The Effectiveness of Cooperative Learning-Jigsaw Model to Enhance Students' Speaking Ability: An Experimental Study at XI Grade of MAN 1 Mataram

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ABSTRACT

Keywords: Cooperative Learning, Jigsaw Model, Speaking Ability

Studying English is something that is mandatory in many countries including Indonesia since English is one of the most generally spoken languages in the world today. However, mastering English is not easy, especially for Speaking. This study focuses on seeing the effect of the Jigsaw on speaking ability since it reflects the performance of the students in order to provide provisions to face a real-world circumstance. This study aims to offer valuable insights for future researchers and teachers focusing on enhancing speaking skills or conducting research utilizing the Cooperative Learning-Jigsaw Model. This study used the Pre-experimental design, so the sample that was used was only one class. The use of Jigsaw influences students' involvement in speaking and increases their communication skills as indicated by significant differences in the pre-test and post-test scores tested using SPSS 23. In the result of the pre-test, only one student managed to reach "very good" category and no student was able to reach the "excellent" category. In contrast to the results of the post-test, there were 11 students who succeeded in achieving the "good" category, 9 students achieved the "very good" category and 1 student succeeded in achieving the "excellent" category which shows a significant improvement. Based on the results of hypothesis testing using the Paired T-Test, the Sig was known, namely $0.000 < \alpha$ (0.005), which means the Null Hypothesis was rejected and the Alternative Hypothesis (Ha) was accepted. Therefore, the Jigsaw model was effective in enhancing students' speaking ability.

Introduction

Studying English is something that is mandatory in many countries including Indonesia since English is one of the most generally spoken languages in the world today (Nurhairati et al., 2021). In this globalization era, everyone needs to be able to communicate in English orally and in writing to access all news and information in all aspects of life since the majority of news, books, and journals are published in English

and as a result, many people who do not speak English will have difficulty accessing information and fall behind (Adawiyah et al., 2023). Proficiency in English will facilitate effective communication across borders in various fields such as business, science, technology, and diplomacy. It provides access to a wealth of global resources, literature, and information, fostering international understanding, collaboration, and cultural exchange. Moreover, it enhances employability in a global job market and promotes inclusivity by enabling individuals to connect and interact with people from diverse linguistic backgrounds (Pangestika & Ratnaningsih, 2018). There are four skills that exist in English, namely Listening, Reading, Writing, and Speaking. Teaching English at school contexts both at junior and senior high schools in Indonesia requires students to master the receptive skills (listening and reading) and the productive skills (speaking and writing) (Nurhalizah et al., 2021).

This study focuses on the productive skill since it reflects the performance of the students. Performance is related to the ability to perform language well which is a benchmark of success in language or achievement of English learning outcomes. From the productive skills, speaking skill is chosen since the ability to speak is very important. According to (Febiyanti et al., 2020) speaking is the ability to talk fluently, which requires both knowledge of language features and the ability to process information quickly. For non-native speakers like in Indonesia, especially English learners, mastering speaking skill is difficult. The problem appears since the students have difficulty in arranging words into sentences, lack self-confidence and tend to memorize the text (Sari, 2017). This is an obstacle to enhance English language skills. With this difficulty, students are unable to convey their ideas and information so that students tend not to improve in speaking as happened at one of the schools in West Nusa Tenggara, namely MAN 1 Mataram.

Preliminary observation was conducted at MAN 1 Mataram, Nusa Tenggara Barat. According to the information delivered by one of the English Teachers, the students there mostly had a problem in their speaking ability especially at XI grade since the XI grade has the lowest speaking ability among the other two grades seen from the way of presenting a material and the discussion in the class. Also, the author made the second observation in order to ensure the teacher's information regarding the lack of speaking ability by observing the speaking activity in the class. The author saw that there was a problem in speaking ability especially at XI grade that was characterized by a lack of ability to make a sentence, tend to memorize the text and have low self-confidence. Therefore, the author decided to conduct a study which aims to focus on Students' speaking ability especially at XI grade students of MAN 1 Mataram.

