The Effect of Applying Metacognitive Strategy to Improve Students' Ability in Reading Comprehension

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Abstract: *This research was aimed to find out the effect of applying metacognitive strategy to improve students' ability in reading comprehension on the eleventh grade students in SMA N 2 Pematangsiantar. It was quasi-experimental design which the population of the research was all students on the eleventh grade in SMA N 2 Pematangsiantar. By using cluster random sampling technique, two classes were chosen as sample of the research, they were class XI PMIA 2 as experimental group and XI PMIA as control group. It was started with pre-test of both experimental and control group, treatment in experimental group and last conducted post-test of both groups. The instrument of the research was reading comprehension test which was multiple choice tests and consisted of 30 question items. The validity and reliability of test were analyzed by using SPSS 22. The last result was independent sample t-test to analyze whether there is effect of applying metacognitive strategy to improve students' ability in reading comprehension or not. After doing research, the result of post-test mean of experimental group is 80.28 with standard deviation is 10.355 and post-test mean of control group is 67.63 with standard deviation is 8.353. From the post-test result, it stated that sample was distributed normally and had homogeneous variance. With the degree of freedom (df) is 78 and level of significance is 5 % (0.05), from t-test result which is higher than t-table, where value of* t_0 *is 6.013 >* t_t *is 1.665, it can be concluded that there is significant effect of applying metacognitive strategy to improve students' ability in reading comprehension on the eleventh grade students of SMA N 2 Pematangsiantar.*

Keywords: *Comprehension, reading, metacognitive strategies*

I. INTRODUCTION

The development of education in the world requires every country to have curriculum that supports English as one of languages to be learned. In Indonesia, curriculum has been altered several times adapting the progress of education in the world. Nowadays, Indonesia implements the newest curriculum called K-13 (Kurikulum 2013) or 2013 Curriculum which has been implemented in most regions. Permendikbud No. 59 Tahun 2014: 1 established that "curriculum which has been implemented in all senior high schools since academic year of 2013/ 2014 is mentioned as 2013 Curriculum of Senior High School". One of lesson which has to be learned and taught in all grades of school, from primary up to senior high school is English. English as an international language is one of important languages to learn because it can be used to communicate, get knowledge or information among people from many countries in the world. English fluency in both oral and written forms is also needed in educational field or for language mastery. Therefore, mastering English is one of important duties which the teacher must teach in the school. There are four skills that should be mastered in English. As Elmadwi & Shepherd

(2014:29) stated that "Learners need the four skills that are listening, speaking, reading, and writing. But of all these four skills, reading plays a vital role for students in the classroom". In addition, Dechant cited in Hamra & Syatriana (2012: 2) stated that "Reading as a process of decoding where students are trained to pronounce the printed words, and to find meaning where the focus of reading is for comprehension or reading for comprehension". Reading for comprehension involves the relationship between meaning and word symbol, the choice of appropriate meaning based on the context, the organization of meaning, and the ability to give arguments and catch ideas. Meanwhile, Dallmann et al., Harris & Sipay, Smith & Robinson cited in Hamra & Syatriana (2012: 2) argued that "Reading which means comprehension is actually a process of thinking to get appropriate meaning. Our ability to understand what we read is highly dependent upon the background knowledge that we bring to the act of reading". How the readers can maximize their ability in comprehending the text is very important in this case.

On the other hand, in education system of Indonesia, there is mark determination of each lesson which is known as KKM (*Kriteria Ketuntasan Minimal*) or Minimum Completeness Criteria. It is implemented by all schools from primary up to senior high school. KKM or Minimum Completeness Criteria is usually determined by teachers in the school, especially in SMA N 2 Pematangsiantar and its KKM is 70 for every student on grade eleven. But the reality indicates that most students have low mark. It means that most of them failed to achieve average mark. The researcher found some problems which caused the students cannot achieve average mark which has been determined by the teacher. The students had low proficiency in reading comprehension. The problems related to the students, the learning materials, and the teaching technique. It was proven through the writer's observation, the students' mark of English Reading was under the Minimum Completeness Criteria (KKM). The list of score observed by the researcher in this school can be shown through the table below:

Table 1. English Semester Data of SMA N 2 Pematangsiantar on the Eleventh Grade Students

No	**Year of Study**		**The scores Average**				**Mean**	**KKM**
			Reading	**Writing**	**Listening**	**Speaking**		
1	2016/ 2017	Semester I	68,45	67,82	68,08	68,53	68,22	70
		Semester II	69,16	68,67	69,47	70,26	69,39	70
2	2017/ 2018	Semester I	69,73	70,74	67,05	70,61	69,53	70

