



The Effectiveness of Jigsaw Method and CIRC Method on Enhancing Students' Reading High Order Thinking Skills with Different Self Efficacy Levels through Blended Learning

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Abstract: High-order thinking skills require people not only to remember what they have learned but to analyze and evaluate the information, and later create, use, and maximize the information. The objectives of the study is to analyze the effect of Jigsaw and CIRC Method on enhancing students' reading HOTS in terms of different self-efficacy levels. This study implemented mixed methods. The study was conducted at the eleventh grade of SMAN 11 Bandung. Two classes with purposive sampling were participated in this study. The instrument were reading test supported by classroom observation. Quantitative data were analyzed by Shapiro Wilk and Levene Test, continued by Wilcoxon Test, paired t-test, one-way ANOVA, two-way ANOVA, Mann Whitney test, and Pearson Chi-Square test, whereas the qualitative data were analyzed by content and thematic analysis. The data revealed that the implementation of the Jigsaw Method was only effective on enhancing students' reading HOTS in low self-efficacy levels and could not enhance students' reading in moderate and high self-efficacy levels. Whereas, the implementation of the CIRC Method was not effective on enhancing students' reading in low, moderate, and high self-efficacy levels.

Keywords: Jigsaw Method, CIRC Method, reading HOTS, self-efficacy

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INTRODUCTION

Information, economics, and technology change rapidly in many areas so that students face many challenges. To meet those challenges and be successful in the future, students must equip with the appropriate skills. The students must master decision-making, prioritizing, strategizing, and collaborative problem-solving skills. According to the Indonesian Regulation of The Ministry of Education and Culture Number 59, the Year 2014 on Curriculum 2013 for High School Education, it is stated that one of the fundamental curriculum improvements is the existence of internal and external challenges. The external challenges, among others associated with globalization and the issue related to the environmental problem, and information technology advances, the rise of creative industries, cultural and educational development of the internal level. In addition to the challenges above, Indonesian education is also trying to meet the goals of 21st-century education.

The main goal of Indonesian education is to build students' character to prepare them to cope with their future jobs. However, the problem educational institutions are facing is that future of today's children is so unpredictable. Employers require creative and problem-solving skills and the ability to adapt to changes. Those new skills and abilities cannot increase by giving students regular treatment. Teachers need to foster new skills in the classroom, known as 6 C's skills in education (Miro, 2021). Moreover, Miro (2021) argues that education need to shape human resources that are not only workers who follow orders, but have 21st-century skills known as 6c's namely humans who have good communication skills, the ability to collaborate, think critically, and can solve problems (critical thinking and problem solving) and creative, and able to innovate (creativity and innovation).

High Order Thinking Skill (HOTS) that is also known as critical thinking required students to remember what they have read and learned and analyze and evaluate the information, and later create, use, and maximize the information in their future life (Brookhart, 2010). The approach adopted in this study is the construction of the cognitive dimension of the revised Bloom's Taxonomy, which is analyzed, evaluate, and create, or in the older terms known as analysis, synthesis, and evaluation (Anderson et al., 2001).

In the Indonesian context, educators are familiar with Bloom's taxonomy term. Based on the writer's observation and interview, current teaching-learning activities in senior high school, particularly in the eleventh grade of senior high school in some areas, are still in Lower Order Thinking Skills (LOTS) level. In terms of

assessment, the task and assignment are given to the students mainly measure recalling aspects of students' knowledge as leads in LOTS. Furthermore, based on an informal interview with some English teachers, most senior high school students could not give an appropriate response to reading HOTS questions type.

Although reading and thinking skills are essential for high school students to have, based on the 2018 PISA report, the reading ability of Indonesian students is ranked low. Based on Results from PISA 2018, Indonesia's reading score is ranked 72 out of 77 OECD countries (Organisation for Economic Co-operation and Development, 2019). So far, exam questions in Indonesia have a level of difficulty below PISA - which is already based on HOTS. The high level of PISA question happens because the founding countries of the OECD (the organization that provides PISA) have implemented the Bloom taxonomy system in their education systems. Meanwhile, the curriculum in Indonesia does not apply this system at all, except for the national exam.

To solve the aforementioned problem, this research implemented Jigsaw and CIRC Method on enhancing students' reading HOTS. The methods are part of Cooperative Learning Strategies proposed by King et al. (2012). Several research studies reveal that Cooperative Learning proves much higher academic success than individual or competitive learning strategies (Hornby, 2009; Johnson & Johnson, 2012). Besides, a few scholars also research the ELT field and show that learning English through Cooperative Learning has higher accomplishment scores than other methodologies (Wichadee, 2005).

In term of self-efficacy, there is a standard agreement among researchers that individuals who own a high degree of self-efficacy are more likely to pursue challenging tasks, stay engaged on those tasks, and put in more effort in the process (Haj-Yahia et al., 2019). Bandura (1997) defines self-efficacy as individual confidence in their ability to solve a problem or accomplish a task. If highly successful individuals fail, they attribute the outcome to their lack of effort or an adverse environment. Conversely, when they achieve or become successful, they credit that to their hard work and abilities. Within that framework, self-efficacy beliefs determine how individuals behave, interpret the effects of their behavior, and respond to their social environment. Self-efficacy are divided into three levels, those are high self-efficacy, moderate self-efficacy, and high self-efficacy.

