experienced benefits to increase students' ability. It is because they got a strategy where the to teach students to understand the readings. The use of directed Reading Thinking Activity (DRTA) in learning reading comprehension develop students' ability to understand a text. Students will be more ready to understand the text because students are taught not only to directly to the content of the readings. Learning with Directed Reading Thinking Activity (DRTA) have taught students to be more successful in the reading comprehension[3][9].

Results of the study on the experimental group showed that the use of DRTA has provided benefits to students in learning reading comprehension which increases the score on the final test (posttest) particularly to the experimental group 1 students. The benefits that include to the students in the experimental group who have been assisted to find problems on the readings. Other benefits that occurred to the student is when they tried to help other students to dig. Stages of learning activities used in a directed Reading strategies has heled students to achieve a deep understanding of the content. Apart from the

aforementioned benefits, DRTA strategy has also shown positive trend to (a) stimulate students to think before reading; (b) stimulate students to recall their knowledge before reading; (c) prepare students before reading the content; (d) trigger the students to make predictions based on the knowledge of the topic being read; (e) to assess the knowledge of students about an object related to the reading material; and (f) to focus students concentraion in order to find information.

Making predictions has triggered students to apply metacognition skills, because students think in accordance to their own thought. Metacognition refers to the intellectual knowledge which stems from individuals' own thoughts and consciousness. This statement indicates and concludes the current study that there is a significant difference on students' understanding of reading skills between using self-directed reading and without the use of Self-directed learning reading. This suggests that the purpose of this research has been reached.

## V. CONCLUSION

There is a difference in the effectiveness of the use of the strategy of Direct Reading Thinking Activity (DRTA) with the use of learning reading skills and PBL comprehension to students' critical thinking of class V SD Ngadirojo Kidul.

Direct Reading Thinking Activity (DRTA) is found to be more effective compared to the use of learning reading comprehension skills using PBL for the students classes V SD sNgadirojo Kidul Subdistrict particularly towards students' critical thinking skills in class V SD -Ngadirojo Kidul Subdistrict

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