

THE EFFECTIVENESS OF JIGSAW IN IMPROVING STUDENTS' READING COMPREHENSION

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First Received: 4 January 2017

Accepted: 25 January 2017

Final Proof Received: 25 April 2017

Published: 29 April 2017

Abstract

This research aims at investigating the effectiveness of Jigsaw in teaching reading comprehension, and it also aimed to investigate the students' responses toward the Jigsaw technique. An English teacher and 30 seventh graders were involved as participants in this research. The data were obtained through classroom observation, giving treatments, and questionnaires. The data obtained from pre-test and post-test were analyzed by using SPSS 20 and ANATES V4 for windows. The data analysis from the independent t-test showed that there was significant difference in the result of post-test means between the experimental and the control groups. It showed that the score of the experimental group ($M=24$) was higher than control group ($M=19$). Furthermore, based on the result of the dependent t-test showed that t_{obt} was greater than t_{crit} ($8.976 > 2.064$) at the level of significance 0,05 indicating that the null hypothesis (H_0) was rejected. It means that there was a significant difference between students' pre-test and post-test of experimental group after the treatments. The results of the study revealed that Jigsaw could be applied effectively to teach reading comprehension. Students were eager to discuss the information included in the descriptive texts one to another. In addition, the study also showed that the majority of students showed their interest in learning reading comprehension through Jigsaw. The results of the research indicated that using Jigsaw to teach reading comprehension made students tend to be active during the teaching and learning process, and it improved their comprehension about the descriptive texts.

Keywords: teaching reading comprehension; jigsaw; young learners

INTRODUCTION

As an international language, English has been learnt by people around the world. According to Crystal (2003), English has become global language because it is widely used by the people in the world for the subject matters learned by students. It is given in some educational level such as elementary, intermediate, and upper intermediate level. It seems that learning English is a must for people to face this globalization era. Since English has dominated almost every aspect in our lives, such as technology, commerce, and education.

In learning English, there are four skills that should be possessed such as listening, speaking, reading, and writing. One of those skills that is important to master is reading skill (Clarke and Silberstein, 1997 cited in Brown,

2001). This importance comes since reading provides useful information, knowledge, experiences and cultural aspects to readers through texts. However, teaching English, particularly teaching reading comprehension, seems to be more difficult than teaching Indonesian language, since English has different language features. These differences may cause problems to learners. Therefore, teachers who teach a foreign language or a second language must possess methods and techniques to assist learners during teaching-learning process. According to Chai (2005), a teacher has the opportunity to "teach less, learn more". She argues that teaching is not just delivering the knowledge, but it is about communicating. She also adds that communicating is not only between the

students with the teacher, but also the students with students.

There are many teaching strategies in teaching English. One of them is cooperative learning strategy. As Johnson, Johnson, and Holobec (2008); Slavin (2005) state that;

Cooperative learning makes the students more active, the students will work together and by promoting an equal opportunity for every student to participate in the activity, improving self-esteem enjoyment of school and interethnic methods are keys in this approach.

Based on the statement above, the cooperative learning strategy is appropriate to be applied in big classes with many students. The cooperative learning has several teaching techniques. According to Aronson et al (1978), one of the techniques is Jigsaw. Jigsaw is developed by Elliot Aronson and first used in 1971 in Austin, Texas. Aronson et al (1978) states that;

Jigsaw is a cooperative learning strategy that enables each student if a 'home group' to specialize in one aspect of a learning unit. Student meet each other members for other groups who are assigned the same aspect called 'expert group' and after mastering of material, return to the 'home group' and teach or explain the material to their group members. Just as in a jigsaw puzzle, each piece-each student's part is essential for the completion and full understanding of the final product. If each student's part is essential, then each student is essential. That is what makes the jigsaw strategy is so effective.

In a public school, it is common that one class consists of 35-40 students. Furthermore, the students may have different levels of understanding. Therefore, jigsaw technique is expected to facilitate students who have low capabilities to be assisted by those who have high capabilities.

The Scope of the Research

This research focused on finding out the effectiveness of jigsaw technique to improve students' reading comprehension. There were two investigated groups: a control group and an experimental group. The participants were the seventh graders in one of public junior high school in Bandung.