In conducting the study, the researcher faces significant challenges due to an extraordinary situation. In this study, there was a compulsion to switch the learning mode in the middle of the research from offline learning into online learning. The implementation of online learning occurred due to the outbreak of the Covid 19 pandemic. The change of learning mode from offline learning to online learning makes the learning in this study categorized as blended learning. Littlejohn and Pegler (2007) and Mukarromah and Wijayanti (2021) define blended learning as learning that combines traditional approaches in face-to-face classes and online learning approaches. The implementation of blended learning maximizes the use of computers, tablets, smartphones, and other technologies in learning activities (Kaur, 2013; Mahmud, 2020; Mulyanti et al., 2020).

Concerning the elaboration of the fact mentioned earlier, the researcher aimed in investigating the implementation of Jigsaw Method and CIRC Method and analyzing the effect of those strategies on students' reading HOTS with different self efficacy levels. Furtheromre, this research is limited to the find out the effect of The Effect of CIRC Method and Jigsaw on enhancing Students' Reading HOTS with Different self-efficacy levels. Hopefully, the study could be beneficial not only for the writer but also for the teacher, future researcher, and the government. For the teacher, their understanding of how their students think and process what they are learning should improve continuously as a teacher would construct assessment specifically designed to show students' thinking (Brookhart, 2010). Furthermore, hopefully, the research result could contribute to the government program to increase students' HOTS in general.

METHODS

Relevant to the research objectives and research questions posed earlier, this study uses an Experimental Mixed Methods Design. According to Creswell (2012), the embedded concurrent experimental mixed method design in which one data set provides a supportive, secondary role in a study based primarily on the other data type. Multi-data collection method was used to analyze the effect of Jigsaw Method and CIRC Method on enhancing students' reading HOTS with different self-efficacy levels.

Quantitative data, such as students' reading HOTS scores, are intended to yield specific numbers statistically analyzed. It can produce results to assess the frequency and magnitude of trends and provide helpful information if there is a need to describe trends about many people. Meanwhile, qualitative data such as actual words in the study, offer many different perspectives on the study topic and provide a complex picture of the situation (Creswell, 2012; Heigham & Croker, 2009).

Table 1. A 3 x 3 Factorial Design of the Study

Research Variables	READING		
	Experimental Group using Jigsaw		Experimental Group using CIRC
		(A1)	(A2)
Self Efficacy	B1	A1B1	A2B1
	B2	A1B2	A2B2
	B3	A1B3	A2B3

The population of this study was the eleventh-grade student of SMAN 11 Bandung. The research sample were two classes consisting of 28 students in each class of the eleventh grade of SMAN 11 Bandung. Of those two classes, one class taught using Jigsaw Method and the other using CIRC Method. In the quantitative data analysis, the null and alternative hypotheses of this study are as follows.

- H₀1: There is no difference increase in students' reading HOTS in Jigsaw Method
- H₁1: There is a difference increase in students' reading HOTS in the Jigsaw Method
- H₀2: There is no difference increase in students' reading HOTS in CIRC Method
- H₁2: There is a difference increase in students' reading HOTS in CIRC Method

The reading test used to assess students' reading HOTS was adopted and adapted from English National Exam. There were two tests in this study those are pre-test and post-test. A pre-test was administered to gain information about students' reading HOTS before the treatment. The post-test was given to gain information about students' reading HOTS after the treatment. The questions given in the pre-test were the adoption of the 2019 National Examination English questions. There are several considerations for researchers to adopt the English National Examination.

RESULT AND DISCUSSION

To make it easier for readers to understand the stages in this subchapter, the researchers compiles them sequentially on the result of the research and discussion towards the research result.

The Effect of Jigsaw Method on enhancing Students' Reading HOTS with Different Self-Efficacy Levels

To answer the research question asking about the effectiveness of Jigsaw Method on enhancing students' reading HOTS with different self-efficacy level, the researchers elaborates the data gained from reading HOTS tests with multiple-choice questions. The reading HOTS test was administered before and after the treatment. For a brief description of reading HOTS scores in this section, the highest and the lowest scores, the distance or range between them, the mean and standard deviation scores are elaborated. The summary of descriptive statistics for pre-test reading scores of students who receive Jigsaw Method's implementation was shown in the following table.

Table 2. The Pre-test Report of Jigsaw Method Class

Method	Self Efficacy level	N	Mean	Std. Deviation	Minimum	Maximum
Jigsaw	Low	1	17.14300	.	17.143	17.143
	Moderate	18	44.76200	18.901379	14.286	82.857
	High	9	52.06333	19.154364	17.143	68.571
	Total	28	46.12246	19.435881	14.286	82.857

Based on a descriptive statistical analysis of the pre-test scores of students who were taught by Jigsaw Method, it is known that of the 28 students, the highest scores were 82.857, and the lowest was 14.286. The average pre-test scores of students taught by the Jigsaw Method were 46.122, with a standard deviation of 19.435. Based on a descriptive statistical analysis of the pre-test scores of students who were taught by Jigsaw Method, the highest and lowest scores for nine students with high self-efficacy levels were 68.571 and 17.143. The mean was 52.063, and the standard deviation was 19.154. The highest and lowest scores for 18 students with moderate self-efficacy were 82.857 and 14.286, with a mean and standard deviation of 44.762 and 18.901. The pre-test score of a student with a low self-efficacy level is 17.143.

The summary of descriptive statistics for post-test reading scores of students who were taught using Jigsaw Method was shown in the following table.

Table 3. The Post-test Report of Jigsaw Method Class

Method	Self Efficacy level	N	Mean	Std. Deviation	Minimum	Maximum
Jigsaw	Low	1	25.71400	.	25.714	25.714
	Moderate	18	53.96822	17.636723	22.857	71.429
	High	9	58.41256	17.963211	22.857	82.857
	Total	28	54.38768	18.094891	22.857	82.857

The results of descriptive statistical analysis of the post-test scores of students who were taught by Jigsaw Method showed that of the 28 students, the highest score was 82.857, and the lowest score was 22.857. Thus, the average post-test score of students was taught by Jigsaw Method was 54.387 with a standard deviation of 18.094.