(source: Semester data of students result in SMA N 2 Pematangsiantar 2017)

Therefore, the researcher suggested one of the techniques that the teacher could use in such learning activity, that was Metacognitive Strategy. In metacognitive strategy, the teacher should teach not only how to use strategies, but rather when and why strategies are used in certain learning contexts. This strategy needs students' cognitive view to achieve the target of learning. According to Flavell cited in Cubukcu (2008: 1), "Metacognitive knowledge is one's knowledge concerning one's own cognitive processes and products or anything related to them,

e.g., the learning-relevant properties of information or data". As Woofolk cited in Philip & Tan (2006: 3) stated that "The cognitive view of learning is that it is an active mental process of acquiring, remembering, and using knowledge". Woolfolk elaborated that in a cognitive view of learning, readers are active processors of information who seek out information to solve problems and reorganize what they already know to achieve new learning, through the use of learning strategies.

In addition, Sheorey and Mokhtari cited in Philip & Tan (2006: 4) suggested that "A reader's metacognitive knowledge about reading includes an awareness of a variety of reading strategies and that reading is influenced by this metacognitive awareness". They believed that metacognitive knowledge is the combination of conscious awareness of the strategic reading processes and the actual utilization of reading strategies that distinguishes the skilled from unskilled readers. Metacognition includes assessing the requirements of the problem, constructing a solution plan, selecting an appropriate solution strategy, monitoring progress towards the goal, and modifying the solution when necessary. Finally, the researcher focused the study about the effect of applying metacognitive strategy to improve students' ability in reading comprehension on the eleventh grade students of SMA N 2 Pematangsiantar.

II. THEORETICAL REVIEW

2.1. Reading Comprehension

Dechant cited in Hamra & Syatriana (2012:2) defined "reading as a process of decoding where students are trained to pronounce the printed words, and to find meaning where the focus of reading is for comprehension or reading for comprehension". Reading for comprehension involves the relationship between meaning and word symbol, the choice of appropriate meaning based on the context, the organization of meaning, and the ability to give arguments and catch ideas. Meanwhile, Dallmann et al., Harris & Sipay, Smith & Robinson cited in Hamra & Syatriana (2012: 2) argued that "reading which means comprehension is actually a process of thinking to get appropriate meaning. Finally, based on Collins English Dictionary (2017) "reading comprehension is defined as a text that students use to help them improve their reading skills, by reading it and answering questions relating to the text".

From definition above reading comprehension can be defined as process in which the readers construct meaning from a text connected to the background knowledge they have to get the clear understanding of the writer's message.

2.2. Levels of Reading Comprehension

There are three levels of reading comprehension (Lapp & Flood cited in Hamra & Syatriana, 2012: 2), as follows :

a. Literal Comprehension/ Reading on the Line
   Literal comprehension is an understanding the ideas and information explicitly state in the passage.
b. Inferential Comprehension/ Reading between the Lines
   Inferential comprehension is an understanding of ideas and information not explicitly stated in the passage.

c. Critical Comprehension/ Reading beyond the Lines
Critical comprehension includes analyzing, evaluating, and personally reacting to information presented in the passage.

2.3 Metacognitive Strategy

a. Definition of Metacognition

Metacognition was first defined by Flavell cited in Cubukcu (2008: 1) as "knowledge that takes as its object or regulates any aspect of any cognitive endeavor". Metacognition refers to the ability to reflect on their own thinking and use of strategies to overcome learning difficulties. In other words, it is a cognitive process where one is aware of his or her own thinking.

Brown cited in Sonleitner (2001: 17) specifically defined "Metacognition and its relationship to reading as evaluation of the comprehension process while reading and ability to take action when comprehension fails." Students know very well regarding their thinking, including awareness, conscious thought and reasoning. Metacognition is important in reading because it helps readers keep comprehension processing and realise what they can do.

b. Components of Metacognition

Metacognition is classified into 3 components:

1) Metacognitive Knowledge or Metacognitive Awareness

It is what individuals know about themselves and others as cognitive processes, knowledge that can be used to control cognitive processes. Dantonio & Beisenherz cited in Stuever (2006: 8) stated "Cognitive psychologists refer to metacognition as consisting of three types of knowledge: declarative, procedural and conditional".

2) Metacognitive Regulation/ Strategies

Jayapraba (2013: 165-166) stated "Metacognitive strategies are designed to monitor cognitive process". Metacognitive strategies are ordered processes used to control one's own cognitive activities and to ensure that a cognitive goal has been met. It is the regulation of cognition and learning experiences through a set of activities that help people control their learning.