There are basically many solutions to solve the speaking problem such as Content-Based Approach, Audience-Centric Approach, Cooperative Learning, and so forth. This study chooses Cooperative learning as a problem-solving since the author believes that in order to solve an issue related to a speaking ability, the approach which focuses and forces collaborative learning is needed. Cooperative Learning (CL) refers to a teaching method that allows students to work together on research projects (Namaziandost et al., 2020).

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Cooperative learning comes in various forms. According to Fauzati (Suwartono et al., 2020), Cooperative learning consist of Student Achievement Division (STAD), Jigsaw, Investigation Group, Structural Approach, Team Game Tournament, Team Accelerated Instruction (TAI), and Cooperative Integrated Author Reading and Composition (CIRC).

From the various forms of Cooperative Learning, the Jigsaw model is chosen to see its effectiveness in enhancing students' speaking ability. Aronson & Bridgeman (1979) defined the Jigsaw model as a cooperative learning strategy that enables each student in a "home group" to specialize in one aspect of a learning unit. Students then meet with other members from other groups who are assigned the same aspect, called "expert groups," to master the material. Afterward, students return to their "home group" and teach or explain the materials to their group members. This method is effective because each student's part is essential for the completion and full understanding of the final product, making the Jigsaw strategy a powerful tool for promoting collaboration and understanding among students. The students should push themselves to speak and to talk. Besides, by using a jigsaw learning strategy, the students can create their own ideas related to the topic of the material. Students have to discuss the topic with their classmates, and they have to deliver their idea by speaking. The advantages of the jigsaw learning strategy according to (Sukarta & Gunamantha, 2012) are exercising students to speak, discuss, and understand the material concept.

Moreover, the Jigsaw model is chosen since it has a concept of an expert and home group in which students are encouraged to be responsible in solving any specific task. As explained by Aronson & Bridgeman in the step of conducting Jigsaw model (1979), students will be the teacher of an expert group in order to discuss the material given. If the students are not able to explain in an expert group and only be a listener, they have to be responsible to explain the information in order to complete the separated task and try to get the maximum score. Here, the role of the teacher is very important in which the teacher should be a supervisor, provider and need to ensure that the students use English as the only language during the class. At the end of the activity, students are asked to present the things they get orally that make them used to explain the material without seeing the text. Hopefully, problems such as lack of self-confidence, lack of ability to make a sentence and tendency to memorize the text will be solved.

Based on the description above, this study is, thus, set at MAN 1 Mataram to investigate the effectiveness of cooperative learning using the Jigsaw model in enhancing the students' speaking ability for XI grade. And, this study chooses to conduct research entitled "The Effectiveness of Cooperative Learning-Jigsaw Model to Enhance Students' Speaking Ability: An Experimental Study at XI-grade of MAN 1 Mataram."

Research Methods

The study utilized a Pre-experimental design, which aims to compare the result of after and before the test. Specifically, this study used One-Group Pretest-Posttest design in Pre-experimental. This design involves measuring a single group's behavior before and

after treatment. Pre-experimental also was utilized since this study used the group that had already been formed and only sought the difference before and after the sample was given the treatment.

Table 1. The research design

Pre-test	Treatment	Post-test
Y1	*X*	*Y2*

There were two variables in this research, independent variable and dependent variable. The independent variable is the treatment of Cooperative Learning-Jigsaw Model. The dependent variable is Speaking Ability.

Y1	=	Pretest
Y2	=	Poesttes
X	=	The Implementation of Jigsaw Technique

Population and Sample

1. Population
   The population of this study was the XI-grade students of MAN 1 Mataram.
2. Samples
   The sample was 39 students from one class; XI MIPA 1 of MAN 1 Mataram.