Based on a descriptive statistical analysis of the post-test scores of students who were taught by Jigsaw Method, the highest and lowest scores for nine students with high self-efficacy levels were 82.857 and 22.857, mean of 58.412, and the standard deviation was 17.963. The highest and lowest scores for 18 students with moderate self-efficacy levels were 71.429 and 22.857, with a mean and standard deviation of 53.968 and 17.637. The post-test score of a student with a low self-efficacy level was 25.714.

This section describes the statistical tests of the reading HOTS test scores from the students who were taught by Jigsaw Method. Statistical tests were also carried out on the test results based on the self-efficacy level. The statistical test consists of the mean difference test to determine the differences before and after the treatment. The researcher first conducted a prerequisite test to perform the mean difference test, namely the normality and homogeneity test.

Normality and homogeneity tests were done to determine whether the data is equally distributed and has the same variance (homogeneous) or not. If the data meet the requirements for normality and homogeneity, the average difference test is performed using the T-test. Meanwhile, if the data is regular but not homogeneous, the mean difference test for independent data uses the T-test. However, homogeneity is not the main requirement for paired data, so it can still be continued using the T-test for paired samples (paired sample T-test). Finally, the average difference test uses the non-parametric test with the Wilcoxon test for data that do not meet the formality requirements.

The normality test is a test of the normal distribution of the data. The normality test is carried out to determine whether the distribution of data to be analyzed is normally distributed or not. Normally distributed data means that the data will follow the form of a typical distribution graph. The data normality testing using the help of SPSS 20 Software for Windows was carried out using the Shapiro-Wilk statistical test with the following steps:

- a. Determine the hypothesis statistically as follows:
 - H₀: samples come from populations are normally distributed
 - H₁: samples come from populations are not normally distributed
- b. Set the significance level $\alpha = 0.05$
- c. Comparing the significance level $\alpha = 0.05$ with the significance level obtained from SPSS with the following criteria:
 - If the value is Sig. (p-value) $\geq \alpha$ ($\alpha = 0.05$), then H₀ is accepted, meaning that the sample comes from a normally distributed population, so that the next analysis is to carry out the homogeneity test.
 - If the value is Sig. (p-value) $< \alpha$, then H₀ is rejected, meaning that the sample comes from a population that is not normally distributed so that the next analysis uses statistical non-parametric.

The following are the result of the normality test for the Jigsaw Method in all self-efficacy levels and per self-efficacy levels.

Table 4. Normality Test for Jigsaw Method in all Self-Efficacy Level

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test_of Jigsaw Method	.107	28	.200*	.964	28	.421
Post-test_of Jigsaw Method	.180	28	.021	.878	28	.004

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Because of value Sig. = 0.41 > $\alpha = 0.05$ it can be concluded that the data are normally distributed. However, the last test shows Sig. = 0.004 < 0.05, which means that the data are not normally distributed. Therefore, statistics calculation continues by non-parametric Wilcoxon statistical test.

Table 5. Normality Test for Jigsaw Method per Self-Efficacy

	Self-Efficacy Level	Kolmogorov-Smirnov ^b			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Pre-test_Jigsaw	Moderate	.101	18	.200*	.956	18	.533
	High	.327	9	.006	.793	9	.017
Post-test_Jigsaw	Moderate	.193	18	.075	.825	18	.003
	High	.159	9	.200*	.941	9	.588

*. This is a lower bound of the true significance.

a. Pre-test_of Jigsaw is constant when level_SE_js = SE Low. It has been omitted.

b. Lilliefors Significance Correction

d. Post-test_Jigsaw is constant when level_SE_js = SE Low. It has been omitted.

The hypothesis for the results of the Jigsaw Method normality test is as follows:

H₀: Samples come from populations that are normally distributed

H₁: Samples come from populations that are not normally distributed

The test criteria are if the value is Sig. > α then H₀ is accepted. Conversely, if the value is Sig. > α then H₁ is accepted. From Table 3 and 4 above, using the Shapiro-Wilk test and the significance level $\alpha = 0.05$, for learning with the Jigsaw Method at all self-efficacy levels, it is known that for the pre-test, the Sig. = 0.421 > 0.05, the data is normally distributed. However, for the post-test, the Sig. = 0.004 < 0.05, which means that the data are not normally distributed. Because the normality test results on the pre-test and post-test results are different, it cannot be concluded that the normality test and assumptions for the parametric test are not fully fulfilled. Therefore, statistical testing will be continued with non-parametric statistical tests using the Wilcoxon test.

The normality test results for the Jigsaw Method in terms of self-efficacy are presented in the following table.

Table 6. Normality Test Results of Jigsaw Method in terms of the Self-Efficacy Level

Self-efficacy Level	Test	N	Mean	Sig.	Result (H ₀)
High	Pre-test	9	52.063	0.017	Denied
	Post-test		58.412	0.588	Accepted
Moderate	Pre-test	18	44.762	0.533	Accepted
	Post-test		53.968	0.003	Denied
Low*	Pre-test	1	17.143	-	-
	Post-test		25.714	-	-

* for self-efficacy in Low level, because N = 1, the value is constant, so the test was ignored

From Table 6 it can be concluded that statistical testing of the Jigsaw Method in terms of the self-efficacy level will be followed by a non-parametric statistical test using the Wilcoxon test.

