

## **The Effectiveness of Flipped Classroom in Improving Students' Learning Outcomes**

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### **ABSTRACT**

An appropriate learning method is a basic way for learners to be able to achieve maximum grades and the achievement of existing learning objectives. The Flipped Classroom method is one of the new methods in Indonesia which can be one of the preferred methods that can be applied in teaching English. Surely, a trial is required to measure its effectiveness. The current study has two purposes, the first one was to determine whether the Flipped Classroom learning method was able to effectively improve student learning outcomes, especially in English lectures. Then, secondly, the purpose was how to apply Flipped Classroom in the classroom. This research is quantitative descriptive research with a quasi-experimental approach, employing a "Pretest – Posttest Non-Equivalent Control Group Design". The current study involved 2 groups, namely the experimental group, taught using Flipped Classroom learning and the control group taught using conventional learning (without flipped Classroom design). It was found that the value of sig. Levene's test is  $0.696 > 0.05$ , indicating that the data variance between the control class and the experimental class is homogeneous. Furthermore, the value of sig. (2-tailed) for the t-test, the value produces a value of  $0.000 < 0.05$ , then the decision-making in the t-test is to reject the  $H_0$  hypothesis and accept the  $H_a$  hypothesis. Thus, it can be interpreted that there is a significant difference between the average N-Gain scores of the control and experimental classes in English Engineering. It can be concluded that Flipped Classroom is effective in improving students' English skills in the topic of Describing Processes, as evidenced by the N-Gain value of 90, 91% which is included in the effective category. In other words, Flipped Classroom is effective to increase the students' scores in the class.

## INTRODUCTION

The Flipped Classroom learning method is not widely used in Indonesia for various reasons. However, according to previous studies, this method is very effective in building student learning abilities. This method is widely developed in other countries, especially developed countries. With various opinions, pros, and cons, researchers want to try to use this method to improve student learning outcomes, especially in learning English. A chemistry teacher at Woodland Park High School in Colorado, United States uses this method to help his students learn and the results are very satisfying (L & Pitra, 2019). These pros and cons are the basis for making this research. This Flipped Classroom learning method is discussed in several journals. Here are some of them:

It is stated that the innovative flipped classroom learning model has the potential to be applied in teaching and learning activities in universities. This learning can build a culture of independent learning and students' critical thinking. From that statement flipped classrooms can be one of the learning methods that can be chosen by teachers to promote independent learning and build up the student's critical thinking (Farida et al., 2019).

Meanwhile, it is also stated that Flipped Classroom is a digital solution where flipped learning offers alternative learning and can also be used to complement the shortcomings of traditional learning. The characteristic of conventional learning before has made the teacher becomes the source of the teaching. While this flipped classroom phenomenon has then turned the positions where the students become the source of the learning process, in some ways, it is proof that this method is effective for students (Purwitha, 2020).

The Journal of Equatorial Education and Learning stated that the Flipped classroom was able to increase the self-confidence of around 29.96% of its students. Confidence becomes the key to the students learning English. And Flipped Classroom as mentioned in this journal able to increase the student's confidence, they were not just learning but also a better characteristic such as promoting critical thinking (Pratiwi et al., 2017).

The following authors have also stated the same thing; it is said that the Flipped Classroom was able to improve student learning outcomes (Mubarok et al., 2019) in line with the opinions mentions in the same results in their research regarding the learning outcomes (Elya Umi Hanik & Dita Ramadhani, 2021). The increment of the learning outcomes through flipped classrooms is a sign of successful teaching methods.

Two problems will be studied in this research. These problems include:

- a. How is the use of the Flipped Classroom Learning Method in the learning process?
- b. Is the use of the Flipped Classroom Learning Method effective in improving student learning outcomes?

The flipped classroom is a teacher strategy by minimizing the number of direct instructions in the learning process. This strategy utilizes teaching materials that have been provided by the teacher which are given to students to be studied at home before taking part in classroom learning on the next material (Ogden, 2015). Meanwhile, it was stated that flipped classroom is a form of mixed learning in which students learn new material at home and what used to be homework is now

done in class with teacher guidance and interaction with students, instead of teaching. The results of student work are discussed and presented (Christopher et al., 2016).

Based on the description above, it can be concluded that the flipped classroom is turning the class from what was in the classroom to now behind at home. Students are given teaching materials first to be studied at home before entering class and activities in class are strengthening material that has not been understood and doing practice questions.

