The Influence of Jigsaw Method on Anxiety and Self-efficacyin Learning a Foreign Language

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Abstract---

Purpose: *Although the Jigsaw cooperative learning method has long been known in the world, there is still less evidence of that application on foreign languages learning in Indonesia. This study aims to understand the effect of Jigsaw learning method on anxiety and self-efficacy, as well as to analyse the correlation between self-efficacy and anxiety in learning a foreign language.*

Methodology: *This is an experimental study with a Pre-Post-Test with Control group design. Subjects are high school students who have high anxiety in learning a foreign language. The total subjects were 182 students who were divided into two groups, 92 students learned English with the jigsaw technique while 90 students with conventional lecturing. The experiment was conducted in 8 sessions. Measuring anxiety used The Foreign Language Classroom Anxiety Scale by Horwitz, Horwitz & Cope, while self-efficacy was modified from Self-efficacy Scale by Bandura. Wilcoxon signed-rank test was used to compare the difference between anxiety and self-efficacy on the pre-test and post-test group. Mann Whitney analysis was used to see the difference between experimental and control group. Furthermore, to determine the correlation between anxiety and self-efficacy, Spearman analysis was carried out.*

Results: *The results showed that anxiety in experimental groups was significantly decreased. Communication apprehension is the dimensions that have the highest decreasing among three dimensions. Besides, there was a significant increase in self-efficacy in the Jigsaw group. There was also a negative correlation between self-efficacy and anxiety in learning foreign language anxiety.*

Applications/Originality/Value: *This is the first study that reveal the relationship of Jigsaw methods to be applied in Indonesian high schools that rely on reading comprehension competencies and writing opinions. We suggest that the jigsaw method can be used as an alternative technique in learning a foreign language in Indonesian senior high school.*

Keywords--- *Foreign Language, Influence of Jigsaw, Self-efficacyin.*

I. INTRODUCTION SECTION

Students usually feel anxious, fearful, and nervous while they were learning a foreign language (Elaldı, 2016; Luo, 2014). A study reported moderate and high anxiety in high school students studying foreign languages in the

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United Arab Emirates (Lababidi, 2016). According to Trang, Baldauf, dan Moni (2013), two-third of the total students have foreign language anxiety but most teachers don't consider it as a serious problem. Teachers need to realize that foreign language anxiety has negative consequences on students' development. That phenomenon also happens in Indonesia in which most students have foreign language anxiety in learning English.

Foreign language anxiety becomes a wide phenomenon and It has a negative effect on learning a foreign language. There is a relationship between foreign learning anxiety with student achievement in different learning environments (Bollinger, 2017). Anxiety has a negative correlation with the motivation for learning (Liu & Chen, 2015). In general, anxiety is related to processing worried mind preferences or treated stimuli which can damage cognitive control. A study correlating anxiety to brain wave observation through EEG shows that anxiety affects memory strength (Sulianti, Yulianti, Riswanda, Amalia, & Anwar, 2018).

The antecedent of anxiety is various but most researches about foreign language anxiety have a similarity in connecting the cause with aspect from a student. Loyarte (2015) explains that foreign language anxiety is caused by students' characteristics, teachers' characteristics, and class procedures. This is supported by research conducted by Gkonou which concluded student's foreign language anxiety lies in students' perceptions about the lessons, class procedures, and themselves as students. Fear of teachers and other students' evaluation are also appointed as social-psychological constraints. (Gkonou, 2013).

The curriculum of a foreign language for high schools in Indonesia requires a comprehensive reading of competency and opinion writing using English. The ability to write in a foreign language was affected by self-efficacy. Self-efficacy is a strong predictor of performance in a variety of language skills and assignments (Raoofi, Tan, & Chan, 2012). Self-efficacy affects the success of students in learning foreign languages (Sturgeon, 2016) Self-efficacy has a positive correlation with motivation to learn foreign languages (Roshandel, Ghonsooly, &Ghanizadeh, 2017). Research on academic writing suggests that there is a strong negative correlation between self-efficacy writing and writing anxiety. The study used 3 components namely somatic anxiety, cognitive anxiety, and avoidance behavior (Kırmızı&Kırmızı, 2015). It was found that self-efficacy, anxiety, together with the process of setting goals, played an important role in influencing students 'efforts, and consequently affecting learners' achievements (Shih, 2019). Research on foreign language anxiety of engineering students shows the same level of anxiety, whereas students who are taking doctoral programs have higher self-efficacy than master programs (Ho, 2015). This is in line with the results of Ibrahim's research which showed that writing anxiety decreased and the writing self-efficacy perception increased in first-grade students. Whereas in third-grade candidates, writing anxiety increases and the writing self-efficacy perception decreases (Aydın, 2018). Thus, the stages of psychological development play a role in the relationship between anxiety and self-efficacy.