3) Metacognitive Experiences

Flavell cited in Larkin (2010: 12) stated "Metacognitive experiences may be fleeting, e.g. feeling puzzled for a moment or may be longer lasting, e.g. when you think hard about whether or not you really understand something". Metacognitive experiences can occur at any time and may be related to your progress towards a goal or may be more related to metacognitive knowledge.

c. Types of Metacognitive Strategy

Metacognitive strategy used to aid reading comprehension can be divided into three types: planning strategies (P), monitoring strategies (M), and evaluation strategies (E) (Pressley & Afflerbach cited in Israel (2007: 6-7). This metacognitive reading framework should be familiar to teachers who integrate before-, during-, and after-reading processes when teaching students effective comprehension strategies.

1) Planning Strategies

Planning strategies are metacognitive strategies that the reader does early on in the reading process—before reading—to increase reading comprehension. The following planning strategies are utilized by metacognitive readers **before** reading:

a. Activating Prior Knowledge
b. Overviewing Information in the Text
c. Relating Text-to-Text
d. Relating Text-to-Self

2) Monitoring Strategies

Monitoring strategies—usually occurring during the reading of a text—help the reader pay attention to meaning construction as well as correct breakdowns in comprehension. The following monitoring strategies are utilized by metacognitive readers during reading:

a. Determining Word Meaning
b. Questioning
c. Reflecting
d. Monitoring
e. Summarizing
f. Looking for Important Information

3) Evaluating Strategies

Evaluation strategies—used after reading—allow the reader to think critically about the text and make a cognitive or affective judgment. The following evaluating strategies are utilized by metacognitive readers after reading:

a. Thinking Like the Author
b. Evaluating the Text
c. Anticipating Use of Knowledge

2.4. Relevant Studies

The researcher sorts 3 previous studies related to the use of metacognitive knowledge in reading comprehension to support next research. The first is a research which was conducted by Bromeley Philip & Tan Kim Hua (2006) in their journal entitled Metacognitive Strategy Instruction (MSI) for Reading : Co-regulation of Cognition. Philip & Tan (2006: 20) stated that "Metacognitive Strategy Instruction (MSI) provides not only instruction in strategies, but also a learning space where learners can actually experiment using the strategies in real academic contexts". Their research finding showed that HP (High Proficient) learners in their text-processing process, seemed to indicate a strong sense of metacognitive awareness, manifestations of strategic behaviours, traits of a metacognitively sophisticated reader, and ultimately characteristics of autonomous strategic readers/learners.

The second is a research which was conducted by Kendra M. Benedict (2012) in his journal entitled Instruction in Metacognitive Strategies to Increase Deaf and Hard of Hearing Students' Reading Comprehension. This study investigated the effect of instruction in a metacognitive strategy on reading behavior and reading comprehension for D/HH students in grades four and five. Students A & B both showed decreases in non-strategic reading behavior, and increases in strategic reading behavior and reading comprehension. Treatment integrity data showed that the intervention was implemented with the highest degree of integrity for Students A and B. Student C showed increases in strategic reading behavior, but not in reading comprehension.

The last research was conducted by Mansoor Ahmed Channa & Zaimuariffudin Shukri Nordin (2014) in their journal entitled Identifying Metacognitive Strategies through Learners'

Reading Comprehension : A Review of Related Studies. The main objective of this research was to judge whether teaching metacognitive strategies to students would benefit in developing metacognitive knowledge of students at all levels means from primary level to undergraduate and graduate levels, and would work in improving the comprehension levels of students in all fields as well. Their research findings (Channa & Nordin, 2014: 2459) showed "there are two conclusions come to the surface. First, teachers should teach metacognitive strategies, and the students should use actively for developing their reading comprehensions. Second, an increase in metacognitive knowledge leads to improvement of reading comprehension". They also revealed that teachers play pivitol role to develop reading comprehension abilities among students at all levels.

III. RESEARCH METHODOLOGY

3.1. Research Design

This research is quantitative research because it focuses on the product (result of the test) not a process. It is based on quasi-experimental design in which two groups are involved with one group receiving treatment. Two groups are a control and an experiment group. After the treatment, the test scores of two groups were compared to find out the effectiveness of the treatment in the experimental group. The researcher gave the students a pre-test to identify their prior-knowledge.