After testing the learning outcomes with the Jigsaw Method, both the normality test and the homogeneity test, the next step is to test the mean difference. This test is conducted to determine whether the Jigsaw Method enhances students' reading HOTS or not. Because the parametric test assumptions were not fulfilled for the Jigsaw Method test results at all self-efficacy levels, the mean difference test used the non-parametric Wilcoxon test. Those results are presented to answer the research questions and research hypothesis as well.

The mean difference test using the Wilcoxon test was administered to answer the second research questions, which states, How effective is Jigsaw Method on enhancing students' reading HOTS in terms of different self-efficacy levels? Besides, descriptive statistics presented as a basis for further statistical analysis. The Wilcoxon test results for the Jigsaw Method have presented in Tables 7 and 8.

Table 7. Rank on the Jigsaw Method Testing Using the Wilcoxon Signed Rank Test

Rank	N	Mean Rank	Sum of Ranks
Negative Ranks	11 ^a	9.55	105.00
Positive Ranks	16 ^b	17.06	273.00
Ties	1 ^c		
Total	28		

From Table 7 the information for the values obtained is as follows.

- a. The N value of the Negative Ranks group is 11, which means that 11 students have higher pre-test scores than the post-test.
- b. The N value of the Positive Ranks group is 16, which means that 16 out of 28 students have a higher post-test score than the pre-test.
- c. The N value of the Ties group is 1, which means that there is one student who has the same pre-test score as the post-test.

For decision making, the following hypothesis is made:

H₀: There is no difference increase in students' reading HOTS in Jigsaw Method

H₁: There is a difference increase in students' reading HOTS in the Jigsaw Method

Table 8. Wilcoxon Test Results on the Jigsaw Method

Test Statistics	
Z	-2.019 ^b
Asymp. Sig. (2-tailed)	.043

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

The test criteria are if the value is Sig. > α (α = 0.05) then H₀ is accepted. Conversely, if the value is Sig. > α then it is not sufficient to accept H₀. From the test results presented in Table 8 on the Asymp line. Sig. (2-tailed) shows that the Sig. = 0.043 < α. Thus, there is not enough requirement to accept H₀, so it can be concluded that there is a difference increase in students' reading HOTS in Jigsaw Method at all self-efficacy levels. After it was known that the Jigsaw Method could increase students' reading HOTS, to see the meaning of the increase, a test was carried out on the Normalized Gain value (N-Gain) for the Jigsaw Method.

However, because in this study there is a moderate variable, namely self-efficacy, this section describes the results of the Jigsaw Method mean difference test in terms of the self-efficacy level. Thus, it can be seen at which self-efficacy level the increase of students' reading HOTS exist. Since the parametric test assumptions were not fulfilled for the Jigsaw Method test results in terms of the self-efficacy level, the mean difference test used the non-parametric test, the Wilcoxon test. The Wilcoxon test results for the Jigsaw Method in terms of self-efficacy are presented in Table 9 and 10.

Table 9. Rank on the Jigsaw Method Testing Using the Wilcoxon Signed Rank Test in terms of Self-Efficacy Level

Self-Efficacy Level	Rank	N	Mean Rank	Sum of Ranks
High	Negative Ranks	3 ^a	3.33	10.00
	Positive Ranks	6 ^b	5.83	35.00
	Ties	0 ^c		
	Total	9		
Moderate	Negative Ranks	8 ^d	5.31	42.50
	Positive Ranks	9 ^e	12.28	110.50
	Ties	1 ^f		
	Total	18		

From Table 9, the information for the values obtained are as follows.

- a. The N value of the Negative Ranks group is 3, which means three students at the high self-efficacy level have higher pre-test scores than the post-test.
- b. The N score of the Positive Ranks group is 6, which means that 6 out of 9 students at the high self-efficacy level have a higher post-test score than the pre-test.
- c. The N value of the Ties group is 0, which means that no student at the high self-efficacy level has the same pre-test score as the post-test.
- d. The N value of the Negative Ranks group is 8, which means that 8 out of 18 students at the moderate self-efficacy level have higher pre-test scores than the post-test.
- e. The N value of the Positive Ranks group is 9, which means that six students at the moderate self-efficacy level have a higher post-test score than the pre-test.
- f. The N value of the Ties group is 1, which means that there is one student at the moderate self-efficacy level who has the same pre-test score as the post-test.

Table 10. Wilcoxon Test Results on the Jigsaw Method in terms of Self-Efficacy Level

Test Statistics	High Self-efficacy	Moderate self-efficacy
Z	-1.487 ^b	-1.610 ^b
Asymp. Sig. (2-tailed)	.137	.107

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

The test criteria are if the value is Sig. > α ($\alpha = 0.05$) then H_0 is accepted. Conversely, if the value is Sig. > α then it is not sufficient to accept H_0 . From the test results presented in Table 10 on the Asymp line. Sig. (2-tailed) shows that for the high self-efficacy level, the Sig. = 0.137 > α and for the moderate self-efficacy level, the Sig. = 0.107. Thus, H_0 is accepted, so it can be concluded that there is no difference increase of students' reading HOTS in Jigsaw Method at the high and moderate self-efficacy levels. The conclusion is that statistically, the increase of students' reading HOTS occurs at a low self-efficacy level.

The Effect of CIRC Method on enhancing Students' Reading HOTS with Different Self-Efficacy Levels

To answer the question asking about the effect of CIRC Method on enhancing students' reading HOTS with different self-efficacy level, the researchers elaborates the data gained from reading tests. The reading scores are those obtained from the reading HOTS test with multiple-choice questions administered before and after the treatment. For a brief description of reading HOTS scores in this section, the highest and the lowest scores, the distance or range between them, the mean and standard deviation scores are elaborated. The summary of descriptive statistics for pre-test reading scores of students who receive the implementation of CIRC was shown in the following table.