The following are the works on Flipped Classroom. Chi-Phu mentioned in the Journal of Frontier Psychology mention that Flipped Learning in language learning induces Learning Interest and more effectively enhances learning effectiveness and inspires creativity in changing passive learners into active learners. Which in this case means that Flipped Learning can increase interest in learning and at the same time it can increase the effectiveness of learning and provide creativity in students so that they can change passive learners into active learners (Chou et al., 2021).

In a journal, the Journal of International Review of Research in Open Distance Learning was conducted a study that aimed to analyze the trends and content of Flipped Classroom research based on 20 articles reporting on the use of Flipped Classroom from 2013-2015. just to find out the methodology used, the impact on the students given this method, and what challenges are faced in using this learning method. Based on the impact that occurs on students who have been taught this method, it can be concluded that Flipped Classroom has a positive impact on student learning activities which include achievement, motivation, involvement, and interaction. The challenge obtained in applying this method is the availability of quality learning videos (Zainuddin, 2019).

Meanwhile, a Ph.D. from Basken University made an article entitled "The Impact of the Flipped Classroom Model on Students Academic Achievement" which has the same research objectives as the research in the journals. However, the difference is in the results obtained. In this study, Emine used two classes. One experimental class uses the Flipped Classroom, and the other class is used as a control class which only uses the traditional Blended Learning method without using the Flipped Classroom. Both classes get a post-test pre-test. Then the results are compared. Statistically, it was found that there was no significant difference between the two classes. The only difference is that the class with the Flipped Classroom method comes to class more prepared and does not need to bring homework home (Cabı, 2018).

Muhammad Mujtaba conducted survey research on the effect of Flipped Classrooms on public schools in the Journal of Education Research International Journal, which focused on the dependence on the use of Flipped Classroom during a pandemic. The conclusion that can be drawn from this activity is that Flipped Classrooms can increase students' learning motivation (Mujtaba Asad et al., 2022).

A journal stated that Flipped Classroom can even be applied to students with low abilities. Existing videos as well as various other facilities can motivate students with low abilities to be motivated to learn. The method used in this research is a quantitative analysis using closed questionnaires to explore their perceptions and learning experiences using Flipped Classroom (Nouri, 2016). The conclusion is that the use of video in the flipped classroom helps to increase

knowledge and make learning more effective. Features in videos such as pause, rewind, and fast-forward videos are very useful in helping them learn.

Flipped Classroom learning model in online classes in collaboration with Bloom's taxonomy was also done to support the opinions of some researchers. The method used is almost the same as Jalal Nouri, namely using a questionnaire. Where 50% of the distributed questionnaires stated that Flipped Classroom is good when used in learning (A.A.G. Ekayana et al., 2021).

In Kwangsan Journal Vol 7 (2). Development of Flipped Classroom learning models with Bloom's taxonomy in the Indonesian Political System Course. From this research, it can be concluded that the innovative Flipped Classroom learning model has the potential to be applied in teaching and learning activities in universities, aiming to build a culture of independent learning and students' critical thinking (Farida et al., 2019). This study is also expected to be input for the Ministry of Research, Technology and Higher Education (Ristekdikti) or policymakers to recommend Flipped Classroom as a contemporary learning model in Indonesian higher education institutions.

In a journal entitled Flipped Classroom: school without homework, according to Mujiono, the homework that the students take home is still in the form of academic questions which sometimes they don't even have time to do. Arriving at home not a few students find it difficult to do the homework. With the Flipped Classroom, learning is done by turning what was traditionally done in class is now done at home which was traditionally done as homework is now completed in class (Mujiono, 2021).

It is said that in traditional learning educators deliver material, and then to increase understanding of the material, students will do assignments at school and are given homework. In Flipped Classroom, students participate in preparing for learning by watching videos, understanding power points, and accessing learning resources provided by educators. The conclusion from their research is that the digital revolution has an important influence in the digital revolution education field as in many other fields. This influence also causes radical changes in the field of education, such as in terms of teaching and learning approaches, so educators need to create forms of active learning that fit the characteristics of today's students (L & Pitra, 2019).

Design Research using 4D was carried out in a research step consisting of defining, designing, developing, and disseminating. The type of data used is primary data obtained directly from schools, expert teachers, and students. In this Educational Journal, these two authors carry the title Flipped Classroom Learning Model on Algorithm and Data Structure Courses. The results of this study indicate that the media developed are valid media with an average validity of 0.85% and material validity of 0.89% and practical with a practical value of 93.00% educator responses and 92.53 student responses. Based on this, it can be concluded that the learning model developed is valid, practical, and effective in increasing students' understanding which has implications for improving student learning outcomes (Farida et al., 2019).

