

## **The Effect of Jigsaw Method on Reading Comprehension in Non-Major English Basic Science Students**

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### **Abstract**

This quasi-experimental research aimed at identifying the effect of Jigsaw Method on students' reading comprehension in non-major English basic science students at University of Bengkulu. The sample of this research was 78 students from nursing class who took general English courses at Bengkulu University at Academic Year 2022/2023, the students were divided into experimental group (38) from class 2A Nursing and controlled group (40) from class 2B Nursing. The data were collected by using a valid and reliable test which consists of 30 items which represent 5 aspects of reading comprehension that is main idea, detail questions, references, inference, and vocabulary. Furthermore normality and homogeneity data has been checked before the data were analyzed statistically. The paired sample test results indicate that there was a significance improvement (0.000) in students reading comprehension in experimental group, but no significance improvement were found in controlled group (0.735). Furthermore, the result of independent sample test revealed that the reading comprehension achievement of the students in experimental group were significantly (0.000) better than that of those in controlled group. The result showed students who study using expert groups were able to discuss freely with one another. This result suggests that Jigsaw Method was appropriate to be implemented to improve reading comprehension for students in non-major English basic science.

**Keywords:** Cooperative learning, Jigsaw method, reading comprehension

### **Introduction**

Reading is a skill that is closely related to understanding. Yiğit and Durukan (2022) said that reading comprehension is an understanding that is able to facilitate

an individual's daily life through a text. Reading is an ability to draw meaning from the pages of the book and to interpret the information contained in the book appropriately. That means reading comprehension were able to obtain the information contained in the reading must go through an understanding. Thus, without understanding and interpreting what the students read, it is just as useless.

In learning English as Foreign Language (EFL), reading skill is very helpful for EFL students. Öztürki (2018) stated that reading is very helpful for developing foreign language learning skills because the meaning and value of a reading skill is very clear and real. From this statement, it can be concluded that language and reading have a very close relationship. By reading we were able to expand knowledge about language and other knowledge outside of language. According to Herman, Sibrani, & Pardede (2020), reading is essential due to the fact it is able to help college students to gain new information which will recognize what they read and to growth their knowledge.

However, Indonesian students' reading literacy was still very low. It can be seen from the Program for International Student Assessment (PISA) data. PISA is one of the assessment studies engaged in the fields of mathematics, science and reading ability at an international level and this study was organized by the OECD, the aim is to evaluate the education system at an international level. Based on the results of the PISA survey in 2018, especially on reading, the mean score for reading is (487), while the reading score for Indonesia is (371). This means that for the average level in reading, Indonesia was still behind (116) points. Which means it was still quite far behind. Indonesia was in the lowest 5th place, which is 72nd out of 77 countries. Even Indonesia was lagging behind several other Asian countries such as Singapore with a score of (549), Malaysia with a score of (415), and Thailand with a score of (393). It can be seen that the students' reading level was still very low. In addition, other data was data from the Progress in International Reading Literacy Study (PIRLS). PIRLS is an international research study especially on literacy in elementary school children. PIRLS (2016) provides that Indonesia is ranked 45th out of 48 participating countries

From some of these data, it is known that students in Indonesia used Indonesian to have low reading literacy. Students can only read but have not been able to understand the meaning of what is read. This means that students' reading comprehension using English is also still low, even though English is a foreign

language for students in Indonesia. Afzal (2019) stated that students generally face difficulties when learning English because the students' vocabulary is less extensive. Lack of vocabulary is what makes reading in English more difficult. In addition, According to Ulutas and Kaya (2022), the main idea is a brief statement or a summary, the main idea is generally more focused on the summary, which includes all texts. However, there are still many students who have not been can't find one of the aspect of reading comprehension that is main idea from the text.

Specifically, the study also found difficulties for non-major English students in Bengkulu University. When did reading comprehension, students were unable to understand the text they read, because they did not master the vocabulary of the text, apart from vocabulary students also could not find the main idea of the text they read. This can be proven by the average score of students in the reading comprehension test getting a score between 60-70 which at Bengkulu University still got a range between B- and also B. So that it is able to be stated that the students' reading comprehension remains low.

To overcome this problem, an effective method is needed to fulfill reading for students, one of which is using the Jigsaw method. Adams (2013) state that Jigsaw is one of many cooperative learning methods that have been developed by Elliot Aronson in 1971. Jigsaw is able to put forward two things, namely academics and social goals. In line with this, Nurbianta & Hana (2018) state that in order to carry out innovative and cooperative learning, students can use the Jigsaw method, because the Jigsaw method is able to provide a very large role for students. From some of the experts' opinions, it can be concluded that One of the methods from cooperative learning, in which students formed small groups and students who understand faster, help other friends who are still quite slow in understanding a reading is a Jigsaw Method.