One of the learning methods suggested is cooperative learning. According to Johnson (2005), cooperative learning is a learning strategy where students with different abilities are set up in small groups and teacher uses a variety of learning activities to improve students' understanding about the lessons studied. Each member of the group is responsible for understanding the material and helping friends in the group to create a climate of

achievement and understanding. Students work together so that all students can understand and complete their assignments.

Some studies show that cooperative learning with the jigsaw technique increases students' understanding and make them comfortable. The jigsaw technique is an effective way to increase student involvement through teamwork facilitating peer-to-peer (Shume, Stander, & Sutton-Grier, 2015). Azmin (2016) also suggests that the jigsaw technique is fun to improve students' achievement. The research conducted on physics shows that cooperative learning with the jigsaw technique reported increasing students' understanding in studying physics concepts (Karacop, 2017). Besides, the jigsaw technique is called effective for increasing motivation, learning achievement, self-confidence and willingness to learn science lessons and other lessons (Tarhan, Ayyildiz, &Sesen, 2013).

Someones' belief about the ability to organize and complete a task and to achieve certain results is called self-efficacy. Several studies reveal a correlation between anxiety and self-efficacy. Loyarte (2015) argues that anxiety in learning languages is influenced by self-confidence and self-efficacy in completing the assignment. The study conducted by Liu et al also supports the correlation between motivation, self-efficacy and foreign language anxiety (Liu & Chen, 2015). Besides, decreasing anxiety in the exam is influenced by self-efficacy (Qudsyi&Putri, 2016). However, not all results of the study support the correlation between self-efficacy and anxiety. A study conducted by Cubukcu (2008) does not show a correlation between self-efficacy and anxiety in learning a foreign language.

Research questions

Although the Jigsaw cooperative method has been widely used in the world, it was still little information about how it affects anxiety and self-efficacy in learning foreign languages. Since senior high school students in Indonesia are expected to have reading comprehension and writing opinions competencies, several problem formulations will be examined in this study.

1.   Does the Jigsaw cooperative method reduce foreign language anxiety?
2.   Does the Jigsaw cooperative method improve self-efficacy in learning a foreign language?
3.   Is there a correlation between foreign language anxiety and self-efficacy in learning foreign languages with reading comprehension and writing opinions competency?

II. METHOD

This is an experimental study using the Jigsaw cooperative learning in one semester to see its impact on anxiety and self-efficacy related to reading comprehension and writing opinion competencies. This research used experiment Pre-Post-Test with Control group design. The students in the experimental group had cooperative learning with the jigsaw technique while the students in the control group had conventional learning (lectures using multimedia). Jigsaw cooperative learning method was an independent variable and self-efficacy as dependent variables

Population and Sample

The population of this study is students at vocational school in Malang, East Java since the phenomenon of high level on foreign language anxiety happen on that school. There were three classes involved which are grade X, XI,