Theoretical Foundation

Reading is one of four language skills, and is an active process of seeking information in which readers relate information in the text to what they already know. In addition, reading is the process of looking at a series of written symbols and getting meaning from them. Reading is an exercise dominated by the eyes and the brain. When reading, readers use their eyes to receive written symbols (letters, punctuation marks and spaces), and they use their brain to encode or convert them into words, sentences and paragraphs.

According to Byrne (2004), reading is an interactive process that goes on between reader, the text and resulting in comprehension. Reading is a receptive skill - through it readers receive information. According to Grabe and Stoller (2002, p.14), reading comprehension is an ability to understand the information in a text. A process of engaging brain and eyes in making connection is text comprehension. It means the brain processes the information from what the eyes see. Mickulecky and Jeffries (1996, p.14) states that it will be easier to be connected when the information the readers get is interesting. Meanwhile, Orasanu (1986, p.32, cited in Yousef 2006, p.8) argues that the knowledge a reader brings to a text is a principal determiner of how the text will be comprehended and what may be learned and remembered. People have their own needs and purposes in reading a text so that the appropriate texts are also important things to comprehend or understand.

In terms of classification, Brown (2004) and Harmer (2007) classify reading into two classifications, academic reading and personal reading. The explanation is as follows:

1. **Academic Reading** refers to reading in which students do in the classroom such as articles, reports, journals, reference materials, textbooks, essays, papers, test directions, theses, and opinion writings.
2. **Personal Reading** refers to reading in which students do away from the classroom such as magazine, newspapers, letters, emails, greeting card, invitation, messages, notes, lists, schedules, recipes, menus, maps,

calendars, advertisements, novels, short stories, jokes, drama, poetry, financial documents, forms, questionnaires, medical reports and cartoons.

Regarding to the explanation, this study focused on academic reading. There are some genres of the text which are used in this study namely: recount text, narrative text, and descriptive text.

According to Harmer (1997: 55), there are four reasons how important reading is, those importance of reading can be concluded as follows:

1. Reading for Language Learning.

Reading is an exercise dominated by the eyes and the brain. The eyes receive message and the brain then has to work out the significance of these message. The reading to confirm expectation technique is highly motivation and successful since it interest students, creates expected, and gives them a purpose for reading.

2. Reading for Information

In most cases, reading for information is relevant to current study of the readers. They read to find out information, to reduce their uncertainties, and the get some knowledge. Reading for information is what people mostly do in their daily activities.

3. Reading for Pleasure.

Reading for pleasure is done without other people's order but according to an individual reader's wish, and taste. It aims to entertain the readers rather than to get knowledge. The reading sources for this activity are comics, short stories, novels, etc.

Based on the importances of reading above, we can find out that there several things why reading is important for our lives, reading can be used for any occasion. In real life people generally read something because they want to and they have a purpose, which is more fundamental than involved in some language

learning tasks seem only to be asking about details at language. People read to language because they have a desire to do so and a purpose to achieve.

According to Brown (2001, p.312), there is a variety of reading performance in the language classroom derived from the variety of texts to which can expose students than from the variety of overt types of performance. Those performances are listed in the following explanation.

1. Oral and Silent Reading

Oral reading serves as an evaluation check on bottom up processing skills. Oral reading also provides a purpose to minimize the disadvantage, which is; oral reading is not a very authentic language activity, while student is reading, it is possible the other can easily lose attention.

2. Intensive and Extensive Reading

As Nation (2009, p.25) states that intensive reading is the grammatical translation approach where the teacher works with the learners using the first language to explain the meaning of a text. Nation (2009, p.49) also states that extensive reading fits into meaning focused input and fluency development stranding of a course depending on the level of the books that the learners read. Sometimes the extensive reading helps the learners to get away from their tendency to look up words they do not know.

Cooperative Learning Method

Cooperative learning is sometimes called small group learning. It is supported by Lie (2008, p.18) who defines that cooperative learning allows students to work in a small group. Even cooperative learning is similar with small group, but cooperative learning is more than just small group learning. According to Olsen & Kagan (1992), cooperative learning is an organized learning activity so that the process depends on socially structured exchange of information among students in the groups. There are some differences between small group and cooperative learning. One of them is

that in cooperative learning students have different tasks and learning goals that can only be achieved if every group's member finishes their task (Lie, 2008, p.29).