3.2. Setting and Participants

The research was conducted in SMA N 2 Pematangsiantar. It is located in Jln. Patuan Anggi No. 8 Pematangsiantar, North Sumatera, Indonesia. The population of the research was the eleventh grade students which was divided into eleven classes, distributed from XI Science 1 up to XI Science 7 and XI Social 1 up to XI Social 4 with total number of students was 400 students,. Therefore, the researcher used cluster random sampling technique and chose 2 classes as sample. Those classes were XI Science 2 as experimental group and XI Science 7 as control group.

3.3. Technique of Data Collection

The researcher collected the data in four steps, they were observation, observation, pre-test, treatment and post-test. The first, observation was done to get the information that was needed. The researcher collected the data by observing the class situation and condition in the teaching learning process. Then, the researcher applied a pre-test. It is aimed to discover the students' prior knowledge before getting any treatment. It is reading comprehension test with total questions are 30 items. It is multiple choice test. Next, the treatment was the applying of metacognitive strategy. It was only given to students in the experimental group. Meanwhile, conventional method was applied in control group. The skill was developed is reading comprehension. The last, the researcher distributed the post-test. The post-test was conducted to find out the students' achievement and their progress after giving the treatment about the use of metacognitive strategy in reading comprehension. The content of the pretest was same as the post test.

3.4. Technique of Data Analysis

To analyze the data, the researcher used Independent sample t-test was applied using SPSS version 22 to analyze possible differences in reading comprehension performance between the two groups involved in reading comprehension test.

IV. FINDING AND DISCUSSION

4.2.1 Findings

Table 2. Descriptive Statistics of Experimental Group

Group	Score	N	Minimum	Maximum	Mean	Std. Deviation
Experimental	Pre-test	40	43	87	62.52	12.637
	Post-test	40	60	97	80.27	10.355
	Valid N (listwise)	40				

Descriptive statistics table shows about test score of experimental group. From the table, it can be seen that total number of students who did the test are 40 students. There are two test which have been analyzed. The first is pre-test. In pre-test result, minimum score is 43, maximum score is 87, mean is 62.52 and std. deviation is 12.637. The second is post-test. In post-test result, minimum score is 60, maximum score is 97, mean is 80.27 and std. deviation is 10.355. So, this table presents score list briefly and clearly to show the score improvement of experimental group after having treatment. It can be seen that there is significant improvement especially mean of this group from 62.52 to be 80.27.

Table 3. Descriptive Statistics of Control Group

Group	Score	N	Minimum	Maximum	Mean	Std. Deviation
Control	Pre-test	40	43	73	56.35	6.689
	Post-test	40	57	90	67.62	8.353
	Valid N (listwise)	40				

Descriptive statistics table shows about test score of control group. From the table, it can be seen that total number of students who did the test are 40 students. There are two test which have been analyzed. The first is pre-test. In pre-test result, minimum score is 43, maximum score is 73, mean is 56.35 and std. deviation is 6.689. The second is post-test. In post-test result, minimum score is 57, maximum score is 90, mean is 67.62 and std. deviation is 8.353. So, this table presents score list briefly and clearly to show the score improvement of control group without having treatment. It can be seen that there is no significant improvement especially mean of this group is from 56.36 to be 67.62.

Table 4. Frequency Statistics of Post-Test Score in Experimental Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	60	3	7.5	7.5	7.5
	63	1	2.5	2.5	10.0
	70	5	12.5	12.5	22.5
	73	4	10.0	10.0	32.5
	77	2	5.0	5.0	37.5
	80	6	15.0	15.0	52.5
	83	5	12.5	12.5	65.0
	87	5	12.5	12.5	77.5
	90	1	2.5	2.5	80.0
	93	6	15.0	15.0	95.0
	97	2	5.0	5.0	100.0
	Total	40	100.0	100.0	

This is the frequency statistics score table of experimental group after they had treatment, only 4 students who got score lower than 70 and others got score same with or higher than 70. It means metacognitive strategy is successful to be applied in the classroom.

Table 5. Frequency Statistics of Post-test Score in Control Group

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	57	1	2.5	2.5	2.5
	60	10	25.0	25.0	27.5
	63	7	17.5	17.5	45.0
	67	10	25.0	25.0	70.0
	70	3	7.5	7.5	77.5
	73	2	5.0	5.0	82.5
	77	1	2.5	2.5	85.0
	80	3	7.5	7.5	92.5
	87	2	5.0	5.0	97.5
	90	1	2.5	2.5	100.0
	Total	40	100.0	100.0	

Meanwhile, students in control group after studying by applying conventional method, there is score improvement but not significant. Total number of students who cannot pass minimum completeness criteria is more than experimental group.