Technique of Data Collection

In this study, one class was taken as a sample. The class was treated by using a Jigsaw model. Before the teaching activity, the pre-test was given to the sample. In this study, the material that was utilized was about unit 4; Environmental Awareness. In order to conduct the pre-test, a narrative text was provided consisting of 5 paragraphs and the students were given a time to prepare for an oral test. The author decided to make a text in Indonesian Language in order to measure their ability in constructing a sentence into English and assure that the students did not copy the same sentence from the text. The oral test was held for the achievement of 5 criteria in speaking such as pronunciation, grammatical range and accuracy, lexical resource and range, fluency and coherence & interaction (Brown & Abeywickrama, 2004). After the pre-test, the class was taught using the Jigsaw model as well as utilizing the material on the module to adjust the treatment and the material that should be learned.

After the teaching process, a post-test was given by using an oral test. It was a similar test to a pre-test. It aimed to find out whether or not the students' speaking ability was enhanced after applying the Jigsaw model. Finally, the result of the individual scores between pretest and posttest scores was administered as the data of research.

Technique of Data Analysis

To analyze the data, the author used statistical analysis as the method for data analysis following the data collection phase. Scoring classification involves the process of organizing student scores into predefined categories. In this particular investigation,

students' scores are categorized into several groups, including excellent, very good, good, satisfactorily, and poor based on the scoring rubric as follows:

Table 2. The classification of student scoring categorization from Brown & Abeywickrama (2010).

No	Category	Rating	Score
1	Excellent	5	81 – 100
2	Very Good	4	71 – 80
3	Good	3	56 – 70
4	Satisfactorily	2	41 – 55
5	Poor	1	0 – 40

Results and Discussion

The Result of Pre-test and Post-test

In this section, the result of the pre-test and post-test, gathered from the speaking measurement of class XI MIPA 1 student, were assessed and compared by applying a scoring rubric adapted from Brown & Abeywickrama (2010). Once these scores were calculated, they were subsequently categorized into several groups, including excellent, very good, good, satisfactorily, and poor. The result of students' speaking pre-test and post-test showed in the tabulation score as follows:

Table 3. The result of the students' pre-test and post-test score categories

No	Name	Scores		Categories	
		Pre-test	Post-test	Pre-test	Post-test
1	Student 1	32	48	Poor	Satisfactorily
2	Student 2	31	50	Poor	Satisfactorily
3	Student 3	57	56	Good	Good
4	Student 4	40	35	Poor	Poor
5	Student 5	69	80	Good	Very good
6	Student 6	60	71	Good	Very good
7	Student 7	40	42	Poor	Satisfactorily
8	Student 8	55	55	Satisfactorily	Satisfactorily
9	Student 9	60	75	Good	Very good
10	Student 10	65	69	Good	Good
11	Student 11	32	45	Poor	Satisfactorily
12	Student 12	55	53	Satisfactorily	Satisfactorily
13	Student 13	57	78	Good	Very good
14	Student 14	45	55	Satisfactorily	Satisfactorily
15	Student 15	45	69	Satisfactorily	Good
16	Student 16	65	78	Good	Very good
17	Student 17	40	65	Poor	Good
18	Student 18	45	50	Satisfactorily	Satisfactorily

No	Name	Scores		Categories	
		Pre-test	Post-test	Pre-test	Post-test
19	Student 19	60	68	Good	Good
20	Student 20	35	65	Poor	Good
21	Student 21	38	78	Poor	Very good
22	Student 22	38	43	Poor	Satisfactorily
23	Student 23	40	50	Poor	Satisfactorily
24	Student 24	55	51	Satisfactorily	Satisfactorily
25	Student 25	67	55	Good	Satisfactorily
26	Student 26	50	72	Satisfactorily	Very good
27	Student 27	75	88	Very good	Excellent
28	Student 28	30	41	Poor	Satisfactorily
29	Student 29	46	55	Satisfactorily	Satisfactorily
30	Student 30	52	67	Satisfactorily	Good
31	Student 31	52	58	Satisfactorily	Good
32	Student 32	52	73	Satisfactorily	Very good
33	Student 33	40	65	Poor	Good
34	Student 34	38	75	Poor	Very good
35	Student 35	20	34	Poor	Poor
36	Student 36	45	68	Satisfactorily	Good
37	Student 37	51	55	Satisfactorily	Satisfactorily
38	Student 38	33	48	Poor	Satisfactorily
39	Student 39	46	61	Satisfactorily	Good
	TOTAL	1866	2344		
	MAX	75	88		
	MIN	20	34		
	MEAN	47.84	60.10		
	STANDARD DEVIATION	12.32	13.39		