and XII. Population target for this study are students of grade XI since they have known their friends for one year so that they will be comfortable in small groups communication. There are 30-31 students in one class. At first, it was a survey for categorizing anxiety until it had 6 classes having a high level of anxiety. Simple random sampling technique was used with classes as a randomized unit to avoid ambiguous anxiety due to split of students in the class. The stages of randomization are presented in Figure 1.
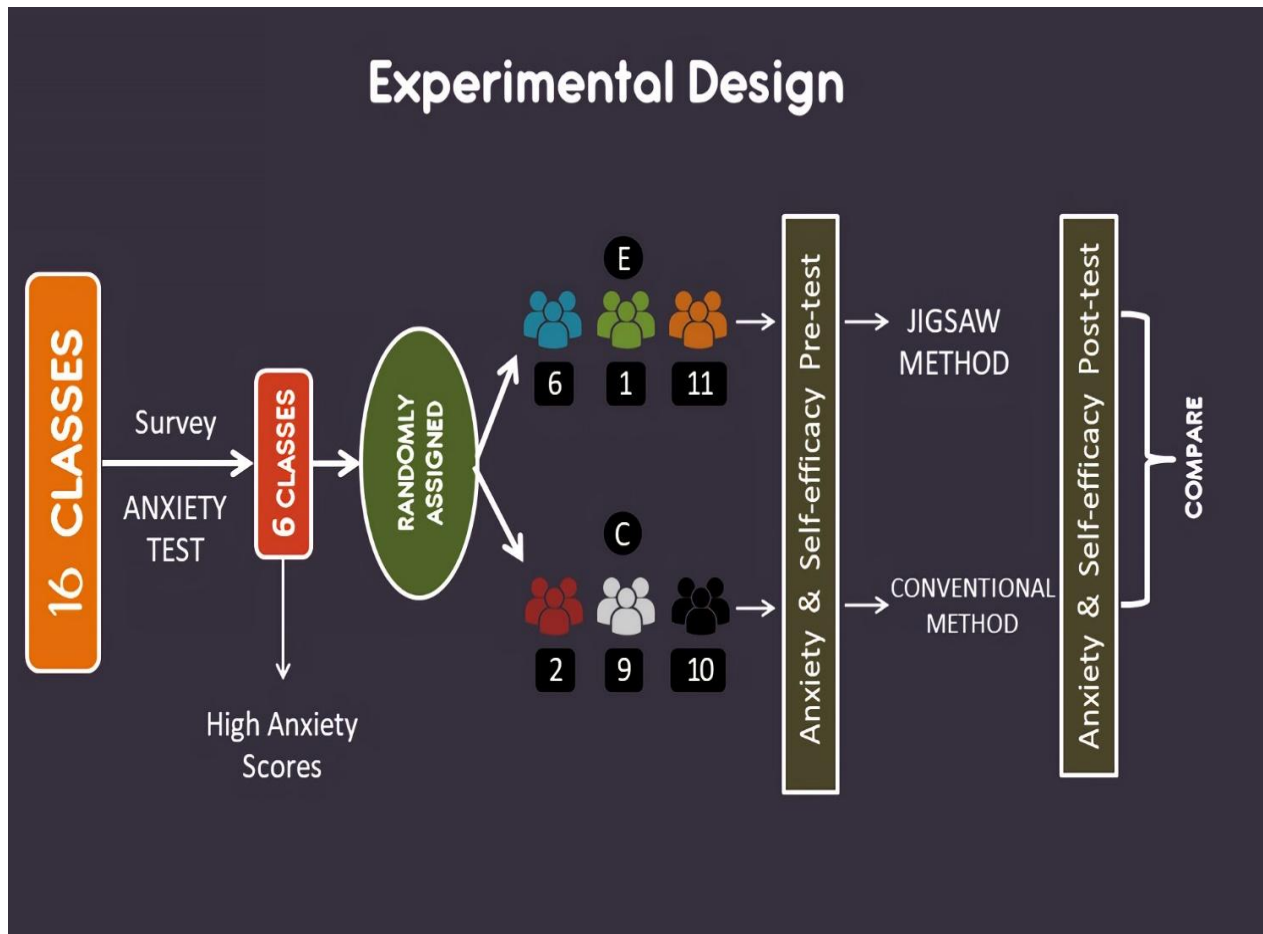

Figure 1: The experimental design

Classes are randomized units and from a total of 16 grade XI available. There were six classes were selected with high anxiety which consists of 3 classes for the experimental group and 3 classes for the control group. Based on randomized classes with a high level of anxiety, 92 students from class 1, 6, and 11 were chosen as an experimental group while 90 students from classes 2, 9, and 10 are in control group.

Research Instruments

Word Instruments used in this research are foreign language anxiety scale and self-efficacy scale. There is three related situation-specific performance anxiety based on Horwitz, Horwitz & Cope theory, namely communication apprehension, test anxiety, and fear of negative evaluation (Kráľová, 2017).

The Foreign Language Classroom Anxiety Scale which consists of 33 items and uses a Likert scale was developed by Horwitz and Cope (1986). Then, measuring self-efficacy adopted from the Children's Self-efficacy Scale developed by Bandura (2006), which consists of 32 questions. The statement reveals student's self-efficacy in learning a foreign language. The self-efficacy scale consists of four dimensions, namely self-efficacy in enlisting social resources, self-efficacy for academic achievement, self-efficacy for self-regulated learning and self-assertive efficacy. After having item analysis, validity, and reliability test, there were 24 questions for anxiety and 26 questions for self-efficacy.