One of the benefits of the Jigsaw method was that students play a major role in the learning process, because during the learning process all learning material mastered by students together, so that in the learning process students influenced their role. According to Herman, Sibrani, & Pardede (2020), the Jigsaw method can help students feel more comfortable because they work in groups, and then students free to discuss with their group mates because they discuss without anyone judging them, besides that college students have a new fresh state of affairs within the study room. According to Adams (2013), the Jigsaw method has the benefit of

students being able to collaborate with one another, because students become active students in the learning process. Students collaboratively exchange ideas with one another. From some of the experts' opinions, it may be seen that the Jigsaw has a great effect on college students. Because students were able to be collaborative, student's comfortable working with teams, students free to discussed, and experienced new things in class.

The study conducted the Jigsaw method for university level at the Bengkulu University because the study has asked several lecturers and several students at Bengkulu University. Lecturers have never used the Jigsaw method, and students have never experienced the use of the Jigsaw method. So that the use of the Jigsaw method has almost never been done at the University of Bengkulu, besides that the student level is very suitable for implementing the Jigsaw method, because at the student level they are already able to have good discussions so that the Jigsaw is very suitable used. The Jigsaw method is also suitable for reading comprehension material, because students could discuss reading material with each expert group. Reading material that taught to students is about reading comprehension or topics in general, so that later they can explain the material to the initial group.

Several previous studies have found that the Jigsaw method become powerful in improving college students' reading comprehension. Sinaga (2020) found that Jigsaw teaching method extensively impacts the students' capability in studying comprehension because students must understand and understand the entire content in the text. Moreover, Sabbah (2016) also found that the use of the Jigsaw method had a positive impact on student academic achievement because in this study the Jigsaw has the benefit to empower students and can be responsible for their assignments. In addition, being able to encourage peers and make learning fun.

Based on these findings, this study conducted a quasi-experimental method study, but there is a gap between the study and previous studies that are subject to different from the previous studies. In previous studies, this study also found that the Jigsaw method was less effective than other methods, but because of its function, This study still choose the Jigsaw method in this study. In addition, there were more students from abroad as subjects for the study, so this study wanted to conduct research on the subject of Indonesian students, especially Bengkulu University

students. The subjects of this study were non-major English basic science at Bengkulu University academic year 2022/2023 students.

Based on the explanation above, this study has several research questions; 1. Was there any significant improvement in reading comprehension of non-major English basic science students after they are taught using the Jigsaw method? 2. Was there any significant improvement in reading comprehension of non-major English basic science students who are not taught using the Jigsaw method? 3. Was there a significant difference in reading comprehension achievement of students who are taught using the Jigsaw method and those who are not? Based on the research question, the objectives of the study are: 1. To find out whether there was any significant improvement in reading comprehension of non-major English students after they are taught using the Jigsaw method. 2. To find out whether there was any significant improvement in reading comprehension of non-major English students who are not taught using the Jigsaw method. 3. To find out there was a significant difference in reading comprehension achievement of students who are taught using the Jigsaw method and those who are not.

### **Research Methodology**

This research was a quasi-experimental research. According to Creswell (2014), experimental is the process of evaluating a hypothesis in order to determine whether or not the hypothesis is influencing the outcome or variable. In this experimental research is divided into several parts such as true experimental and quasi experimental. True experimental was research that focused more on science and true experimental variables could be controlled. Quasi-experimental was research where the variables could not be controlled.

The population was all active students of Non-major English basic science students at University of Bengkulu at Academic Year 2022-2023 which total was 19 classes (634 students). Meanwhile the sample took two classes in Non-major English Student in Bengkulu University Academic Year 2022/2023. This study took 2 classes (78 students), namely *D3 Keperawatan*. This study chose the *D3 Keperawatan* because there was access to use the class, *D3 Keperawatan* students had never been taught using the Jigsaw method, the number of *D3 Keperawatan* was sufficient. For these reasons, these 2 classes were chosen as the sample in this study.

In this study, the instrument of the research was a test. Test with a form of multiple choices. This means that the test given by the study provides data about the students' reading scores as a numerical value. The study used the quasi-experimental, so study used pretest and posttest. The test was adapted according to the TOEFL book from Philipps in 2001 and 2004. Some of the questions have been changed, especially in the reference section. The test was carried out twice, namely pre-test and post-test.