Table 11. The Pre-test Report of CIRC Method Class

Method	Self Efficacy_level	N	Mean	Std. Deviation	Minimum	Maximum
CIRC	Low	2	34.28600	.000000	34.286	34.286
	Moderate	15	37.71413	12.740988	8.571	65.714
	High	11	62.59745	17.863801	28.571	80.000
Total		28	47.24486	19.007719	8.571	80.000

A descriptive statistical analysis of the pre-test scores of students taught by CIRC Method showed that of the 28 students, the highest and lowest scores were 80.00 and 8,571. The average pre-test score of students taught by CIRC Method was 47,244 with a standard deviation of 19,007.

The descriptive statistical analysis of the pre-test scores of students who were taught by CIRC Method in Table 11 showed that the highest and lowest scores for 11 students with high self-efficacy levels were 80.00 and 28.571 with a mean and standard deviation of 62.597 and 17.864. The highest and lowest scores for 15 students with moderate self-efficacy were 65.714 and 8.571, with a mean and standard deviation of 37.714 and 12.741. As for the pre-test scores of students with low self-efficacy levels, both of them obtained 34.286.

From the post-test result, here is the summary of descriptive statistics for post-test reading HOTS scores of students who got the implementation of CIRC.

Table 12. The Post-test Report of CIRC Method Class

Method	Self Efficacy_level	N	Mean	Std. Deviation	Minimum	Maximum
CIRC	Low	2	62.85700	.000000	62.857	62.857
	Moderate	15	42.47613	22.828271	5.714	71.429
	High	11	63.63627	12.261701	34.286	82.857
Total		28	52.24482	20.979156	5.714	82.857

The result of descriptive statistical analysis of the post-test scores of students who were taught by CIRC Method showed that of the 28 students, the highest and lowest scores were 82.857 and 5.714. The average post-test score of students was taught by CIRC Method was 52.244, with a standard deviation of 20.979.

The results of descriptive statistical analysis of the post-test scores of students who were taught by CIRC Method showed that the highest and lowest scores for 11 students with high self-efficacy levels were 82.857 and 34.286, with a mean of 63.636 and standard deviation was 12.262. The highest and lowest scores for 15 students with moderate self-efficacy were 71.429 and 5.714, with a mean and standard deviation of 42.476 and 22.828. Whereas, for the post-test scores of students with low self-efficacy levels, both of them got 62.857.

Statistical tests were carried out on the test results based on the self-efficacy level. The statistical test consists of the mean difference test to determine the differences before and after the treatment. The researcher first conducted a prerequisite test to perform the mean difference test, namely the normality and homogeneity test.

Normality and homogeneity tests were done to determine whether the data is equally distributed and has the same variance (homogeneous) or not. If the data meet the requirements for normality and homogeneity, the average difference test is performed using the T-test. Meanwhile, if the data is regular but not homogeneous, the mean difference test for independent data uses the T-test. However, homogeneity is not the main requirement for paired data, so it can still be continued using the T-test for paired samples (paired sample T-test). The average difference test uses the non-parametric test with the Wilcoxon test for data that do not meet the formality requirements. The normality test of CIRC Method in terms of the self-efficacy level are as follows.

Table 13. The Normality Test of CIRC Method at all Self-efficacy Level

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Pre-test_CIRC	.198	28	.006	.919	28	.032
Post-test_CIRC	.235	28	.000	.880	28	.004

a. Lilliefors Significance Correction

Because of the value of Sig. = 0.032 < 0.05 and 0.004 < 0.05 which means that both the pretest and post-test data are not normally distributed. Therefore, statistical testing will be continued with non-parametric statistical tests using the Wilcoxon test. But before that, the normality test of CIRC Method per Self-Efficacy was carried out.

Table 14. The Normality Test of CIRC Method per Self-Efficacy

	Self Efficacy	Kolmogorov-Smirnov ^b			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Pre-test CIRC	Moderate	.143	15	.200*	.940	15	.388
	High	.235	11	.091	.852	11	.045
Post-test CIRC	Moderate	.214	15	.063	.897	15	.085
	High	.207	11	.200*	.896	11	.163

* This is a lower bound of the true significance.

a. Pre-test_CIRC is constant when level_SE_CIRC = SE Low. It has been omitted.

b. Lilliefors Significance Correction

c. Post-test_CIRC is constant when level_SE_CIRC = SE Low. It has been omitted

The hypothesis for the CIRC Method normality test results is as follows:

H0: Samples come from populations that are normally distributed

H1: Samples come from populations that are not normally distributed

The test criteria are if the value is Sig. > α then H0 is accepted. Conversely, if the value is Sig. > α then H1 is accepted. Using the Shapiro-Wilk test and the significance level α = 0.05 for learning with the CIRC Method at all self-efficacy levels, it is known that for the pre-test and the post-test, the Sig. = 0.032 < 0.05 and Sig. = 0.004 < 0.05, which means that both data are not normally distributed. Therefore, statistical testing will be continued with non-parametric statistical tests using the Wilcoxon test. The normality test results for the CIRC Method in terms of self-efficacy are presented in the following table.

Table 15. Normality Test Results Learning with the CIRC Method in terms of the Self-Efficacy Level

Self-efficacy level	Test	N	Mean	Sig.	Result (H ₀)
High	Pre-test	11	62.597	0.045	Denied
	Post-test		63.636	0.163	Accepted
Moderate	Pre-test	15	37.714	0.388	Accepted
	Post-test		42.476	0.085	Accepted
Low*	Pre-test	2	34.286	-	-
	Post-test		62.857	-	-

* for students with a Low-level self-efficacy, because N = 1, the value is constant, so the test is ignored.