Research Procedures

The procedure of this study was begun by distributing pre-test foreign language anxiety and self-efficacy scale to the experimental group and control group. Furthermore, treatment was applied in the experimental group by having a cooperative learning strategy with jigsaw technique and conventional learning strategy with lecturing and an overhead projector in the control group.

In the experimental group, the teacher divides students into jigsaw groups (5-6 people) which vary in gender and abilities. From 92 students on the experimental group, there was 18 small group for the jigsaw. The group leader is chosen by students. The teacher divides lesson material into 5-6 parts. Students briefly read their material then all students gather in expert groups based on their part material obtained. The expert group discuss the material, check their comprehension and prepare themselves to explain the materials to other friends in the jigsaw group. Having a discussion, all members return to the jigsaw group and explain the material as their part. A teacher goes around the class monitoring each group. If there is a group who is highly dominated and crowded, the teacher intervenes as needed. There are four language skills applied in these learning activities which are reading, writing, listening and speaking.

Both the experimental and control group had eight-session which consists of two periods of a lesson with 90 minutes duration. After having eight sessions of treatments, the two groups were given post-test of foreign language anxiety scale. Researchers used an English teacher from the Malang Language and Professional Education Institute to apply cooperative learning with the jigsaw technique for the experimental group. Meanwhile, English teachers from Vocational Schools taught control group applying the conventional strategy. This study did not apply "swap teaching" so that each teacher focused on the learning technique used.

A material used for treatment is a syllabus, lesson plan, English handbook for grade XI senior high school and individual quiz. Before conducting the research, researchers prepare the lesson plan for English learning which based on competency demanded; reading comprehension and writing the opinion. Even though the experimental group had different learning syntax from the control group, time allocation and material had been the same.

III. RESULTS

Anxiety and self-efficacy variable were presented in a descriptive form as well as statistical analysis. The result of comparing anxiety between experimental group and control group before and after treatment was shown in figure 2.
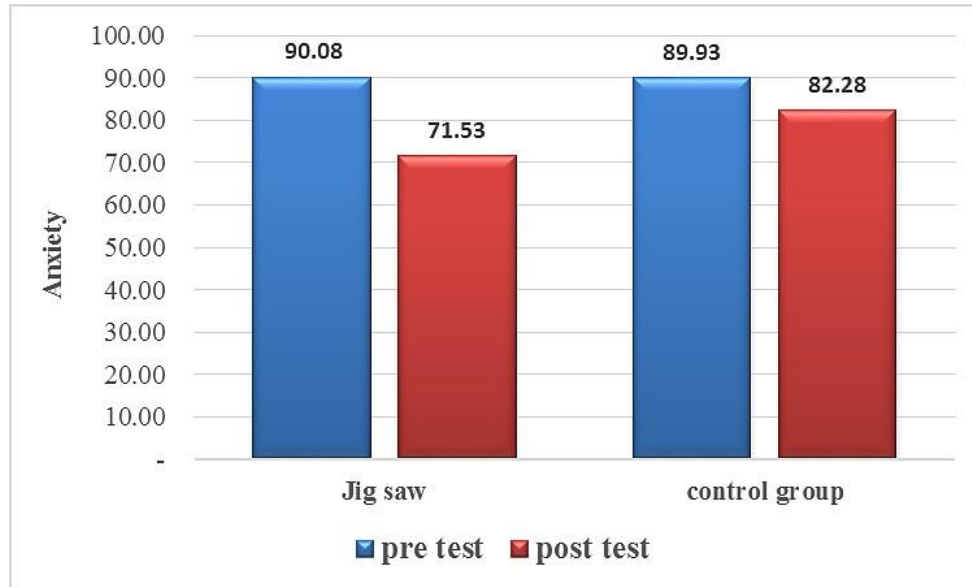
Figure 2: Anxiety on experimental and control group

Figure 2 revealed decreasing of anxiety on both groups. Score on the experimental group was 90.08 and control group was 89.93. This showed that anxiety between those groups was balance before having treatment. Then, the Wilcoxon signed-rank test was conducted to compare the significant decrease of anxiety on each group as shown in table 1.

Table 1: The t-test of anxiety between the experimental and control group.

	Anxiety Jigwas post-test - Anxiety Jigsaw pre-test	Anxiety post-test control group - Anxiety pre-test control group
Z	-8.336[a]	-8.221[a]
Asymp. Sig. (2-tailed)	.000	.000
a. Based on negative ranks.		
b. Wilcoxon Signed Ranks Test		

Table 1 shows that after having 8 sessions of treatment, there was a significant decrease in anxiety both in the experimental group and control group. Furthermore, to compare the decrease of anxiety between experimental group and control group then Mann Whitney was conducted in which presented in table 2.

