Flipped Classroom Versus Traditional Classroom to Improve Students' Reading Comprehension Attainment During Covid-19 at SMA Negeri 7 Prabumulih

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Abstract. The writing is intended to know if a flipped classroom design improves reading comprehension scores among students in class XI of SMA Negeri 7 Prabumulih in the year 2022/2023. This study is quasi-experimental research. There are 216 students in population and 68 students in sample, they are XIA as controlled class and XIB as experimental class. The purposive sampling was applied. The collecting data used was reading comprehension test comprising 40 question items in the form of multiple choices. Before applying a parametric-test normality and Homogeneity test were applied. Then, t-test (test of sig.) was calculated with SPSS 26. A study conducted by this research found that students teaching using flipped classroom design models were more likely to have higher reading comprehension than students taught using traditional classrooms. The experimental class had a mean score (19.000) that was much higher than the average score (14.824) of the control class. It directly implies that the use of Flipped classroom design helps students achieve greater reading comprehension.

Keywords: Flipped Classroom · Traditional Classroom · Reading Comprehension

1 Introduction

The COVID-19 pandemic has caused governments to close schools and colleges in 213 countries. Many people have been compelled to transition from traditional to online schooling as a result of this predicament. Virtual-based learning or online learning was promoted in almost all nations as a way for teachers and school staff to remain in touch with pupils [1]. In Indonesia, this situation has resulted in the transformation of the conventional teaching approach into a technology-based model. It is a drastic adjustment that poses several difficulties for a teacher to adopt in the classroom.

Flipped classroom teaching is a type of teaching where students do both in-class activities and outside activities during class. In the online learning method, teachers use digital tools to give students help to learn how quickly they want to learn, and all

students are given assignments to learn independently at home and improve their learning capabilities. Students must actively study offline before they can join online classes. As part of the learning process, they must also be active in group work [2].

Many researches have looked at how to utilize the flipped paradigm to enhance reading comprehension, but few have looked at how critical thinking is used to support critical reading. Students can improve their English skills by using English more frequently in the flipped classroom. It will affect their academic success, learning styles, and engagement of English students have been examined by previous research (Hung, 2015). Some classrooms in high school have flipped classes, which means that students learn more about specific reading skills than they do in traditional classes. This can help improve their concentration on reading tasks. According to their findings, students given flipped directions may learn at their own speed and study outside of the classroom [3]. In a flipped classroom, the way the class is taught changes so that students can learn more about the content being taught. This allows them to understand the material in a deeper way. Surely, it also improves their achievement levels, thereby changing their roles as teachers and students. Studies have shown that flipped classrooms are highly effective and beneficial in a number of different ways [4]. Flipped classrooms have been found to boost students' achievement levels, making people want to learn different types of material [5, 6] inspiring students' desire to learn [7], enhancing the ability of students to grasp the learning materials [8], and increasing students' ability to write and their classroom engagement [9]. The influence how the flipped classroom affects different levels of reading comprehension skills of EFL learners was explored [10]. Investigating whether a flipped classroom design model is effective in teaching reading comprehension to students at SMA Negeri 7 Prabumulih is the focus in the writing. This model involves having students learn material in class, but then using resources, such as textbooks, and online to help them practice and improve their skills. This is being done in order to see if it has an effect on student reading achievement.

2 Literature Review

2.1 Defining Flipped Classroom

Engagement in learning is key to success in academics, so if a student is disengaged, their chances of doing well in school are lower. Students were able to show how engaged and interactive they were by engaging and interacting with others outside of the classroom. By engaging students in their regular school activities, teachers ensure they are meeting all behavioral, emotional, and cognitive markers while still meeting their learning goals. Positively engaged students obeyed class rules and norms well and demonstrated excellent behavior. Depending on their emotional state, students react positively and negatively to lecturers, peers, and academics. They may be engaged, interested, bored, happy, sad, or anxious. Meanwhile, achieve cognitive engagement can be achieved when they learn strategies and self-regulate to become more effective students [11]. A flipped classroom allows the lecturer to perform more activities, and students are no longer required to take notes during classes. Instead of lectures, students engage in activities and problem-solving during class time [12]. If students learn the material before class, they may be less interested in using it during the class session. In a traditional class, the

material is received during the session, so students are more likely to be engaged with it. Studies show, however, that interactive online videos are more effective than in-person lectures [13, 14]. Flipping classrooms will improve student performance by increasing student engagement [15].