According to Johnson, *et al.* (1998), there are three types of cooperative learning method. The first one is formal cooperative learning groups, which are structured, facilitated, and monitored by the educator. Any course material or assignment can be adapted to this type of learning and groups can vary from 2-6 people. Formal cooperative learning includes jigsaw, think pair share, students' team achievement division, and group investigation.

The second one is informal cooperative learning group. It is a group with passive teaching by drawing attention to material throughout the lesson or by discussion at the end of the lesson. There are some teachers who use informal cooperative learning during the lesson. Students can discuss briefly a question posted by the teacher or summarize what their teacher has just presented.

The last one is group base. Cooperative base groups are long term, heterogeneous cooperative learning groups with a stable membership, whose primary responsibility is to give each member the support, encouragement, and assistance that they need.

Jigsaw Technique

Jigsaw is developed by Elliot Aronson and was firstly used in 1971 in Austin, Texas. Aronson et al (1971) state:

Jigsaw is cooperative learning strategy that enables each students of a 'home group' to specialize in one aspect of a learning unit. Student meet with other members from other groups who are assigned the same aspect called "expert group" and after mastering the material, return to the "home group" and teach or explain the materials to their group members. Just an in a Jigsaw puzzle, each piece-each students' part – is essential for the completion and full understanding of the final product. If each student's part is essential, then each students is essential. That is what makes the Jigsaw strategy is so effective.

Jigsaw technique enables students to learn together in a group and take responsibility in

understanding the materials for each other. Spencer (1994) states:

Jigsaw is groups with five students are set up. Each group member is assigned some unique material to learn and then to teach to his group members. To help in the learning, students across the class working on the same sub-section get together to decide what is the important and how to teach it. After practice in these "expert" groups the original groups' reform and students teach each other.

Based on the description above, Jigsaw allows students to work in a team and maintain the personal responsibility. In addition, Aronson (1978) says that jigsaw helps the students develop a depth of knowledge which is impossible if they try to learn the material on their own.

According to Aronson (1978a, 1997b, 2008c), the procedures of Jigsaw technique in teaching reading comprehension are as follows:

1. Dividing students into five or six people called "home group". The groups should be divergent in terms of gender, ethnicity, ability and skill.
2. Appointing one student from each group as a leader.
3. Dividing the material into five or six segments.
4. Assigning each student to learn a segment of the material.
5. Giving students time to read over their segment at least twice and become familiar with it
6. Forming temporary "expert group" by having one student from each home group join other students assigned to the same segment. At this step, teacher must give time to these "expert groups" to discuss the main points of their segment and to rehearse the presentations they will make to their home group.
7. Bringing the students back into their home group
8. Asking each student to share the segment to the group.
9. Circulating from group to group, observing the process. If there is group having problem, for example; a

- member is dominating or disruptive, make an appropriate intervention.
10. Giving a quiz on the material to find out students' achievement.

METHOD

The purposes of this study were to find out the effectiveness and student's responses of Jigsaw technique on the reading comprehension. Therefore, this study used a quasi-experimental design. According to Hatch and Farhady (1982, p.24), a quasi-experimental design is a practical that compromises between true experimentation and the nature of human language behavior which we wish to investigate.

The study involved two groups; an experimental group and a control group. The experimental group received small group discussion method treatments while the control received conventional method. According to Jackson (2008, p.318), the quasi experimental was used for this method did not require random sampling. This research method provided the students with pre-test, treatments, and post-test in order to find out the effects of Jigsaw technique on the student's reading comprehension.

In this research, two classes were taken as the sample classes; those were labeled as the experimental group and control group. The first group (e1), the experimental group, was given a pre-test (X1), treated by using Jigsaw technique (T), and then given a post-test (X2). The second group (c1), the control group, was given a pre-test (X1), treated by using conventional teaching (O), and given a post-test (X2) (Hatch and Farhady 1982:21).

The table shows the different treatment given to each investigated class. In the experimental group, Jigsaw technique was given to the students in the learning process. On the other hand, a conventional teaching was implemented in the control group as the treatment in learning reading comprehension. Furthermore, the post-test was administered in order to investigate the result of the treatment.