## **METHODS**

This study aims to find out how is the use of Flipped Classroom in the class and whether these methods are effective in increasing the students' scores and achievement.

**Gap Analysis:**

Comparing the conventional methods of teaching (teacher-centred classrooms) and the Flipped Classrooms. Flipped Classrooms benefit both students and teachers. Benefits for students are greater development of independent learning skills, less affected by absenteeism, able to build a deeper understanding of topics.

This research refers to a quantitative research approach. Quantitative research is based on the philosophy of positivism which emphasizes objective phenomena that are studied quantitatively or carried out using numbers, statistical processing, structures, and controlled experiments (Sukhoiri et al., 2022).

The method used in this research is quasi-experimental. It explains that Quasi-experiments are almost similar to actual experiments. The difference lies in the use of subjects, namely in quasi-experimental assignments, random assignments are not carried out, but using existing groups. The research method used in this study is quasi-experimental. The quasi-experimental method is a research method that in its implementation does not use random assignments but uses existing groups.

The design used is a "Pretest – Posttest Non-Equivalent Control Group Design". The groups used in this study amounted to 2 groups, namely the experimental group using the Flipped Classroom method and the control group without the Flipped Classroom method. In this study, to determine the experimental class and control class, random assignment was carried out (Wiersma: 2010), namely the selection was carried out randomly to choose the class.

This study involved two variables, namely the experimental variable and the dependent variable. The experimental variable is the treatment for the experimental class and the treatment variable for the control class which is used as a comparison. While the dependent variable is the use of the Flipped Classroom Method.

The data collection technique in this study was in the form of a written test given to students before and after the treatment in both classes. Research is a process that has characteristics that are systematic, controlled, empirical, and based on theories and hypotheses (Sujianto: 2012). In general, there are two steps of activities that will be carried out in this research. The three steps include:

(1) In the first stage, determine the sampling of two classes, namely students who carry out English learning without the Flipped Classroom and the learning model that uses the Flipped Classroom. Pretest will be given at the beginning of the meeting before the implementation of the two models. After 16 meetings, a post-test will be conducted to measure the learning outcomes of the two groups. To support the quantitative data, the author will use an interview method that randomly selected as many as 5 students in each group to dig up information about the application of the learning.

(2) In the second stage, statistical analysis was carried out using a t-test, then recording/transcript of the results of interviews with students. All data obtained from the interviews will be transcribed so that it can be tabulated and processed.

(3) The third stage is to analyze and conclude the research results descriptively. At this stage, all data that has been obtained, transcribed, and tabulated will be analyzed to obtain a general conclusion regarding the impact of using the Flipped Classroom Method in learning English. Quantitative descriptive research designs are also considered more accurate in presenting data because they are considered capable of presenting data in more detail.

## RESULTS

This research was conducted using a quasi-experimental method with the form of the research design being a pretest – post-test control group design. The design of this research can be seen in Table 1 below.

| Group      | Pre-test       | Treatment | Post-test      |
|------------|----------------|-----------|----------------|
| Control    | T <sub>0</sub> | X         | T <sub>1</sub> |
| Experiment | T <sub>0</sub> | -         | T <sub>2</sub> |

Table 1: Research Design

Information:

- To = initial test score
- X = learning with conventional methods
- = learning with the Flipped Classroom method
- T<sub>1</sub> = final test score in the control class
- T<sub>2</sub> = final test score in the experimental class

Both classes were given the same initial test to determine the student's initial abilities. Furthermore, each class was given a different treatment, the control class received learning using the conventional method while the experimental class used the Flipped Classroom method. At the end of the lesson, both classes were given a final test in the form of questions.

The analysis used is descriptive quantitative to compare the ability of civil engineering students in the subject of Describing Process through the Flipped Classroom learning method. Samples were taken by purposive sampling method, namely each class 3A D3 Civil Engineering as a control class and class 3 B D3 Civil Engineering as an experimental class. The research instrument used was pretest and posttest which were given to two classes, namely the control class and the experimental class. The pretest and post-test scores for both classes can be seen in Tables 2 and 3.