Table 4. The frequency and percentage of the students' pre-test and post-test score

		Pre-test			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-40	15	38.5	38.5	38.5
	41-55	14	35.9	35.9	74.4
	56-70	9	23.1	23.1	97.4
	71-80	1	2.6	2.6	100.0
	Total	39	100.0	100.0	
		Post-test			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-40	2	5.1	5.1	5.1
	41-55	16	41.0	41.0	46.2
	56-70	11	28.2	28.2	74.4
	71-80	9	23.1	23.1	97.4
	81-100	1	2.6	2.6	100.0
	Total	39	100.0	100.0	

Table 3 presents the result of pre-test and post-test along with the categorization. In the pre-test, the lowest score was 20, the highest score was 75 and the mean score of pre-test was 47.84. Also, there were 15 students that were categorized "poor". In contrast to the result of post-test in which the lowest score was 34, the highest score was 88, the mean score of post-test was 60.10 and only 2 students were categorized "poor", which means there was a significant difference between pre-test and post-test score result.

Moreover, based on table 4 above, there were only 9 students who succeeded in reaching the "good" category (namely 23.1% of the total sample) and only one student who succeeded in reaching the "very good" category (only 2.6% of the sample), which means there were only 25.7% from 100% sample succeeded to gain a good score. Also, in the pre-test, there was no student that was able to reach "excellent" categories. In contrast to the results of the post-test, there were 11 students who succeeded in achieving the "good" category, 9 students achieved the "very good" category and 1 student succeeded in achieving the "excellent" category which shows a significant improvement. In the result of the post-test, the majority of the sample succeeded in passing the good classification of the speaking ability, namely 53,9% from 100% of the sample.

The increase in the difference between the mean scores of the students on the pre-test and post-test indicates preliminary results suggesting that the use of the Jigsaw model in enhancing students' speaking ability was effective. However, it is important to note that these initial findings cannot be considered as conclusive results of the study. Therefore, the author must proceed to conduct further analysis to obtain more comprehensive and accurate results. To accomplish this, the author utilized a 2-tailed test using the SPSS program to see the effectiveness of the Jigsaw in enhancing students' speaking ability.

Normality Test

Prior to understanding the paired sample test, it is imperative to assess the data for normality. The purpose of the normality test is to ascertain whether the data derived from the students' pre-test and post-test results were normally distributed or not.

Table 5. Normality Testing
Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.097	39	.200[*]	.988	39	.945
Posttest	.110	39	.200[*]	.976	39	.544

According to the information provided in table 5, the significance value for all data in both the Kolmogorov-Smirnov and Shapiro-Wilk tests exceed a > 0,05 which means it can be inferred that the variance within the data were normally distributed.

Hypothesis Test

Based on the result of the data test by using Paired Sample T-test on SPSS Statistic 23 is as follows:

Table 6 Paired Sample T-test

		Paired Differences							Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	99% Confidence Interval of the Difference		t	df	
					Lower	Upper			
Pair 1	Pretest - Posttest	-12.25641	10.60218	1.69771	-16.85984	-7.65298	-7.219	38	.000

Where:

M: Mean

SD: Standard Deviation

SEM: Standard Error Mean

Sig: Significance

It can be seen from the output based on the table above, the result of statistics using the Paired t-test, the significance (sig) = 0.000, that can be inferred that the value is less than α (0.005). According to that value obtained, it can be concluded that the null hypothesis (H0) is rejected, which means the alternative hypothesis is accepted. It was a sign that the use of the Jigsaw model to enhance students' speaking ability was effective and there were significant differences in using the Jigsaw model in enhancing speaking ability.