From [Table 15](#) it can be concluded that statistical testing of the CIRC Method in terms of the self-efficacy level will be followed by a non-parametric test, the Wilcoxon test, for the high self-efficacy level. Meanwhile, for the moderate self-efficacy level, the test was continued with the homogeneity test.

The homogeneity test is carried out to assume that the research sample comes from the same or homogeneous conditions. The homogeneity test is carried out by investigating whether the two samples come from populations that have the same variance or not. The data homogeneity testing using the help of SPSS 20 software, carried out using the Levene statistical test with the following steps:

- a. Formally writing a hypothesis as follows:
 - H₀: Both samples come from populations that have homogeneous variances
 - H₁: Both samples come from populations that have a variance that is not homogeneous.
- b. Performed a test with a significance level of $\alpha = 0.05$.
- c. Comparing the significance level $\alpha = 0.05$ with the significance level obtained with the following criteria:
 - If the Sig. (p-value) $< \alpha$ ($\alpha = 0.05$), then H₀ is rejected, meaning that the sample comes from a population with a non-homogeneous variance.
 - If the value is Sig. (p-value) $\geq \alpha$ ($\alpha = 0.05$), then H₀ is accepted, meaning that the sample comes from a population with a homogeneous variance.

Table 16. The Homogeneity Test of CIRC at Moderate Self-Efficacy Level

Levene Statistic	df1	df2	Sig.
9.621	1	28	.004

H₀: There is no difference in the variance of the students' pre-test and post-test scores

H₁: There is a difference in the variance of the students' pre-test and post-test scores

Test Criteria, If Sig. > 0.05 , then H₀ is accepted. On the other hand, if Sig. < 0.05 , then it is not a sufficient condition to accept H₀.

From the data above, it is known that Sig. = 0.004 < 0.05 , which means that the data has a different variance (not homogeneous). The homogeneity test of CIRC Method results for moderate self-efficacy level was Sig. = 0.04 $< \alpha$. Thus, it can be concluded that the data have different variances (not homogeneous). Because the data is not homogeneous and the data is data from paired samples, testing the mean of the CIRC Method at the moderate self-efficacy level, the T-test is used.

After testing the learning outcomes CIRC Method, both the normality test and the homogeneity test, the next step is to test the mean difference. This test is conducted to determine whether the implementation of CIRC Method could effective on enhancing students' reading HOTS or not. Because the parametric test assumptions were not fulfilled for CIRC Method test results at all self-efficacy levels, the mean difference test used the non-parametric Wilcoxon test. Those results are presented to answer the research questions and research hypothesis as well.

The Wilcoxon Test results for the CIRC Method are presented in the following [Table 17](#) and [18](#).

Table 17. Rank on CIRC Method Testing Using the Wilcoxon Signed Rank Test

Rank	N	Mean Rank	Sum of Ranks
Negative Ranks	12 ^a	10.88	130.50
Positive Ranks	15 ^b	16.50	247.50
Ties	1 ^c		
Total	28		

From [Table 17](#), the information for the values obtained are as follows.

- a. The N value of the Negative Ranks group is 12, which means that 12 students have higher pre-test scores than the post-test.
- b. The N value of the Positive Ranks group is 15, which means that 15 of the 28 students have a higher post-test score than the pre-test.
- c. The N value of the Ties group is 1, which means that there is one student who has the same pre-test score as the post-test.

For decision making, the following hypothesis is made:

H₀: There is no difference increase of students' reading HOTS in CIRC Method

H₁: There is a difference increase of students' reading HOTS in CIRC Method

Table 18. Wilcoxon Test Results on the CIRC Method

Test Statistics	
Z	-1.407 ^b
Asymp. Sig. (2-tailed)	.159

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

The test criteria are if the value is Sig. > α ($\alpha = 0.05$) then H_0 is accepted. Conversely, if the value is Sig. > α then it is not sufficient to accept H_0 . From the test results presented in Table 18, on the Asymp line. Sig. (2-tailed) shows that the Sig. = 0.159 > α , thus, H_0 is accepted. So it can be concluded that in CIRC Method, there is no difference increase in students' reading HOTS at all self-efficacy levels. In other words, the CIRC Method cannot increase students' reading HOTS.

However, because this study involves a moderate variable, namely self-efficacy, it is necessary to review the increase of students' reading HOTS based on self-efficacy. Because the results of the parametric test assumptions were not fulfilled for the CIRC Method at a high self-efficacy level, the mean difference test used the non-parametric test, the Wilcoxon Test. Whereas for the moderate self-efficacy level, the test was carried out with the T-test. The Wilcoxon test results for the CIRC Method at a high self-efficacy level are presented in Tables 19 and 20.

Table 19. Rank of CIRC Method Testing Using the Wilcoxon Signed Rank Test in Term of Self-Efficacy

Rank	N	Mean Rank	Sum of Ranks
Negative Ranks	6 ^a	5.50	33.00
Positive Ranks	5 ^b	6.60	33.00
Ties	0 ^c		
Total	11		

From Table 19, the information for the values obtained is as follows.

- The N value of the Negative Ranks group is 6, which means that six students at the high self-efficacy level got higher pre-test scores than the post-test.
- The N value of the Positive Ranks group is 5, which means that five students at the high self-efficacy level have higher post-test scores than the pre-test.
- The N score of the Ties group is 0, which means that none of the 11 students at high self-efficacy have the same pre-test score as the post-test.