The independent variable of the study was the use of jigsaw technique. Meanwhile, the dependent variable was students' reading

comprehension scores observed and measured in order to determine the effects of the independent variable (jigsaw technique). The design was adopted from Cresswell (2009, p.50).

Table 1

Group	Pre-test	Treatment	Post-test
Experimental	Xe 1	T	Xe 2
Control	Xc 1	O	Xc 2
Xe 1	: students' reading scores of experimental group on pre-test		
Xc 1	: students' reading scores of control group on pre-test		
T	: Jigsaw treatment		
O	: Non-Jigsaw treatment		
Xe 2	: students' reading scores of experimental group on post-test		
Xc 2	: students' reading scores of control group on post-test		

The participants of the study were the EFL students of one of junior high schools in Bandung. The students were at the seventh grade (15-16 years old). This study involved two classes in which each class consisted of 30 students.

Pretest and posttest were measured by using paired sample t-test. It was analyzed to find out the difference between pretest and posttest mean score whether it was significant or not by comparing their mean (mean of pretest and mean of posttest). It was calculated by using SPSS 20 for Windows. Questionnaire was conducted in order to get the information directly from the students about the learning process and their responses to the learning activity by using jigsaw technique. It was analyzed by interpreting the students' answer of the questions.

FINDINGS AND DISCUSSIONS

The Pre-Test Scores

Pre-Test was conducted in the beginning of the research to identify students' prior knowledge and to measure the students' readiness on the subject they were about to learn. The data was analyzed by Microsoft Excel to get descriptive statistical result from pre-test score in control group and experimental group.

According to the charts above it points that the mean of pre-test score of control class with 30 students is 16, maximum score is 23 and minimum score is 8 and the mean of post-test of experimental class with 30 students is 18, maximum score is 25 and minimum score is 13.

Pretest scores were obtained from the experimental group and control group before conducting the treatment. The table 4.1 below shows the highest, lowest, sum, and mean of the student's scores from the experimental and the control group in the pre-test.

Table 2 shows that the mean of the experimental group is 18, while the mean of the control group is 16. Based on the table, the mean score of the experimental group is higher than the control one. The pre-test scores must be tested for normality of distribution and homogeneity of variance before comparing the data between the experimental group and the control one by using SPSS 20.

Based on the table 3, the probability P value (Sig.) of pretest experimental group is

0.376 and the control group is 0.741 higher than the level of significance (0.05). It can be concluded that null hypothesis is accepted since the scores of experimental and the control groups are normally distributed.



Figure 1. The comparison of pre-test score in both class.

Table 4 reveals that the probability (based on mean) of the homogeneity of variance test is 0.753 which higher than the level of significance (0.05). it can be concluded that null hypothesis is accepted.; the variance of two groups are equal.

Table 2. The pre-test score

Subjects (30 students)	Experimental Group	Control Group
Highest Score	25	23
Lowest Score	13	8
Sum	540	485
Mean	18	16

Table 3. The Result of Normality Distribution Test on Pretest

		One-Sample Kolmogorov-Smirnov Test Pre Test	
		PRETEST_EKSPERIMENT	PRETEST_CONTROL
N		30	30
Normal Parameters ^{a,b}	Mean	18.00	16.17
	Std. Deviation	2.936	3.333
Most Extreme Differences	Absolute	.167	.124
	Positive	.167	.124
	Negative	-.087	-.113
Kolmogorov-Smirnov Z		.913	.682
Asymp. Sig. (2-tailed)		.376	.741

a. Test distribution is Normal.

b. Calculated from data.

Table 4. Test of Homogeneity of Variance on Pre-Test

Levene Statistic	df1	df2	Sig.
.565	6	17	.753

Table 5 Independent Samples Test

		F	Levene's Test for Equality of Variances	t-test for Equality of Means	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
Score	Equal variances assumed	.859	.358	.543	58	.000	5.36667	.82017	3.72491	7.00842
	Equal variances not assumed			.543	57.696	.000	5.36667	.82017	3.72473	7.00860

Based on the table 5 the tobt is 0.543 (the absolute of 0.543) and the degree of freedom (df) of pretest is 58. This means that the tcrit is 2.011 at the level 0.05 (based on the critical values of t at the 0.05 level to the line df =58). Since the tobt is lower than tcrit (0.543 < 2.011), so the null hypothesis is not rejected. It means that the two samples are from the same population and there is no significant difference between the two groups. It can be concluded that experimental and control students' basic ability is not different.