Through flipped classrooms, online learning is a way of getting help from teachers in a way that is different from traditional classroom learning. In online learning, teachers provide video lectures that students can watch or use for individual help. This way, students can continue their learning even if they cannot come to class. In this way, it differs from traditional online learning. In traditional classrooms, teachers often give the same lecture to everyone, no matter how different their level of understanding may be. This can make the lectures go too quickly for some students, and too slowly for others. But sometimes, depending on what students say, teachers may change the speed of the lectures to make them more accessible to everyone. In flipped classrooms, video lectures provide students with the option to fast forward or pause to review topics which may require more processing time [16].

Flipped classrooms allow students to learn English grammar in a more active way, by watching instructional videos before class. This was investigated to see how well students perform, what they think of the process, and how they feel about learning English independently. There were 43 students who were grouped into two. The first group, the experimental group, learned by watching the videos by themselves before class and practicing what they had learned under the lecturer's supervision. The second group, the control group, received traditional method only in class. The final test proved that that students' grammar performance improved when learning in a flipped classroom, even though the results of the test were not significant. Students' responses to questionnaires and interviews showed that they had positive attitudes toward learning in a flipped classroom. The survey results and interviews with students reveal that they positively respond the use of flipped classrooms in their English classes [17]. In 2013, examined the effectiveness of flipped learning at California State University Northridge by using flipped classroom in two classes. In spring 2013, this study was carried out with 50 students. The course designed is especially helpful for students who want to learn more independently. Based on the statistical data, it seems that a majority of students found the course helpful.

Several students said that they learned more effectively using the flipped classroom method, and it looks as if the students benefited from it. The majority of students considered educational films to be useful, entertaining, and difficult enough [18].

2.2   Traditional Classroom

Traditionally, a classroom consists of a lectern placed under a microscope, surrounded by pale-colored walls and rows of tables and chairs. In the past, people have focused their education on attending classes every day, and school facilities were found to affect learning. Traditional classroom education is primarily based on teaching methods and focuses on learning materials rather than learning styles and differences between learners. Learning occurs naturally when learners harmonize their techniques along with their learning ability. In the traditional classroom, the senses and the mind are not stimulated. Instead, rote learning is encouraged [19].

2.3   Reading Comprehension

The understanding of a text that one acquires from reading is called comprehension in reading. Meaning is constructed as a result of reading instruction, and it is the main objective of instruction. A reader's comprehension of a text goes beyond simply understanding words, sentences, or sentences themselves, but also has need a prior knowledge integration, language proficiency, and metacognitive strategies. To understand what is written, the reader is demanded to bridge the gaps in the information by using what the reader has already known and by understanding what the author is trying to say [20].

Readers who understand what they are reading use a variety of strategies, including connecting what they know from their own lives, summarizing key points, drawing conclusions, and asking questions to help them make sense of what they are reading. Ultimately, the goal of reading instruction is to help students understand what they are reading [20].

3   Methodology

3.1   The Method of the Research

In this study, a method called statistical analysis was used to look at data. Statistical analysis is a way of looking at data that uses mathematical tools. This type of research was done using a type of experiment called quasi-experimental. This type of experiment is where participants are not randomly assigned to groups.

3.2   Research Place

The place where the research was conducted is important because it is related to the research's variable. The research was conducted at SMA N 7 Prabumulih in Jalan. Lingkar Timur, Muara Dua, Kecamatan Prabumulih Timur, Kota Prabumulih, Sumatera Selatan 31146. Time is also important in this research, and it was held from May to July 2022.

3.3   Research Variable

The study used a quasi-experimental design, which means that it used two different groups of people. The groups were different in terms of the independent variable (X) - one group was given a treatment, while the other group was not. The independent variable (X) is a change that is made to a classroom. One way to change the way a classroom is structured is to flip the design model. The outcome of this modification in the classroom is the dependent variable (Y). This result can be measured in different ways, such as reading comprehension achieved by the students.