Data collection was a standard and systematic procedure for retrieving the required data. For this study, study conducts pre-test, treatment, and post-test in data collection. Pre-test consists of 30 multiple choice questions based on the reading comprehension. The treatment used the Jigsaw method in 6 meetings in experimental class, meanwhile used the conventional method (teacher-based learning) in controlled class. The last method used in collecting data is giving a post-test. Post-test is given to measure how a ways the treatment done can growth students' reading comprehension. The questions on the post-test contained 30 questions that are in accordance with the reading comprehension.

There are validity and reliability for the instrument. According to Rusydi and Fadhli (2018), the validity of the instrument is closely related to a suitability and accuracy between the instrument as a measuring tool and the object being measured. The validity based on content validity and construct validity. In content validity, this study carried out validity through expert judgment. In construct validity, the study did a try out, try out here means the study provided reading comprehension questions that are not from the sample. According to Rusydi and Fadhli (2018), measurements that have high reliability are referred to as reliable measurements. Reliability testing tools can be run on Cronbach's Alpha through SPSS 23 version.

In analyzing the data, the study used a normality and homogeneity test and t-test. First step was found the normality and homogeneity test used SPSS 23 version. Second was found the t-test, there was two t-test the first was paired sample t-test and independent sample t-test. The study calculated t-test with the formula and used SPSS version 23.

## Findings and Discussion

### Findings

This section divided into three parts. First, showed the result of the effect of Jigsaw method on reading comprehension. Second, showed the effect of conventional method on reading comprehension. Third, showed result of the difference between experimental class and controlled class . After showed the result of the data, there are found that Jigsaw Method gave positive effect for reading comprehension. The result of the data as follow:

#### The Effect of Jigsaw Method on Reading Comprehension

The study compared the result of pre-test and post-test used paired sample test used the formula or used SPSS version 23. From these calculations it showed that the result of t-count was 12.08 and its significance was 0.000. It is said to be significant if the result is less than 0.005 ( $0.000 < 0.005$ ). In addition, it is also said to be significant if the results from tcount were greater than ttable. So that  $12 > 2.026$  means that the result of tcount were greater than ttable. Table 1

The Result of Paired Sample Test for Experimental Class

Experimental Class	Mean	Mean Difference	Standard Deviation	T Value	Sig.
Pre-test	56.28	-22.06	11.246	-12,087	.000
Post-test	78.34				

As presented in table, seems tcount was higher than ttable and significance value was less than 0.005. The conclusion there was a significance improvement of reading comprehension achievement after they are taught using Jigsaw method.

#### The Effect of Conventional Method on Reading Comprehension

The study compared the result of pre-test and post-test using paired sample test used the formula or used SPSS version 23. From these calculations it showed that the result of t-count was 0.341 and its significance was 0.735. It is said to be significant if the result was less than 0.005 ( $0.735 > 0.005$ ). In addition, it is also said to be significant if the results from tcount were greater than ttable. The result was  $-0.341 < 2.022$ , it means that the result of ttable were greater than tcount.



Table 2

The Result of Paired Sample Test for Controlled Class

Controlled Class	Mean	Mean Difference	Standard Deviation	T Value	Sig.
Pre-test	49.125	0.625	11.595	.341	.735
Post-test	48.5				

As presented in table 4.5, seems tcount was lower than ttable and significance value was more than 0.005, the conclusions there was no significance improvement of reading comprehension achievement after students are taught using Jigsaw method.

### The Difference between Experimental Class and Controlled Class

The post-test results for the experimental class and the controlled class were compared using an independent sample test. Data is categorized as having a significant difference if the significance value is less than 0.005. The result of the t-count was 19.5 and the significance was 0.000. This means that the value is less than 0.005 ( $0.000 < 0.005$ ). And tcount was greater than ttable ( $19.5 > 2.10$ ). The results of the independent sample test can be seen in table below.

Table 3

Independent Samples Test

Group	Mean	Mean Difference	T Value	Sig.
Post-test of Experimental Class	78.34	29.84	-19.5	.000
Post-test of Controlled Class	48.5			

Based on the table, it appears tcount was better than table and significance value become much less than 0.0.5. In conclusion, there has been a huge difference in college students' ability in reading comprehension inside the experimental class and the controlled class. The post-test consequences of the



experimental class and the controlled class the imply difference were 29.84 points. The outcomes had been higher within the experimental class, in different phrases, after being taught with the Jigsaw method, student progress increased drastically as compared to the controlled class.