Post Test Score

Post test conducted to identify students' final reading comprehension. After the post test result from experimental class and control class are collected, the result was analyzed. The data was analyzed by Micosoft Excel to get descriptive statistical result from post test score in experimental class and control class. The data include number of students, mean, maximal score and minimum score.

According to the charts above it points that the mean of post test score of control class with 30 students is 19, maximum score is 27 and minimum score is 11 and the mean of post-test of experimental class with 30 students is 24, maximum score is 30 and minimum score is 16. Table 6 provides the highest, lowest, sum, and mean of the students' scores from the experimental and the control group in the post test.

The table shows that the mean of the experimental group is 24, while the mean from control group is 19. Based on the table, the

mean score from experimental group is higher than the control one. The pretest scores must be examined for the normality of distribution and homogeneity of variance before comparing the data between the experimental and the control group, by using SPSS 20.

Table 6. The post-test scores

Subjects (30 students)	Experimental Group	Control Group
Highest Score	30	27
Lowest Score	16	11
Sum	718	557
Mean	24	19

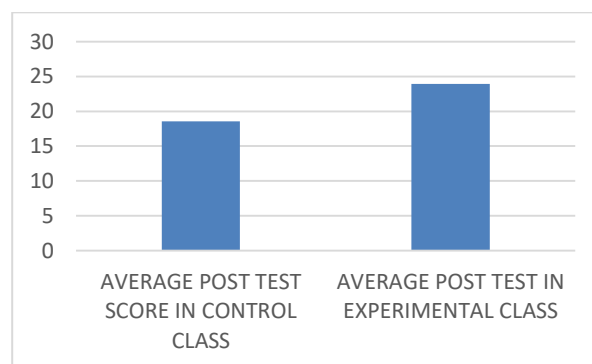


Figure 2. The comparison of post test score in both classes

Table 7 reveals that the probability (Asymp.Sig) of the experimental group is 0.915 and control group is 0.723 higher than the level of significance (0.05). It can be concluded that null hypothesis was not rejected; the score of experimental and the control group were normally distributed.

Table 8 shows that the probability (based on means) of the homogeneity of variance test is 0.400 which is higher than the level of significance (0.05). It can be concluded that the null hypothesis was not rejected; the variance of the two groups were equal.

Table 9 reveals that the *t*obt is 2.261 (the absolute of 2.261) and the degree of freedom (df) of pretest is 58. This means that the *t*crit is 2.011 at the level 0.05 (based on the critical values of *t* at the 0.05 level to the line *df* = 58). Since the *t*obt is higher than *t*crit (2.261 > 2.011), the null hypothesis was rejected. It means that the two samples were from the same population and there was significant difference between the two groups. It can be concluded that experimental and control students' basic ability is not different.

Based on the Table 10, *t*obt gained is 10.770 with sig. 0.000 and the degree of freedom (df) is in 29. It implies that *t*crit is 2.064. Considering the obtained scores, it is concluded that the *t*obt is higher than *t*crit (10.770 > 2.064). Thus, the null hypothesis was not accepted; there was significant difference between pre-test and post-test of the control group. After having completed several

treatments except the use of jigsaw, the control group's reading ability was improved.

Based on the Table 11, *t*obt gained is 8.796 with sig. 0.000 and the degree of freedom (df) is in 29. It implies that *t*crit is 2.064. Considering the obtained scores, it is concluded that the *t*obt is higher than *t*crit (8.976 > 2.064). Thus, the null hypothesis was not accepted; there was significant difference between pre-test and post-test of the experimental group. After having completed several treatments except the use of jigsaw, the control group's reading ability significantly improved. These findings supported the research hypothesis that the use of jigsaw has affected to the students' reading ability.

Questionnaire

From the interview, it was found that students have positive and negative responses toward the use of jigsaw technique in teaching learning activity. Regarding to the students' positive responses of using jigsaw technique in reading class, the students' answers were categorized into three points. They were fun, helpful, and improving cooperation. The result is presented in Figure 3.