Descriptive Statistic

The following is a descriptive statistical table of the experimental group pretest and post-test scores, which have been calculated using SPSS 23.

Table 7 Descriptive statistic pre-test and post-test

Descriptive Statistics of Pre-test

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Pretest	39	55.00	20.00	75.00	1866.00	47.8462	1.97438	12.32998	152.028
Valid N (listwise)	39								

Descriptive Statistics of Post-test

	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Posttest	39	54.00	34.00	88.00	2344.00	60.1026	2.14482	13.39441	179.410

Valid N (listwise)	39

In the table above, there are 10 columns. Column N statistics shows the amount of data processed; the statistical range is the difference between the data with the largest value and the data with the smallest value; the minimum statistical value is the lowest value of the entire data. The maximum statistic is the highest value of the entire data; the sum statistical value is obtained from the total score of the experimental group pre-test or post-test, and the mean shows the average pretest or post-test score of the experimental group students.

Standard Deviation Statistics is used to determine the data distribution in a sample and see how close the data is to the mean value. Variance statistics measures the variation or statistical dispersion of data; the variance value is obtained by dividing the results of the Sum of squares (Sum of squares) with data size (N).

Based on Table 7 above, the descriptive statistic of the pre-test, the total number of the group was 39 students (N= 39), range score = 55.00, minimum score = 20.00, and maximum score = 75.00. In addition, the total score or Sum = 1866.00, and the average score of student learning outcomes mean 47.8462 with Std. The error of mean = 1.97438. The total standard deviation is 12.32998, and the total data variance is 152.028.

For the descriptive statistics of the post-test shown in table 7, the total number of the group was 39 students (N= 39), range score = 54.00, minimum score = 34.00, and maximum score = 88.00. In addition, the total score or Sum = 2344.00, and the average score of student learning outcomes mean 60.1026 with Std. The error of mean = 2.14482. The total standard deviation is 13.39441, and the total data variance is 179.410.

Discussion

Several processes were carried out to maximize experimental research in improving the speaking skills of class XI MIPA 1 MAN 1 Mataram students, such as; a pre-test which aims to measure students' initial abilities, treatment which aims to apply the Jigsaw model in learning and finally a post-test, to see whether there are a changes that focus on the development of students' speaking abilities. In the treatment process, the students did the activity in accordance with the processes selected such as; selecting material, discussion with an expert group and home group, Q&A section and also discussion.

In treatment, there were 4 meetings held. At the first meeting, students were introduced to the Jigsaw learning model. The teacher divided students into small groups and each group member was given a different part of the material to study. When returning to their home groups, students were trained to share the information they had learned. At this stage, most students were still awkward and lacked confidence in speaking. They tend to read notes expressionlessly, with a limited vocabulary and often repeating the same words. Grammatical errors were also common, indicating that they still need time to adapt to the new learning format. Student engagement varied, with some

students actively speaking, while others were more passive. Teachers force the students to engage in learning activities by delivering a question and discussion.

By the second meeting, students were getting used to the Jigsaw format and getting more opportunities to interact. Teachers rotated groups to ensure variety in interactions between students. At this meeting, students' confidence in speaking increased. They started to talk more without relying too much on notes and showed initiative in expressing opinions and asking questions. There was increased engagement, with more students actively participating. Their use of vocabulary and sentence structure was also starting to improve, although there were still some grammatical errors.

The third meeting showed a more significant improvement in students' speaking abilities. Students become more adept at sharing information and working together in groups. They began to speak more fluently and use better intonation and facial expressions. Engagement was almost even across all students, and they seemed more enthusiastic in group discussions. Their vocabulary was more varied and grammatical errors began to decrease. Students also start providing constructive feedback to their peers, which helps correct mistakes collectively. At this stage, students were getting used to conveying their ideas about a topic without referring to the text.