3.4   Research Population and Sample

In this study, researchers looked at the eleven students in the class of 2022/2023 at SMA N 7 Prabumulih. They selected a sample that is representative of the entire population, so the generalization about this group of students is likely to be precise. To get a sample, the researcher chose two groups, XIA and XIB. There were 34 experimental students in group XIA and 34 control students in group XIB. This study used a non-equivalent or non-randomized control group design to see if a specific treatment would be affected. The research objective is to see if a specific treatment would be affected or not by the study.

3.5   Research Procedures

The way the teacher was using the flipped classroom was different from the way most classes are taught. Through three phases comprising before, during, and after class, the traditional classroom provides an excellent learning environment. The flipped classroom used three phases too: pre-reading activities (planning), during-reading activities (monitoring and evaluation), and post-reading activities (evaluating what was learned) (Table 1).

3.6   Technique of Data Collection

Researchers gathered data by conducting pre-tests, treatments, and post-tests. In more detail, the test was completed as follows:

1. Pre-Test
   Before starting the treatment, the researchers want to see if the students can understand what they read well. So, pre-test is done to see how well they do. Students are required to complete a pre-test as part of the testing procedure. There were 40 multiple-choice items. If the students answered the full question properly, they would receive 100 points.
2. Treatment
   The researchers tested two different classroom designs. One used a flipped classroom design model, and the other used a traditional teaching method. The study's findings revealed that the flipped classroom design model outperformed the traditional method in terms of improving student reading comprehension.
3. Post-Test
   The study's final task is a post-test that is administered after two classes that the researchers have instructed. The post-test involved 40 multiple-choice items, just like the pre-test. The effectiveness of the flipped classroom design model is then evaluated using test results. Researchers were able to evaluate how effective flipped classroom design model was compared to a non-flipped classroom design model class in this case.

Table 1. Summary of the instruction given in both classes

Experimental Classroom	Controlled Classroom
Pre-reading activity	Before Class
Lesson objectives and background knowledge are communicated by the lecturer. The lecturer introduces the topic and activates students' knowledge during the lecture. The lecturer uploads various teaching materials in various formats (such as videos and book chapters) so students can access them before class begins.	Students were not given any lesson materials before the class.
Monitoring and evaluating while reading	In Class
The lecturers review what they have taught in class, and then asks questions to help the students understand. They then assign homework, and the students discuss what they have learned in class. The lecturers then provide more information about the materials that the students need to know, and explain that these materials will be gradually added to the WA group.	Students received the lesson and the teacher gave the entire lecture.
Post reading activity	After Class
During this phase, students were guided to reflect on the teaching and learning process and draw conclusions about lessons learned. In order to assist students who experienced difficulty implementing the flipped classroom strategy, the lecturer asked them questions related to the material. Consequently, a lecturer could evaluate the learning process by using this activity. As a result, teachers would be able to reflect on their teaching. Reflective teaching is a way of learning and teaching that focuses on thinking about teaching in a critical way. This can help teachers improve their understanding of teaching, as well as the quality of their classroom practices. In case the first teaching and learning process did not improve student reading achievement, the researcher will take another look at the classroom using the flipped classroom method.	Students were given the homework and materials to be reviewed about that day's topic.

3.7   Data Analysis Technique

The quantitative data from the research was analyzed using statistics, which involved doing calculations to see how the data was related.

Two distinct tests were carried out by the researchers to identify if two groups of students had different outcomes after students had completed a course. The independent

sample t-test was used as the initial test to assess if there is any statistical proof that the associated population means differ significantly between two independent groups. The second test used was the pair sample t-test, which looked at differences in average scores between the two groups of students. A useful statistical test for examining differences between groups is the between-group t-test. It is especially helpful when one group's value for a certain parameter differs from the other group's value. When the two groups are not perfectly matched, a different kind of test called the paired-sample t-test can be applied.

a. Normality Testing
   Software called SPSS 26 is used to scrutinize whether the data was normal. The value of significance (α) was 0.05 indicating that there was a slight possibility that the data were not normal.

   1) H0: Data is normal if significance is less than 0.05.
   2) H1: Data is not normal if significance is greater than 0.05.

b. Testing for Homogeneity
   The researchers want to know whether or not the data has a consistent variance. To do this, the assumption of homogeneity of variance was adopted. Its purpose is to determine if two populations have the same distribution. If the variances are different, then the data might not be homogeneous.

   1) H0: Data are homogenous if significance is greater than 0.05.
   2) H1: Data are not homogeneous if significance is less than 0.05.

