
Effectiveness of *Flipped Classroom* Model with Instagram in Junior High School

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ABSTRACT

KEYWORDS:

Flipped Classroom
Instagram
Science Learning

Science learning is still something that students avoid because it requires perseverance, seriousness, and many experiments. This problem can be overcome using interactive learning media and following the independent curriculum. However, learning media must align with technological developments in this digital era. Therefore, with the flipped classroom learning model, one uses Instagram social media as a science learning medium. This study aimed to determine the effectiveness of *flipped classroom* learning with Instagram media on ecology and biodiversity class VII material in one of the junior high schools in Klaten Regency. This quantitative experimental study uses the *N-Gain Score* test with a one-group pretest-posttest *design* to measure the improvement of cognitive learning outcomes before and after. The results showed that the application of *flipped classroom learning* assisted by Instagram media on ecology and biodiversity material on student learning outcomes was included in the practical category with an interpretation of the N-Gain value of 0.77.

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1. INTRODUCTION

Science learning is learning that prioritizes process skills. Science learning has a crucial role in the development of technology and science. However, science learning is still a subject that students avoid because it requires perseverance and much experimentation (Azzahra et al., 2022). One can overcome this by using interactive learning media that are per the application of the independent curriculum and can provide meaningful learning for students (Wahyu et al., 2020). An effort to improve education to meet the challenges of the times is the implementation of an independent curriculum. So that an implementation of this new curriculum must be welcomed with maximum readiness so as not to have a destructive impact that reduces the quality of education and learning (Taupik, 2022). The implementation of this independent curriculum was followed by the Industrial Revolution 4.0 towards Society 5.0, so that teachers are required to be more creative and innovative in learning. The creation of advanced technology that can expand the distribution of information is a characteristic of the Industrial Revolution Era 4.0 (Dwipayana et al., 2020).

In the digital era like today, learning media must align with technological developments. Learning media must be attractive to students and can be attached to them. Today, most children in the digital age like and enjoy using Instagram and other social media. So that Instagram can be used as an exciting and interactive science learning medium because its use is easy and various features are available (Mufidah & Mufidah, 2021). Various features on Instagram support the science learning process, including feed posts useful for sharing material before learning, Instagram TV, which is helpful for teachers in explaining the material, and Instagram Live, which

is useful for interaction with students about learning (Veygid et al., 2020). Because Instagram provides photo editing options that make it better and more pleasant, it can also encourage and boost creativity in its users (Dwi, 2012). The use of Instagram as a learning medium allows teaching and learning activities to be carried out outside the classroom. So that the learning model that can be applied is the flipped classroom.

According to (Octavia, 2020), A learning model is a plan or pattern that can be used to determine teaching patterns and learning tools. The learning model where students learn the material first at home before learning it in class is the "flipped classroom" model (Agustini, 2021). The flipped classroom is a learning model in general teaching, and learning activities carried out in the classroom will be carried out outside the classroom or at home. However, when in class, the activities carried out by students only discuss things that have been learned outside the classroom or at home (Damayanti & Utama, 2016). This "flipped classroom" learning model applies technology as a medium of learning. The application of technology in question is the use of video or other media as learning content for students to learn at home before doing face-to-face activities in class (Yulianti & Wulandari, 2021). The principle of using the media itself is effective and efficient, helps shorten the delivery time of teaching materials, and can stimulate the creativity of educators when getting new information through the media (Budiyono, 2020).

The "flipped classroom" learning model has advantages and disadvantages. The advantages of Flipped Classroom are: a) students can repeat the video until they understand the material; unlike in ordinary learning, if students do not understand, then the teacher must explain again until they can understand, so it is less efficient; b) students can access the video from anywhere as long as they have an internet connection; it can even be downloaded, and they are more satisfied to watch it repeatedly; and c) efficient, because students are asked to study the material at home and in class, they can focus more on their difficulties in understanding the material or their ability to solve problems related to the material (Damayanti & Utama, 2016).

The disadvantages of flipped classroom learning are: a) students do not ask for material that has not been understood when experiencing internet problems when accessing videos and learning materials at home; and b) teachers cannot ascertain whether students have learned videos and learning materials at home (Yildirim & Kiray, 2016). The weaknesses of this learning model can be overcome by maximizing the advantages of the flipped classroom learning model and Instagram media. Likewise, during face-to-face learning, teachers can review the material through Instagram media to determine whether students have understood it.

In research from Pratama (2021), it was stated that applying the Flipped Classroom learning model can improve the learning outcomes of grade VIII Junior High School students in the Bojonegoro area. The results showed that the N-Gain score of 75% means that it is in the high category. Strengthened by research from Sinatrya (2020), there are differences in student learning outcomes, which shows that the Flipped Classroom learning model using Instagram is effective. The study results obtained a pretest score of 63.31 and a posttest score of 96.37, meaning a significant increase. This study aimed to determine the learning outcomes of Flipped Classroom learning with Instagram media on class VII ecology and biodiversity material in one of the Junior High Schools of Klaten Regency.

2. METHODS

2.1. Types of Research

This study is a pre-experimental study using a one-group pretest-posttest design. Pre-experimental research is a form of experimental research design that manipulates independent variables to influence the formation of dependent variables. The research approach is quantitative because the data is in the form of numbers and is analyzed using statistics. The study consisted of two research variables: the flipped classroom learning model as an independent variable and student learning outcomes as a dependent variable.