Table 7. One-Sample Kolmogorov-Smirnov Test Post Test

		NILAIEXP	NILAICONTROL
N		30	30
Normal Parameters ^{a,b}	Mean	23.93	18.57
	Std. Deviation	3.290	3.059
	Absolute	.102	.127
Most Extreme Differences	Positive	.084	.120
	Negative	-.102	-.127
Kolmogorov-Smirnov Z		.557	.693
Asymp. Sig. (2-tailed)		.915	.723

a. Test distribution is Normal.

b. Calculated from data.

Table 8. Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
2.744	7	18	.400

Table 9. Independent Samples Test Post Test

	Levene's Test for Equality of Variances				t-test for Equality of Means					
	F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
								Lower	Upper	
NILAI	Equal variances assumed	.125	.725	2.261	58	.028	1.83333	.81096	.21001	3.45665
	Equal variances not assumed			2.261	57.092	.028	1.83333	.81096	.20946	3.45720

Table 10. Paired Samples Test

	Mean	Paired Differences			t	df	Sig. (2-tailed)		
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1	PRETEST - POSTTEST	-2.40000	1.22051	.22283	-2.85575	-1.94425	-10.770	29	.000

Table 11 Paired Samples Test

	Mean	Paired Differences			t	df	Sig. (2-tailed)		
		Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1	PRETEST - POSTTEST	-5.93333	3.69467	.67455	-7.31295	-4.55372	-8.796	29	.000

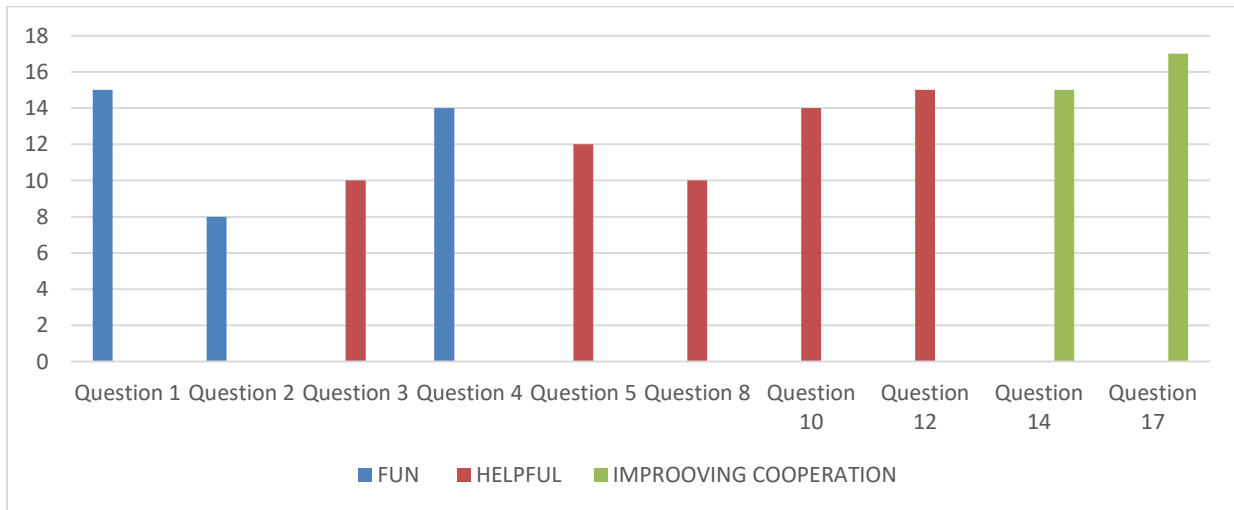


Figure 3. Students' positive responses

The finding proved that they were interested to use jigsaw in English course because it was enjoyable, new learning activity, made the happier in learning English, they feel more excited in learning activity. When the students were asked to work in a group, they confirmed that they get more attractive to the discussion, they get more confident in learning because the learning atmosphere had made them happier, so the learning activity become more meaningful. Jigsaw technique can be said as a fun learning on the previous pie chart. It is supported by Lie (2002.p. 68) that teacher give more attention to the students' learning experience and asked them to be active in learning activity, so the activity will be more meaningful. The finding above is consistent with Blanton et al., 2007; Neufeld 2006; Rapp et al., 2007 (cited in Westwood, 2008, p.31) and Anderson, Hiebert, Scott & Wilkinson, 1985; Jenkins, Larson & Boardman, 2007, p.3). As said

by Blanton (cited in Westwood, 2008, p. 31) reading comprehension is an active thinking process which the readers construct meaning to a deeper understanding of concepts and information presented in a text. Anderson (cited in Klingner, Vaughn & Boardman, 2007, p. 3) added that reading comprehension is the process of constructing meaning by coordinating a number comprehend a text easier than before it applied (Brown, 2001, p. 306). In other words, jigsaw technique became a tool that proficient the readers to solve their problem to comprehend a text (Moreillon, 2007, p.11).