For decision making, the following hypothesis is made:

H_0 : There is no difference increase of students' reading HOTS in CIRC Method

H_1 : There is a difference increase of students' reading HOTS in CIRC Method

Table 20. Wilcoxon Test Results on the CIRC Method in terms of Self-Efficacy Level

Test Statistics	
Z	.000 ^b
Asymp. Sig. (2-tailed)	1.000

a. Wilcoxon Signed Ranks Test

b. The sum of negative ranks equals the sum of positive ranks.

The test criteria are if the value is Sig. > α ($\alpha = 0.05$) then H_0 is accepted. Conversely, if the value is Sig. > α then it is not sufficient to accept H_0 . From the test results presented in Table 20, on the Asymp line. Sig. (2-tailed) shows that the Sig. = 0.1 > α . Thus, H_0 is accepted, so it can be concluded that there is no difference increase of students' reading HOTS in CIRC Method at a high self-efficacy level.

The result of the CIRC Method means difference test in moderate self-efficacy level with T-test obtained Sig value. = 0.329 > 0.05. Based on the test criteria, H_0 is accepted if the value is Sig. > α (0.05), so it can be concluded that there is no difference increase of students' reading HOTS in CIRC Method at the moderate self-efficacy level.

The Effect of Jigsaw Method on enhancing Students' Reading HOTS with Different self-efficacy levels

From the quantitative data analysis of the findings for the first experimental class receiving Jigsaw Method, there was a difference increase of students reading HOTS who get the implementation of Jigsaw Method. However, the increase of students' reading HOTS only occurs the low self-efficacy level.

In the implementation of Jigsaw Method, it is expected that students' reading HOTS can increase as activities within the method support. Unfortunately, in the middle of the research, Covid 19 pandemic outbreak and teaching-learning consequences should be carried out online. The sudden implementation of online learning makes the Jigsaw Method implementation unable to be implemented optimally. Both students and teachers experienced many obstacles and difficulties. The unpreparedness of the online implementation of the Jigsaw Method is suspected as the cause of not increasing student scores on the post-test. However, although the students' post-test did not increase significantly, the implementation of the Jigsaw Method fulfilled the elements of the Cooperative Learning Strategy, which was considered to be able to improve students' reading HOTS. The development of HOTS as the top end of Bloom's taxonomy using Jigsaw Method is expected to make students think broadly, apply and implement those skills and knowledge to be able to respond to a new challenge (Syafryadin et al., 2021; Harahap & Astrid, 2021; Heong et al., 2011; Indriyana & Kuswando, 2019; Brookhart, 2010).

In respect of the implementation of Jigsaw Method on enhancing students' HOTS, even though the result of statistical description showed that the students' improvement only occurs at the low self-efficacy level, the data from the observation sheet and field notes showed that students got benefits from the implementation of Jigsaw Method and even develop their HOTS. Here is the elaboration of the cooperative elements increase in the implementation of Jigsaw Method.

1. Positive interdependence

Positive interdependence was developed through role, material, and objectives interdependence. In Jigsaw Method, the elements were established by assigning different roles to each group member. Two elements were built by the implementation of Jigsaw Method, namely material and roles of interdependence. Materials interdependence is built when a distribution of material must be mastered by each group member, while interdependence roles are formed when sharing tasks between members and as leaders. In groups with different levels of self-efficacy, it can be observed that not all have a different spirit in doing a given task or fulfilling their role. However, because each member is given responsibility, they do their given role and do the work part.

2. Face-To-Face Promotive Interaction

In Jigsaw Method, face-to-face promotive interaction occurs when members discussed in the expert group return to the homegroup and present their findings. Other members can confirm this, and then their work is combined to complete the group assignment. The peer teaching process and peer assessment during the activity are continuously required to get feedback from their friends. Dignen (2014) in Klimova (2015) states that feedback is an essential communication skill, both outside and inside the classroom because it is around all the time; it is just another word for compelling listening.

3. Individual and Group accountability

This element involves students' understanding which will be held accountable for their contributions to the group, which free-loading will not be tolerated, and which everyone must contribute. This element was built by giving each member a task. Even though working in a team, no one does not contribute to teamwork. For that, each member must write down what he did and report what he did in contributing to group assignments. In implementing Jigsaw Method, individual and group accountability could be observed through peer discussion. After peer discussion was conducted, students are allowed to make presentations to share their findings with classmates. By doing class presentations they show the responsibility of their workgroup. A presentation is a means of communication that can be applied to various speaking situations, such as talking to a group of people. Presentation skills are necessary for a workplace to communicate the relevant information clearly and effectively (Srinivas, 2018).

4. Interpersonal and Small Group Social Skills

These elements required each member to learn to work cooperatively using effective communication with group members with different knowledge and learning styles. They should have leadership skills, decision-making, and conflict management (Johnson & Johnson, 2009; Sadeghi, 2012). In implementing the Jigsaw Method, it is expected that students' HOTS can increase because many activities built interpersonal and small group social skills. One of them is a discussion group activity. In discussion groups, interaction can lead to conditions in which students analyze, evaluate, and create something. Implementing group discussions can improve students' critical thinking by maximizing discussion techniques to discuss peers (Samelian, 2017). In

implementing Jigsaw Method, discussions are held in small groups of about four to 5 people.

5. Group Processing

This key element refers to the process of evaluation and assessment of group work. It could be described as a formative assessment that focuses on students' feedback on the learning process, including the students' reflection on what they still need to do to accomplish their objectives. Group processing occurs when members have time and procedure to evaluate the group work process in deciding supportive and unsupportive action. Assessment does not mean to judge whether students are failing or successful. Assessment should be designed to improve and educate student performance, not merely audit students' work and find their mistakes (Wiggins, 1998 in [Grumilah & Aji, 2016](#)).