## **Discussion**

After being given treatment to the sample, there was an increase in the reading comprehension ability of students in the two classes by 10.72 points (see table 4.3). Unfortunately, the average results on the post-test of all samples still showed that students were still at a score of 63.42 (standard score C+ in Bengkulu University). The cause of the low score was due to lack of student motivation because it can be seen students seemed less enthusiastic when doing assignments so that the level of student motivation decreases. According to Kızıtaş (2022) reading motivation is something that can influence a level of student understanding for student academic success. In this research, students seemed less interested in English texts so that between one student and another student did not build motivation in a positive direction. Ratnawati (2017) stated that the factors that influence learning difficulties come from the students themselves or internal factors. In this research, students did not seem too interested with English Subject, causing their reading comprehension in English subjects to be lacking.

More specifically, the interpretation of the results obtained from the two classes, namely the experimental class and the controlled class, explained in more detail as follows:

### **The Effect of Jigsaw Method**

After being given treatment, there was a significant increase in students' reading comprehension achievement. These results support previous research which also found the benefits of the Jigsaw method to improve students' reading comprehension. As for several factors that benefit from the Jigsaw method in the experimental class could develop social values for students, because students were able to discuss freely with their both group that is the original group and expert group. Supported by the opinion according to Karacop and Diken (2017), the Jigsaw method is a method in which students must be responsible for the material given by the teacher.

In this research, it was found that learning became more structured because students did not have to read all of the material, instead students only focused on the material they had. Students had the responsibility to be able to understand the material given to them and be able to explain it to other group friends. So that students' reading comprehension became better because students were only

required to understand the material, other material explained to other friends. This is also supported by the opinion of Kardaleska (2013) which stated that the active learning technique of the Jigsaw method can help students learn to be more structured and responsible. Because students must master at least one material given by the teacher to them.

With the Jigsaw method, students were able to do assignments on time, because in the group there is a group leader, a group leader who helps the progress of learning in order to encourage other friends to be able to do assignments on time. And also there was expert group that helped students to do their assignments. It can be seen in this research, every meeting that the task is carried out is able to be collected on time without having to add time. According to Yue, Feng, & Ye (2021), each group needs someone who is able to encourage other students, and remind other students' assignments so that group work can run effectively. Because of the benefits of the Jigsaw method, it was assumed that these factors were the cause of the increased in reading comprehension.

### **The Effect of Conventional Method**

After being given treatment for six meetings, there was no significant increase in students' reading comprehension achievement after being taught using the conventional method. As for some of the factors that cause no increase in reading comprehension was the lack of motivation of students in learning English. Each student certainly has an interest in a different field of science. Not all like English and choose English majors. The students' lack of interest in English affects students' motivation in reading comprehension. According to Kızıltaş (2022) reading motivation is something that can influence a level of student understanding for student academic success. If students are not interested in the material, then students did not have the motivation to understand the material.

Additionally, in this research other factors were also found, namely because students studied and worked individually. Students only focus on themselves, students did the assignments given individually so the results obtained were not

optimal. In the controlled class, did not provide collaborating activities, so if students had difficulties directly asked the teacher. Meanwhile for some who didn't ask, have difficulty understanding the text. Therefore, it was more necessary to work collaboratively so that students were able to understand reading comprehension. According to Afandi, Chamalah, & Wardani (2013), cooperative learning is group learning, in group learning students are able to provide opportunities for students to

interact and exchange ideas with each other about the material provided by the teacher.

In the conventional method, there was nothing to support students' reading comprehension, as in the Jigsaw method, there was an expert group. Whereas in the conventional method there was no groups. This is also one of the aspects that affect reading comprehension. Because in the conventional method students worked on quite a lot of material independently, while the expert group in the Jigsaw method really helped students because students were able to understand the same material as other friends. Karacop and Diken (2017) said that the expert group in the Jigsaw method really helps students to improve reading comprehension. It is assumed that these factors are the cause of the there was no significance reading comprehension for controlled class.

### **The Difference between Experimental Class and Controlled Class**

After compared the post-test outcomes of the experimental class and the controlled class, it seems that the experimental class post-test turned into significantly different from the controlled class post-test. This shows that there has been a significant difference among reading comprehension college students who're taught with the Jigsaw method and college students who are not taught with the Jigsaw method or use conventional methods. There are some factors that made Jigsaw method was effective.

The first factor is that by using the Jigsaw method, students were able to instill social values so that students were able to socialize with their group mates. Students were able to discuss the same material to the expert group, while all reading comprehension material explained to the original group. So that it cause positive motivation between one student and another. Whereas in the conventional method, students worked on assignments individually so that there was no social value embedded, besides that by did the task individually made students not interested in learning reading comprehension, so that there was no positive

motivation embedded in students. According to Kızıltaş (2022) reading motivation is something that can influence a level of student understanding for student academic success.