4   Results and Discussion

4.1   Results

In order to determine if the data from the pretest and post-test tests is normal, a normality test is conducted. Before choosing an analysis, determining the normality of the data is important. In this case, a normality test was used since the data was scrutinized through parametric statistics. The data is considered normal if the asymptote (2-tailed value) is bigger than or equivalent to 0.05. The results of the normality test of pre- and post-test data belong to the experimental class are displayed in Tables 2 and 3.

Typical score, according to data from the pretest, was 0.2226, and after the test, the average score was around 0.105. This suggests that the distribution of data is normal. This is significant because it means that the data are to be reliable.

Asymptotes either the pre-test or post-test is 0.181 and 0.100 separately. The asymptotes indicate that the data was distributed normally.

The homogeneity test establishes the homogeneity of the obtained data. The researchers conducted a test of variance homogeneity either on the post-test experimental or control classes using SPSS 26 by the sig. Level (α) = 0.05. The post-experiment homogeneity of variance results for the experimental and control classes are shown in Tables 4 and 5.

Table 2. Normalization test before and after the class tests on experimental class

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pre_test	.126	34	.191	.959	34	.226
post_test	.096	34	.200*	.948	34	.105

*This is a lower bound of the true significance.
[a]Lilliefors Significance Correction

Table 3. Normalization test before and after the class tests on control class

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig	Statistic	Df	Sig
.pre_test	.103	34	.200*	.956	34	.181
.post_test	.126	34	.191	.947	34	.100

*This is a lower bound of the true significance.
[a]Lilliefors Significance Correction

Table 4. The variance homogeneity test

		Levene Statistic	df1	df2	Sig.
Post Test Results	Based on Mean	2.668	1	66	.107
	Based on Median	2.788	1	66	.100
	Based on Median and with adjusted df	2.788	1	65.352	.100
	Based on trimmed mean	2.761	1	66	.101

H0 is accepted and H1 is rejected because Table 4's significance value is 0.107 indicating that is higher than 0.05. The data are homogeneous as a result.

To compare two student groups, t-test was adopted. The findings demonstrate that mean difference of 19,000 existed between the first group of students. Students on the second class had a mean difference of 15,543 between them. The mean difference between the two groups was determined to be the most significant difference between them, and the test's significance level was 0.000.

If the probability is high (above 0.05), student performance either before or after using a flipped classroom design model cannot be distinguished It is obvious that there is a significant difference between how students performed before as well as after using

Table 5. Experiment class paired sample t-test

Paired Samples Test				Pair 1
				Pre_test - Post_test
Paired Differences	"Mean"			-19.000
	"Std. Deviation"			9.909
	"Std. Error Mean"			1.699
	"95% Confidence Interval of the Difference"	"Lower"		-22.457
		"Upper"		-15.543
t				-11.181
df				33
Sig. (2-tailed)				.000

a flipped classroom design model if the probability is low (below 0.05). After the students completed pre- and post-tests, the researchers discovered that the flipped classroom design model significantly enhanced the students' reading comprehension classes. This demonstrates that the experimental group's students in the experimental class outperformed their reading comprehension scores compared to reading comprehension scores gained by students in the control group. Then, using the effect size, also known as eta-square, one can assess the distribution of significant effects between the experimental pre-test and post-test. Here, the difference between the pre-test and post-test scores for the experimental class is calculated.

$$\tilde{\omega}^2 = \frac{t^2}{t^2 + n - 1}$$

$$\tilde{\omega}^2 = \frac{t^2}{t^2 + n - 1}$$

$$\tilde{\omega}^2 = \frac{11.181^2}{11.181^2 + 34 - 1}$$

$$\tilde{\omega}^2 = \frac{125.014}{125.014 + 33}$$

$$\tilde{\omega}^2 = 0.791157$$

$$\text{Eta - squared} = \tilde{\omega}^2 \times 100\%$$

$$\text{Eta - squared} = 0.791157 \times 100\%$$

$$= 79.1157\%$$

Table 6. Paired sample t –test of controlled class

			Pair 1
			Pre_test - Post_test
Paired Differences	Mean		−14.824
	Std. Deviation		7.933
	Std. Error Mean		1.361
	95% Confidence Interval of the Difference	Lower	−17.592
		Upper	−12.055
t			−10.895
df			33
Sig. (2-tailed)			.000

The value of eta-square (0.791157) indicated a significant effect. This demonstrates the potency of the investigated variables. The degree of correlation between the variables was calculated using the Pearson correlation coefficient (r). The correlation between variables is divided into four categories. The correlation is very weak, as indicated by the score of 0.0r0.3. The score of 0.3r0.5 denotes a weak correlation. Moderate correlation is defined as a score of approximately 0.5r0.7. Scores of 0.7 to 0.9 and r > 0.9 are regarded as having strong and extremely strong correlation, respectively. The significant correlation remains significant even if the p-value is less than 0.05.