Table 2: The decrease of anxiety on the experimental group and control group.

	Anxiety
Mann-Whitney U	445.500
Wilcoxon W	4.724E3
Z	-10.408
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Jigsaw	

Table 2 showed there was a significant difference in decreasing English learning anxiety both in the experimental and control group. Cooperative learning with jigsaw technique indicated decreasing in learning English anxiety. Next, figure 3 showed three dimensions of English learning anxiety which have a decline.
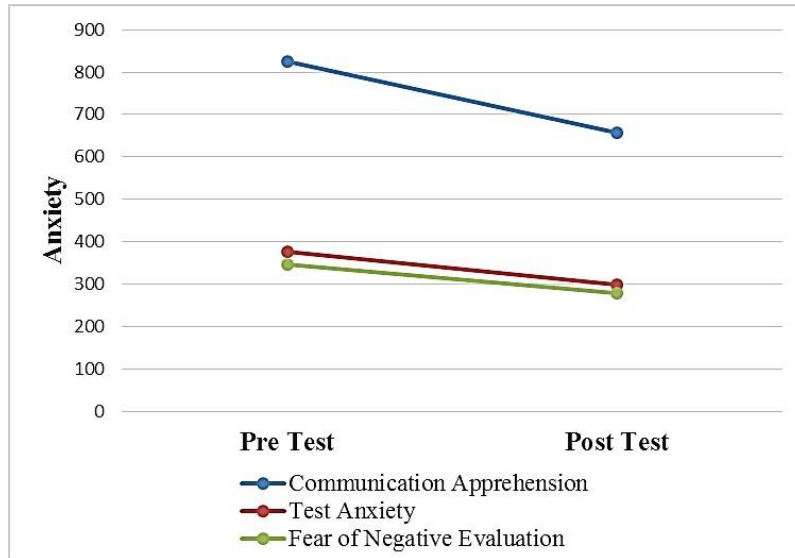
Figure 3: Description of decreasing English learning anxiety using the jigsaw technique

Figure 3 showed that the dimension of communication apprehension had the biggest decrease. Furthermore, descriptive data of self-efficacy from the experimental and control group were presented in figure 4.
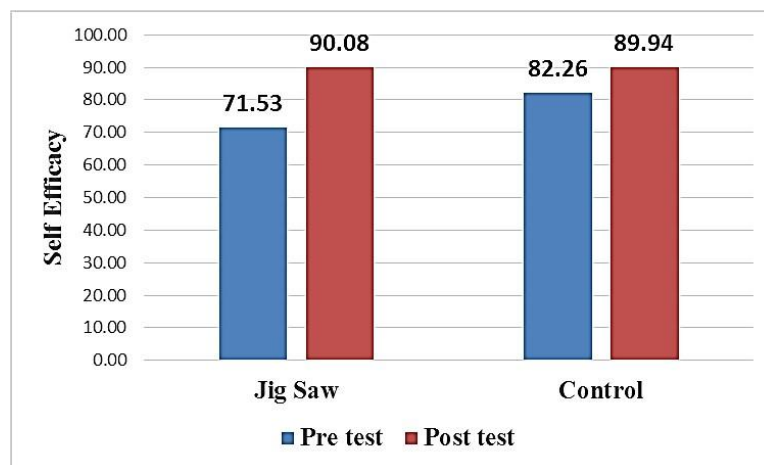

Figure 4: Self-efficacy on experimental group and control group

Figure 4 showed that self-efficacy in the experimental group increased by 18.54 and control group by 7.69. To see the significant differences between experimental and control groups, Mann Whitney tests were conducted since the data were not normally distributed.

Table 3: The t-test of self-efficacy between the experimental and control group.

	Self Efficacy
Mann-Whitney U	445.500
Wilcoxon W	4540.500
Z	-10.408
Asymp. Sig. (2-tailed)	.000
a. Grouping Variable: Learning Method	

Table 3 showed that the self-efficacy of students in the experimental group is higher than the control group. Next is a correlation test between self-efficacy and learning English anxiety using Spearman which was presented in table 4.

Table 4: Correlation between self-efficacy and English learning anxiety.