By the fourth meeting, students showed clear progress in their speaking abilities. They appear more confident and able to speak. Even though there are still some students who have errors in grammar and pronunciation, they still try to develop their skills through discussion and collaboration activities. Discussions in groups become more dynamic, with students interacting and working together more. The vocabulary used is more diverse and structured compared to previous meetings. Grammatical errors became less frequent, and when they arose, students were able to correct themselves or get help from their peers. Students' involvement in speaking activities shows that the Jigsaw learning model was effective in improving their speaking abilities. This is in line with the previous statement from Aronson & Bridgeman (1979) in which students' speaking ability was enhanced because each student's part is essential for the completion and full understanding of the final product, they used to speak and ask about the material actively and intensively that made their progress developed.

Finally, this study used 2-tailed to measure the increase since the author did not yet know whether using Jigsaw is effective in enhancing speaking ability or not before the treatment. Analysis of the findings shows that the sig(significance) value was less than 0.005, concluding the effectiveness of using the Jigsaw model in enhancing speaking ability. The use of Jigsaw influences students' involvement in speaking and increases their communication skills as indicated by significant differences in pre-test and post-test scores seen from the mean and also the majority of the sample succeeded in reaching a good category. Therefore, it can be concluded that the use of the Jigsaw learning model can enhance students' speaking ability at XI MIPA 1 of MAN 1 Mataram especially when the students have problems such as lack of confidence and tend to memorize the text which makes them unable to speak and develop.

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Conclusion

In conducting this research, it is necessary to know the effectiveness of the Jigsaw model to enhance students' speaking ability in MAN 1 Mataram that can be utilized as a reference to solve the same issue especially related to speaking. This study's research design was the Pre-experimental. This research design aims to determine the effectiveness of the Jigsaw model in enhancing students' speaking ability that can be seen by analyzing data. Data were analyzed using SPSS Statistics 23.

Based on the research data, it was found that there was an increase after the students were given treatment. In the pre-test, there were only 9 students who succeeded in reaching the "good" category (namely 23.1% of the total sample) and only one student who succeeded in reaching the "very good" category (only 2.6% of the sample), which means there were only 25.7% from 100% sample succeeded to gain a good score. Also, in the pre-test, there was no student that was able to reach "excellent" categories. In contrast to the results of the post-test, there were 11 students who succeeded in achieving the "good" category, 9 students achieved the "very good" category and 1 student succeeded in achieving the "excellent" category which shows a significant improvement. In the result of the post-test, the majority of the sample succeeded in passing the good classification of the score, namely 53,9% from 100% of the sample. Based on the results of hypothesis testing using the Paired T-Test, the Sig is known, namely $0.000 < \alpha$ (0.005), which means the Null Hypothesis is rejected and the Alternative Hypothesis (Ha) is accepted. Therefore, the Jigsaw model is effective in enhancing students' speaking ability.

In conclusion, the study demonstrated the effectiveness of the Jigsaw model in enhancing students' speaking abilities at MAN 1 Mataram. Employing a pre-experimental research design and analyzing data using SPSS Statistics 23, the research found significant improvements in students' speaking performance after applying the Jigsaw model. Pre-test results showed that only 25.7% of students had achieved a "good" or higher score, with none reaching the "excellent" category. In contrast, post-test results revealed a substantial increase, with 53.9% of students attaining at least a "good" score, including notable gains in the "very good" and "excellent" categories. Hypothesis testing using the Paired T-Test further confirmed the model's effectiveness, with a Sig value of $0.000 < \alpha$ (0.005), leading to the rejection of the Null Hypothesis and acceptance of the Alternative Hypothesis. Consequently, the Jigsaw model proved to be an effective method for improving students' speaking skills.

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