The Effect of CIRC Method on enhancing Students' Reading HOTS with Different self-efficacy levels

From the quantitative data analysis of the findings for the second experimental class receiving CIRC Method, no difference increase of students HOTS gets the implementation of CIRC Method. To analyze the effect of the CIRC Method, a normalized gain value (N-Gain) was tested for CIRC Method, which was explicitly seen from high, moderate, and low self-efficacy levels.

From the results of the Wilcoxon test, it was concluded that there was no difference in the increase in students' HOTS who received the CIRC Method implementation at high, moderate, and low self-efficacy levels. This finding contradicts many studies and theories about the CIRC Method, suggesting that this method can improve students' reading of HOTS. Even though the reading HOTS test result did not show students' improvement, data from the observation sheet and field notes showed that students get many benefits and even develop their reading HOTS looking from cooperative learning elements. Here is the elaboration of the cooperative elements increase in the implementation of Jigsaw Method on enhancing students' reading HOTS.

1. Positive interdependence

The division of tasks (roles interdependence) in the CIRC Method is carried out when students divide tasks to answer questions from the text they read and also when looking for the meaning of new or challenging words from the text. Thus, CIRC's positive interdependence is formed when students share roles to find the implicit and explicit meaning.

Materials interdependence is built when a distribution of material is mastered by each group member, while interdependence roles are formed when sharing tasks between members and as leaders. Meanwhile, the goal of interdependence was structured to implement those three strategies by achieving the group's goal to complete the assignment. To achieve the group goal, all members must know the group goals. Therefore, positive goal interdependence is crucial, as it allows learners to perceive that their goal is positively linked to the goal of their partners ([Johnson & Johnson, 2009](#); [Sharan, 2010](#); [Slavin, 1990](#) in [Buchs & Butera, 2015](#)).

2. Face-To-Face Promotive Interaction

In CIRC, face-to-face promotive interaction occurs when group members confirm their friends' answers to questions in the text and discuss unfamiliar terms. Face-to-face promotive interaction occurs when members understand the reading text or song's text, primarily to determine detailed information. Students try to find explicit and implicit information in CIRC by working in groups and discuss with other group members. In CIRC Method, there is a peer teaching process and peer assessment during the activity where students got feedback from their friends. [Dignen \(2014\)](#) in [Klimova \(2015\)](#) and [Astrid et al \(2021\)](#) state that feedback is an essential communication skill, both outside and inside the classroom because it is around all the time; it is just another word for compelling listening.

3. Individual and Group accountability

In implementing CIRC Method, individual and group accountability could be observed through peer discussion. After peer discussion was conducted, students are allowed to make presentations to share their findings with classmates. By doing class presentations they show the responsibility of their workgroup. Furthermore, [Alshare & Hindi \(2014\)](#) assert that presentation skills are very much useful for English language learners as they provide an opportunity to practice not only almost all language system areas such as grammar, discourse, vocabulary, and phonology, but students also practice four language skills in the particular contextual topic. By doing the presentation, students will increase their self-confidence. Even though, at first, the students made their presentations feeling awkward, gradually, their abilities would develop.

4. Interpersonal and Small Group Social Skills

Activities in CIRC Method triggers problem-solving (integrative) negotiations. Conflicts of interest frequently and unavoidably take place when one person works cooperatively with another. In implementing CIRC Method, students become more concerned with the phenomena that occur around them. As [Sudarwati \(2019\)](#) stated, learning should also be linked to students' natural environment. In HOTS learning, for example,

in analyzing fact versus opinion within the text, the students are asked to find out contradictory or debatable topics that the society engages with to discuss. Students can implement the theory they have in everyday life encounters, which demands their effort to solve the problem appropriately. This is in line with Anderson et al. (2001), who stated that HOTS could be achieved when students try to understand and integrate their knowledge with experience. In CIRC Method, students learn cooperatively rather than competitively since there are no intentions of a win-lose result. Saint (2019) is in his opinion that learning cooperative brings about better communication skills, interpersonal skills, knowledge-seeking skills (Khemmani, 2015), and the ability to succeed in work life and to live in the society (Har, 2013).

5. Group Processing

Peer assessment is carried out when learning occurs. For example, when conducting group discussions, students assess each other's work done by their friends. This assessment is done by asking questions, providing feedback, or providing input. This is done so that group work can be appropriately completed following the learning objectives. Furthermore, continuous peer assessment activities will enable students to become autonomous learners. O'Malley and Pierce (2016) stated that peer assessment assesses students' work, products, or learning processes, by classmates. Jamilah (2014) asserts that self-and peer-assessment can be an alternative way to assess students learning. Furthermore, Brown and Abeywickrama (2010) argue that self and peer-assessment can be implemented in language classrooms such as oral production, listening comprehension, writing, and reading.

CONCLUSION

Based on the results of the data analysis answering the research questions, some points can be concluded: Firstly, based on statistical calculations, the implementation of the Jigsaw Method in students with different self-efficacy only enhances students' reading HOTS score in low self-efficacy level. The students who were taught using Jigsaw Method in moderate and high self-efficacy levels did not increase their reading HOTS ability. Secondly, based on statistical calculations, the implementation of the CIRC Method in students with different self-efficacy did not enhance students' reading HOTS in all self-efficacy level students. However, even though the result did not significantly enhance students' high order thinking skill, the implementation of Jigsaw and CIRC Method in its effort to enhance students' reading HOTS with different self-efficacy levels fulfilling the five Cooperative Learning Strategies elements. The five Cooperative Learning Strategies elements are positive interdependence, face-to-face promotive interaction, individual and group accountability, interpersonal and small group social skills, and group processing.

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