Correlations				
			Anxiety	Self Efficacy
Spearman's rho	Anxiety	Correlation Coefficient	1.000	-.642[**]
		Sig. (2-tailed)	.	.000
		N	182	182
	Self Efficacy	Correlation Coefficient	-.642[**]	1.000
		Sig. (2-tailed)	.000	.
		N	182	182
**. Correlation is significant at the 0.01 level (2-tailed).				

Table 4 showed that there is a negative correlation between self-efficacy and English learning anxiety. The higher self-efficacy had lower anxiety in learning a foreign language and vice versa.

IV. DISCUSSIONS

Jigsaw of cooperative learning can reduce students' anxiety in learning English. This can be explained through the theory argued by Karabiyikand Ozkan that the students' basic need in learning a foreign language is safety feeling in the classroom (Karabıyık&Özkan, 2017). Being in a small group with peer applying jigsaw method can arise a sense of security among students. Cooperative learning creates a situation has lower levels of anxiety and provides greater motivation to the students. Interactions that occur between members in the group make them able to learn from each other so there will not be fear of being laughed at since all members mutually motivate each other. These are for the sake of reducing anxiety in foreign language learning, especially the fear of getting a negative evaluation from their colleges.

The second finding of this study showed that the most decreasing dimension in learning English anxiety is communication apprehension. Since students act as teachers' mediator in jigsaw group, then they are not afraid to communicate. That makes them feel happy and curious so that their anxiety in learning English is also decreasing. On the other hand, based on our observations, students on control group are afraid to ask a question, afraid of making mistakes and being laughed by other students so it makes students feel ashamed to ask if they don't understand the lesson. This makes students feel not sure about their potential in solving problems. At last, this inhibits student progress learning in learning a foreign language.

The third finding was students on the control group had lower self-efficacy compared to the experimental group. In contrast to the conventional method, teacher applying jigsaw technique make themselves work with students. Good cooperation and democratic climate in the class implies that the teacher opens up to accept influence from students. In jigsaw class, when students sit on the expert group then their position is called as equal partners with the teacher. Therefore, that acknowledgment can increases student's self-efficacy on the experimental group. Applying

jigsaw can provide direct experience and make even weak students can learn from the experiences of others. By observing friends who managed to do a good job could improve the self-efficacy in students who have weaker self-efficacy (Usher and Pajares, 2008). In line with the idea of some studies that have also concluded that self-efficacy may be influenced by the method of learning, the learning context, and social factors. Research conducted by Darnon, Celine, and Delphine (2012) also concluded that the self-efficacy of students increased in the group receiving the learning using jigsaw of cooperative learnings. Students on the control group had lower self-efficacy compared to the experimental group. In contrast to the conventional method, teacher applying jigsaw technique make themselves work with students. Good cooperation and democratic climate in the class implies that the teacher opens up to accept influence from students. In jigsaw class, when students sit on the expert group then their position is called as equal partners with the teacher. Therefore, that acknowledgment can increases student's self-efficacy on the experimental group.

Then the fourth finding indicated that there is a negative correlation between self-efficacy and anxiety in learning foreign language anxiety. This happens because students with high self-efficacy have a higher belief in their ability to learn English. They believe that they can do the assigned task and follow all the learning stages that have been designed by the teacher. This finding was in line with Tanveer research which arguing that foreign language anxiety often comes from the learners itself related to their own cognitive ability, difficulty in learning language, different culture and target language, different social status with the native speaker, and fear of losing self-identity (Khattak, Jamshed, Ahmad, &Baig, 2011). This research supported Thakur research (2013) which describe the negative and significant correlation between self-efficacy with anxiety in learning where the higher self-efficacy students have lower levels of anxiety within them. Besides, this research also in line with Barrows research which explaining that when learners feel not sure with their ability like facing the test then they will focus on feeling worried about the bad score and not on their academic achievement. Therefore, the score of the test can be predicted from the level of anxiety and self-efficacy in which self-efficacy moderating effect of anxiety (Barrows, Dunn, & Lloyd, 2013). All figures and tables should be presented clearly. Make sure they are readable and clear in formal and simple style. Vertical lines are not necessarily added in tables. All figures should not have borders and make sure all information in the image can be read and not too small. Comparison curves in one plot should have different markers to see difference clearly.

V. CONCLUSIONS

Jigsaw of cooperative learning can reduce students' anxiety in learning English. This can be explained through the theory argued by Karabiyikand Ozkan that the students' basic need in learning a foreign language is safety feeling in the classroom

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