To ascertain whether there were any differences in the students' reading comprehension achievement between the groups before and after the application of traditional method, t-test was engaged. Table 6 contains the findings.

The t-test determined that there was a 14,824-point mean difference between the two groups. This implies that the groups differ in a statistically significant way. 17,592 and 12,055 are the lower and upper difference intervals, respectively.

The results of using traditional method on students' reading comprehension before and after they engaged in their reading activities are not significantly different if the probability of significance is greater than 0.05. The results of using traditional method before and after students engaged in their reading activities are significantly different if the probability of significance is less than 0.05. This implies that the reading comprehension of students is significantly impacted by the use of traditional method. The difference in the amount of change between the groups before and after the experiment was significant based on the following method.

$$\tilde{\omega}^2 = \frac{t^2}{t^2 + n - 1}$$

$$\tilde{\omega}^2 = \frac{10.895^2}{10.895^2 + 34 - 1}$$

$$\tilde{\omega}^2 = \frac{118.701}{118.701 + 33}$$

$$\tilde{\omega}^2 = 0.78246$$

$$\text{Eta - squared} = \tilde{\omega}^2 \times 100\%$$

$$\text{Eta - squared} = 0.78246 \times 100\%$$

$$= 78.246\%$$

The relationship between the variables is strong, as indicated by the high effect associated with the eta-square value (0.78246). This denotes that there is a good chance that the eta-square value will be meaningfully associated with the variables.

4.2 Discussion

This study sought to determine how well the flipped classroom design model could boost students' achievement in reading comprehension more than a traditional classroom. The outcomes demonstrated that, compared to the control group, the experimental class using the flipped classroom design model significantly increased students' reading comprehension scores. The statistics data, which showed that the mean score for the controlled class was 19.000 while it was 14.824 for the experimental class, served as evidence for this. This suggests that flipped classroom design is more effective than traditional classroom teaching of reading comprehension.

The standard deviation measures how much variation there is in a group of data. In this study, the standard deviation for the post-tests in the experimental and controlled groups was about the same (9.909 and 7.933, respectively). This means that the groups were pretty similar, which is what we would expect if the groups were randomly chosen.

By looking at the standard error, the level of variability in sample can be ascertained. The experimental group's standard error was 1.699, while the control group's was 1.361. This shows that the experimental group more accurately reflected the population than the control group.

According to the research, flipped classrooms are more effective at teaching students to read more effectively. In the flipped classroom, this is done so that students can learn by working on relevant projects [21].

As for this study, both student groups had similar outcomes from the same experiment. The purpose of this research was to see if using flipped classrooms to teach English grammar in secondary school has any impact on students' performance, how they feel about learning English independently, and what they think of the method. It was found that after they gave a final post-test to the students, their grammar performance improved [17].

In short, flipped classrooms may have helped students improve their reading comprehension skills [18].

5   Conclusion

Students can benefit from taking flipped classroom design, according to research. Based on the findings, it can be said that flipped classroom design can be used to teach reading comprehension and produce positive results because it actively involves students in their learning. After treatment, the advantages of using flipped classrooms were obvious. Here, it can be argued that learning through flipped classrooms can help students comprehend English reading. By using flipped classrooms, students can develop their independence and learn how and where to study even outside the classroom. Students must learn to evaluate their own knowledge and skills, plan their strategies, track their progress, and modify those strategies as necessary in order to become self-directed learners. Additionally, flipped lectures give students the chance to assess, use, and discuss previously learned material while putting component skills to the test. The executive guidance based on knowledge schema created through pre-learning prior to class may have contributed to the benefits that the students in this study saw from flipped classrooms. Future research can examine how the flipped classroom approach is applied at various educational levels.

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