| No. | <i>Pre-test</i> | <i>Post-test</i> | No. | <i>Pre-test</i> | <i>Post-test</i> |
|-----|-----------------|------------------|-----|-----------------|------------------|
| 1   | 70              | 80               | 13  | 77              | 87               |
| 2   | 72              | 82               | 14  | 78              | 88               |
| 3   | 80              | 90               | 15  | 84              | 94               |
| 4   | 75              | 85               | 16  | 82              | 92               |
| 5   | 72              | 82               | 17  | 79              | 89               |
| 6   | 75              | 85               | 18  | 70              | 80               |
| 7   | 74              | 84               | 19  | 74              | 84               |

|    |    |    |    |    |    |
|----|----|----|----|----|----|
| 8  | 76 | 86 | 20 | 73 | 83 |
| 9  | 80 | 90 | 21 | 72 | 82 |
| 10 | 80 | 90 | 22 | 75 | 85 |
| 11 | 82 | 92 | 23 | 80 | 90 |
| 12 | 76 | 86 | 24 | 83 | 93 |

Table 2: Pre-test dan Post-test class control score

| No. | <i>Pre-test</i> | <i>Post-test</i> | No. | <i>Pre-test</i> | <i>Post-test</i> |
|-----|-----------------|------------------|-----|-----------------|------------------|
| 1   | 75              | 95               | 13  | 78              | 93               |
| 2   | 78              | 98               | 14  | 80              | 95               |
| 3   | 80              | 95               | 15  | 78              | 93               |
| 4   | 77              | 97               | 16  | 84              | 98               |
| 5   | 75              | 90               | 17  | 82              | 97               |
| 6   | 80              | 95               | 18  | 70              | 95               |
| 7   | 78              | 93               | 19  | 75              | 90               |
| 8   | 78              | 93               | 20  | 78              | 93               |
| 9   | 85              | 98               | 21  | 80              | 95               |
| 10  | 80              | 95               | 22  | 80              | 95               |
| 11  | 85              | 98               | 23  | 78              | 93               |
| 12  | 75              | 95               | 24  | 80              | 96               |

Table 3: Pre-test and Post-test experiment class score

| No. | Control Class<br><i>N-Gain (%)</i> | No. | Experiment class<br><i>N-Gain (%)</i> |
|-----|------------------------------------|-----|---------------------------------------|
| 1   | 33,33                              | 1   | 80,00                                 |
| 2   | 35,71                              | 2   | 90,91                                 |
| 3   | 50,00                              | 3   | 75,00                                 |
| 4   | 40,00                              | 4   | 86,96                                 |
| 5   | 35,71                              | 5   | 60,00                                 |
| 6   | 40,00                              | 6   | 75,00                                 |
| 7   | 38,46                              | 7   | 68,18                                 |
| 8   | 41,67                              | 8   | 68,18                                 |
| 9   | 50,00                              | 9   | 86,67                                 |
| 10  | 50,00                              | 10  | 75,00                                 |
| 11  | 55,56                              | 11  | 86,67                                 |
| 12  | 41,67                              | 12  | 68,18                                 |
| 13  | 43,48                              | 13  | 75,00                                 |
| 14  | 45,45                              | 14  | 68,18                                 |
| 15  | 62,50                              | 15  | 87,50                                 |
| 16  | 55,56                              | 16  | 83,33                                 |
| 17  | 47,62                              | 17  | 83,33                                 |
| 18  | 33,33                              | 18  | 60,00                                 |
| 19  | 38,46                              | 19  | 68,18                                 |
| 20  | 37,04                              | 20  | 75,00                                 |

|             |       |             |       |
|-------------|-------|-------------|-------|
| 21          | 35,71 | 21          | 75,00 |
| 22          | 40,00 | 22          | 68,18 |
| 23          | 50,00 | 23          | 80,00 |
| 24          | 58,82 | 24          | 88,24 |
| <i>Mean</i> | 44,17 | <i>Mean</i> | 76,36 |
| Minimum     | 33,33 | Minimum     | 60,00 |
| Maximum     | 62,50 | Maximum     | 90,91 |

Table 4: Results of Calculation of N-Gain Percentage

The criteria for assessing the per cent N-Gain score can be seen in Table 5.

Category Interpretation of N-Gain Effectiveness

| Percentage (%) | Interpretation   |
|----------------|------------------|
| <40            | Ineffective      |
| 40-55          | Less Effective   |
| 56-75          | Enough Effective |
| >76            | Effective        |

Table 5: Categories of Interpretation of N-Gain Effectiveness

Based on the N-Gain calculation in Table 4, the average N-Gain value for the control class is 44.17% which is in the "less effective" category, with a minimum value of 33.33% and a maximum of 62.50%. Meanwhile, the experimental class got an N-Gain value of 90.91% which was categorized as "effective", with a minimum value of 60.00% and a maximum of 90.91%.