Table 6. Group Statistics of Independent Sample T-Test

	Group	N	Mean	Std. Deviation	Std. Error Mean
Score Improvement	Experimental	40	80.28	10.355	1.637
	Control	40	67.63	8.353	1.321

From this table, it can be seen that there is significant difference of experimental and control's mean. It is based on post-test score where experimental group had been given any treatment and control group had studied by using conventional method. Experimental group has higher mean than control group and its mean is higher than minimum completeness criteria.

Table 7. The Result of Variance Homogenity Test

		Levene's Test for Equality of Variances	
		F	Sig.
Score Improvement	Equal variances assumed	2.609	.110
	Equal variances not assumed		

In this table, it can be seen that significance value (Sig.) is 0.110. To identify whether the variance of test result is homogeneous or not, F and Sig. value must be higher than 0.05 (level of significance). F value is 2.609 > 0.05 and Sig. value is 0.110 > 0.05. Based on the result of F and Sig. value which are higher than level of significance (0.05), so it can be interpreted that both samples (experimental and control group) have homogeneous variance.

4.2.2 The Result of T-Test

Because two groups have homogeneous variance, so value that is used is t and Sig. (2-tailed) in line **Equal variances assumed**. For value of t is compared with t-table in level of significance is 5 % (0.05) and degree of freedom (df). The calculation of ttable is df = N – 2. Because total students of two groups is 80, so df = 80 – 2 = 78, it can be seen in df coloumn. In table Distribution of ttable Value, in line df = 78, significance of t0.05, the value of ttable is 1.665.

Table 7. The Result of T-Test

	t-test for Equality of Means					
	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference

							Lower	Upper
Improvement Score	Equal variances assumed	6.013	78	.000	12.650	2.104	8.462	16.838
	Equal variances not assumed	6.013	74.658	.000	12.650	2.104	8.459	16.841

To identify there is effect of strategy used in the group, there must be the improvement score of experimental group which is higher than control group. It can be seen from t and Sig. (2-tailed) coloumn in line Equal variances assumed. The calculation of t should be higher than t-table meanwhile Sig. (2-tailed) value should be lower than level of significance (0.05).

After analyzing data, there are two result of Independent Sample t-test data output. The first, the value of t > ttable = 6.013 > 1.665. The second, Sig. (2-tailed) value < 0.05 = 0.000 < 0.05. It can be concluded that there is significant means difference of experimental and control group. It means that there is significant effect of using metacognitive strategy in reading comprehension.

4.2.3 Discussion

The researcher had conducted the research and analyzed the data. All data which are analyzed by using SPSS 22 software are presented in table form as the output of analysis. After analyzing the data, the researcher found the effect of applying metacognitive strategy to improve students' ability in reading comprehension on the eleventh grade students in SMA N 2 Pematangsiantar. This strategy was useful to be applied in the classroom. The students could improve their reading comprehension ability by applying three types of metacognitive strategy. This strategy helped improving their ability of thinking significantly. The students became more concentrated and calm in teaching-learning process because this strategy made them to do anything individually and focus on what they are learning. The strategy which was applied in the classroom helped the students to think more critically and use time on doing test appropriately.

Next, three previous relevant studies related to the applying metacognitive strategy which became proponent materials of this research were enough to prove that the research of applying metacognitive strategy to improve students' ability in reading comprehension on the eleventh grade students in SMA N 2 Pematangsiantar was successful to be conducted. There was significant effect after applying metacognitive strategy to the students in experimental group. It can be seen from students' improvement score and total number of students who passed Minimum Completeness Criteria between experimental and control group. The students in experimental group became more aware of what they are reading to get the meaning of the text. The students were also more calm because they understand to make this strategy to be successful they have to concentrate individually and try to not disturb other students.

V. CONCLUSION

After conducting the research, collecting and analyzing the data, the researcher gets two conclusions. The first, the effect of applying metacognitive strategy is significant to improve students' ability in reading comprehension on the eleventh grade students in SMA N 2 Pematangsiantar. It is shown from pre-test and post-test score table of experimental group which significantly increase rather than in control group. The second, there is no significant effect without applying metacognitive strategy in control group, by using conventional method the researcher find that it cannot increase students' ability in reading comprehension significantly. It is shown from students' pre-test and post-test score table of control group which not significantly increase rather than in experimental group.

The result of this research shows that the applying of metacognitive strategy can improve students' ability in reading comprehension. Therefore, the researcher gives the suggestions to the English teacher and students.

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