Even though most of students give positive responses, there is also negative responses revealed related to the technique. The result of interview on negative responses of using jigsaw technique in reading class is presented in Figure 4.

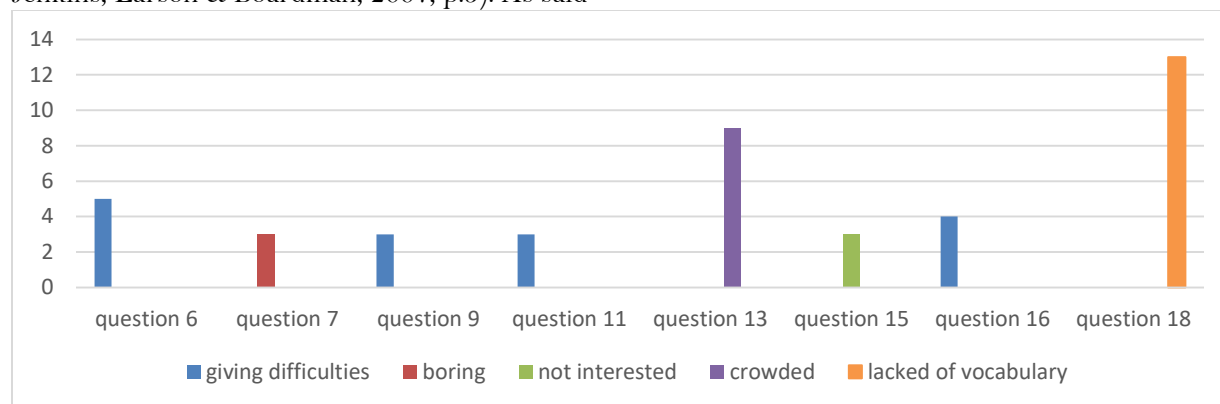


Figure 4. Students' negative responses

According to the chart 4.2 above, it showed that students' negative responses towards jigsaw technique in reading class were difficulties, boring, not interested, crowded and lack of vocabulary. According to Pinter (2006, p.83) that language users is also need to understand the complex interaction of vocabulary in the text to make the users fluent. In this case, students translated the text by word for word so that they will be more confusing while discuss it with other students in expert group. The students confirmed that working in a group was noisy since some students chatting during the learning activity, playing with other students, it made the other

students whom serious in learning were disturbed by them.

CONCLUSIONS AND SUGGESTIONS

According to the result of the research, teaching reading by using jigsaw technique could improve the students' reading comprehension. The research question number one about the effectiveness of jigsaw technique was shown from statistic computation. The quantitative data show that jigsaw technique brought an improvement to students' reading comprehension. The data was gained by comparing the mean score of pretest and posttest, which are then calculated by using

SPSS 20 for Windows. By comparing the result, it revealed that the students' reading comprehension significantly improved. The difference was indicated by the value of *t*obt higher than *t*crit. It means that there was a significant difference between the means in the reading comprehension of the target.

However, the interviews were analyzed qualitatively by elaborating the students' answer. The data from interview indicated that the students had some positive responses toward the implementation of jigsaw even at the first-time students thought it was difficult. Related to the advantages, there were some points highlighted derived from students' answer on the interview. The points were; jigsaw technique was a fun learning, helpful in comprehending the text, improving their cooperation with their peers, building responsibility to the group.

The findings and conclusions of the study have some important practical implications. Teachers can use jigsaw technique for another learning activity in teaching reading. There are several suggestions proposed in the research addressed to the teachers. English teachers are suggested to find out an interesting technique in teaching reading to improve students' interest and ability in reading. Moreover, teachers must select the suitable text to the students based on their capability.

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