The difference test of 2 independent samples for the per cent N-Gain score of the two classes was carried out after the normality test of the data was generated. The results of the normality test using the Kolmogorov-Smirnov test can be seen in Table 6. According to the table, the normality test with the help of IBM SPSS 26 analysis shows that the value of Sig. of 0.166 and 0.115 which is greater than 0.05. The N-Gain per cent data normality test shows that the data is normally distributed.

| Tests of Data Normality |                  | Kolmogorov-Smirnov <sup>a</sup> |    |      | Shapiro-Wilk |    |      |
|-------------------------|------------------|---------------------------------|----|------|--------------|----|------|
| groups                  |                  | Statistic                       | df | Sig. | Statistic    | df | Sig. |
| N-Gain percentage       | Experiment class | .151                            | 24 | .166 | .933         | 24 | .113 |
|                         | Control class    | .160                            | 24 | .115 | .930         | 24 | .098 |

Table 6: Lilliefors Significance Correction

The next hypothesis test was carried out using an independent t-test by comparing the average N-Gain scores of the control and experimental classes. The formulation of this research hypothesis is as follows:

H<sub>0</sub>: There is no difference in the results of the N-Gain per cent English ability between the control group and the experiment group.

Ha: There is a difference in the results of the N-Gain per cent English ability between the control group and the experiment

The basis for making decisions on the t-test using SPSS v26 is, Ho is rejected if sig <0.05, and Ho is accepted if sig > 0.05. The results of the t-test can be seen in Table 7.

| Independent Samples Test |            |                             |   |      |                              |        |                        |                    |                          |   |
|--------------------------|------------|-----------------------------|---|------|------------------------------|--------|------------------------|--------------------|--------------------------|---|
|                          |            |                             | Levene's Test<br>for Equality<br>of Variances |      | t-test for Equality of Means |        |                        |                    |                          | 95%<br>Confidence<br>Interval of<br>the<br>Difference |
|                          |            |                             | F   | Sig. | t                            | df     | Sig.<br>(2-<br>tailed) | Mean<br>Difference | Std. Error<br>Difference | Lower   |
| N                        | Gain       | Equal                       | .155  | .696 | 12.851                       | 46     | .000                   | 32.192             | 2.505                    | 27.1497   |
|                          | percentage | variances<br>assumed        |   |      |                              |        |                        |                    |                          |   |
|                          |            | Equal                       |   |      | 12.851                       | 45.695 | .000                   | 32.192             | 2.505                    | 27.1488   |
|                          |            | variances<br>not<br>assumed |   |      |                              |        |                        |                    |                          |   |

Table 7: Independent Sample Test

According to Table 7 above, the value of sig. Levene's test is 0.696 > 0.05, indicating that the data variance between the control class and the experimental class is homogeneous. Furthermore, the value of sig. (2-tailed) for the t-test, the value produces a value of 0.000 < 0.05, then the decision-making in the t-test is to reject the Ho hypothesis and accept the Ha hypothesis.

Thus, it can be interpreted that there is a significant difference between the average N-Gain scores of the control and experimental classes in English Engineering. Thus, it can be concluded that Flipped Classroom is effective in improving students' English skills in the topic of Describing Processes, as evidenced by the N-Gain value of 90, 91% which is included in the effective category.

## DISCUSSION

This research was conducted using a quasi-experimental method with the form of the research design being a pretest – post-test control group design. Both classes were given the same initial test to determine the student's initial abilities. Furthermore, each class was given a different treatment, the control class received learning using the conventional method while the experimental class used the Flipped Classroom method. At the end of the lesson, both classes were given a final test in the form of questions.

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used was pretest and post-test which were given to two classes, namely the control class and the experimental class. Based on the N-Gain calculation in Table 4, the average N-Gain value for the control class is 44.17% which is in the "less effective" category, with a minimum value of 33.33% and a maximum of 62.50%. Meanwhile, the experimental class got an N-Gain value of 90.91% which was categorized as "effective", with a minimum value of 60.00% and a maximum of 90.91%.

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Thus, it can be interpreted that there is a significant difference between the average N-Gain scores of the control and experimental classes in English Engineering. Thus, it can be concluded that Flipped Classroom is effective in improving students' English skills in the topic of Describing Processes, as evidenced by the N-Gain value of 90, 91% which is included in the effective category.

## CONCLUSION

From the discussion above can be concluded that Flipped Classroom is effective in improving students' English skills in the topic of Describing Process, as evidenced by the N-Gain value of 90, 91% which is included in the effective category.

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