The second factor was that by using the Jigsaw method, students were able to learn in a structured and responsible. Jigsaw method requires students to at least understand one material, and must be explained to their friends. If students felt the difficulties in learning, there were group friends who are able to overcome these difficulties. In that way students were able to learn in groups and learn more structured and effective. Whereas in controlled class, students did learn individually so that students must be able to master all the material, if there were difficulties students directly asked the teacher, but for students who do not asked feel a lack of understanding of reading. Therefore, learned in groups was more important than worked alone. Herman, Sibrani, & Pardede (2020) said that cooperative learning is an instruction which involves students to be able to work in groups in order to be able to achieve common goals.

The third factor was that there was an expert group in the Jigsaw method for the experimental class. Expert group means that students learned about the same material. With expert group, students were able to understand more text so that it increased reading comprehension. Students exchanged idea about the material they got, and in the end students explained the material from the expert group to the original group. While in the controlled class there was no expert group, so they must be able to master all the material independently. Karacop and Diken (2017), said that the expert group in the Jigsaw method really helps students to improve reading comprehension.

After discussing the three main focused in this research regarding to: First, the effect of Jigsaw method. Second, the effect of conventional method. Third, the difference between experimental class and controlled class. This research could reflex the Jigsaw method as follow: the use of the Jigsaw method was suitable to be carried out at the student level because to discuss with friends students were able to discuss well so as to be able to produce a good and correct agreement about the material being carried out. The use of the Jigsaw method in the expert group procedure was very helpful for students in worked on questions, because students were able to discuss and focus on the material they got. They were able to explain the results of the discussion back to their original group friends. The use of the Jigsaw



method was able to make students work in a structured and timely manner, because students have the same portion of assignments so that the tasks given can be carried out on time. Whereas in the conventional method students failed to comprehend the text because students only focus independently. Students work on the questions individually, this is what makes students fail in working on the questions. From this discussion the conclusion was the Jigsaw method has positive effect for the teaching-learning process.

## **Conclusion and Suggestion**

### **Conclusion**

After conducting the research and found the effect of the Jigsaw method on reading comprehension in non-major English basic science students at Bengkulu University especially on class 2A and 2B Nursing, the study concluded: First, there was significant improvement after taught using the Jigsaw method because the T value was 19.5 and the significance was 0.000, there was an increase that occurred after the treatment was carried out using the Jigsaw method. Second, there was no significant improvement with classes that were not taught using the Jigsaw method because the T value was -0.34 and the significance was 0.735, there was no increase after the treatment was not used using the Jigsaw method. Third, there was significant improvement between the controlled class and the experimental class. It can be seen that the post-test in the experimental class is much higher than the controlled class.

The thing that made teaching using the Jigsaw method could have significant improvement was because, the Jigsaw method means working in groups. In addition, students worked in groups not only in the original group, but there was an expert group that really helped students during the teaching and learning process.

### **Limitation of the Research**

After conducting the research, there are several things that are the limitations of this research. First, in planning the challenged faced in the experimental class, the groups should be divided equally between men and women, but considering that the average nursing class is female, so not all groups have male group members, considering that gender was one of the things important in group division. In the end, there were only a few male members.



Second, the challenged that are felt mostly in the process during treatment are carried out both in the experimental class and the controlled class. In the experimental class the challenge was, the class becomes less conducive because the class became quite noisy and less orderly considering the experimental class was discussing in two groups. Besides that, in the experimental class there were too many moving movements. First, all students have to study in the original group, then study in the expert group, and finally return to the original group. Movement between one group and another made the class less conducive because it causes commotion in the class. Whereas in the controlled class, the class was quite conducive because the class was able to pay good attention to the teacher and did the questions well without having to move seats, but the challenged in the controlled class was that there were still many students who did not want to ask about the difficulties when did assignments. It's unwillingness that made students unable to comprehend text properly. These two things were the limitations of the research.

### **Suggestions**

Based on the conclusion, some suggestions hopefully will be useful for teachers, students, and other study; 1. Teachers are able to apply the Jigsaw method to college level students. However, it should be noted that in using the Jigsaw method, the teacher is expected to use the Jigsaw method by making the class more conducive. 2. Students are able to be more active in discussions in expert groups. 3. For other study, this research can be developed using different subjects, other research can conduct research in social groups for college students. Moreover, this research focuses on reading comprehension, other researcher can use the same method but on other reading skills, such as reading ability, reading literacy, etc. The study also suggested that in the implementation of the controlled group treatment, if the experimental class has been carried out in groups, future research can deepen the research by giving treatment to the controlled class also using group learning.

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