2.2. Place And Time of Research

This research was conducted at SMP Negeri 1 Cawas in Klaten district, Central Java. The study was conducted from February to April 2023.

2.3. Population, Sample dan Sampling

The population in this study was all grade VII students of SMP Negeri 1 Cawas. The sample taken in this study was class VII SMP Negeri 1 Cawas, which amounted to 32 students using random sampling, namely simple random sampling.

2.4. Data Collection Techniques

2.4.1. Test

The test used in this study is a written test consisting of an initial test (pretest) before learning flipped classroom with Instagram and a final test (posttest) after learning flipped classroom with Instagram. The number of pretest and posttest questions is 20 with multiple-choice question types.

2.4.2. Observation

In this study, observation was carried out by observing the discussion activities of students during classroom learning. The instrument used in making observations is a checklist in the form of a Likert scale in the range of points 1-3.

2.5. Implementation Procedure

Before carrying out research, research instruments are made necessary for classroom learning. After that, a validity test is carried out to determine whether or not the research instrument to be used is valid. After the instrument is declared valid, research is carried out using an initial test (pretest) before the application of flipped classroom learning and a final test (posttest) after the provision of flipped classroom learning. During the flipped classroom, student activities were observed using observation sheets. The final stage is processing pretest and posttest data with the N-Gain Score test using SPSS 20, while student activity observation data is processed using descriptive statistical analysis. Only then is a conclusion made.

2.6. Data Analysis Techniques

2.6.1. Prerequisite Test

2.6.1.1. Normality Test

The normality test is used to determine whether or not the data taken is from a normally distributed population. The normality test using the Shapiro-Wilk test is calculated with SPSS 20.

2.6.1.2. Homogeneity Test

The homogeneity test is used to find out whether the sample groups used to come from the same varied population (homogeneous) or not. The homogeneity test is calculated with SPSS 20.

2.6.2. N-Gain Test

To calculate the results of the pretest and posttest using the formula according to (Hake, 1999)

$$N\text{-Gain} = \frac{\text{Skor Posttest} - \text{Skor Pretest}}{\text{Skor Maksimum} - \text{Skor Pretest}} \times 100\%$$

The categorization of the results of the N-Gain test corresponds to the following Table 1:

Table 1. Category of N-Gain Score Test

Percentage	Category
<40	Ineffective
40 – 55	Less Effective
56 – 75	Quite Effective
>76	Effective

2.6.3. Statistical Descriptive Analysis

To find out the value of the results of observing student activities by using the formula (Arikunto, 2019)

$$NA = \frac{\text{Jumlah skor yang diperoleh}}{\text{Jumlah skor maksimal}} \times 100\%$$

Categorizing the results of the final value calculation according to the following Table 2:

Table 2. Categories of Statistical Descriptive Values

Percentage	Category
86% - 100%	Excellent
76% - 85%	Good
66% - 75%	Enough
56% - 65%	Less
30% - 55%	Very Lacking

3. RESULTS AND DISCUSSION

3.1. Result

This research was conducted at SMP Negeri 1 Cawas using one experimental class, namely class VII, totaling 32 students in the even semester of the 2022–2023 school year. The study used pre-experiment research with a pretest-posttest group design to determine the effectiveness of the flipped classroom learning model using Instagram on student learning outcomes on ecology and biodiversity material in grade VII junior high school. The experimental class was given a treat, namely the application of the flipped classroom learning model in the science learning process

with the help of Instagram media. Cognitive data were obtained through pretests and posttests, while affective data were obtained through observation of student activity.

3.1.1. Normality Test

The normality test results using the Shapiro-Wilk test in the SPSS 20 program, with significant criteria if < 0.05 , then the data are not normally distributed. If > 0.05 , then the data are typically distributed, as can be seen in Table 3:

Table 3. Normality Test Results Data Using Shapiro-Wilk Test Learning Outcomes Cognitive Grade VII Junior High School in Klaten Regency

Statistic test	Student Learning Outcomes Test	
	Pretest	Posttest
<i>Sig.</i>	0.127	0.90
Uji Shapiro-Wilk	0.05	0.05
Kesimpulan	Normal	Normal

Based on Table 3 shows that pretest and posttest data are normally distributed. This corresponds to the normally distributed data significance criterion if the *Sig.* Value is more significant than 0.05. So it can be concluded that the pretest and posttest data from the learning outcomes in class VII in one of the Junior High Schools of Klaten Regency are normally distributed.

3.1.2. Homogeneity Test

The homogeneity test results were calculated using SPSS 20, with significant criteria if > 0.05 , then the variance in each homogeneous group can be seen in Table 4:

Table 4. Data on the Homogeneity Test Results of Class VII Cognitive Learning Outcomes Junior High School in Klaten Regency

Statistics	Student Learning Outcomes Test
<i>Sig.</i>	0.313
Homogeneity of Variance	0.05
Conclusion	Homogen

Based on Table 4 shows that the *Sig.* score on the student learning outcome test is more significant than 0.05. Following the test criteria, if the value of *Sig.* > 0.05 , then the sample has a homogeneous variance. Based on this explanation, it can be concluded that class VII in one of the Junior High Schools of Klaten Regency comes from a homogeneous population.

3.1.3. N-Gain Test

N-Gain test results were calculated after prerequisite tests (normality and homogeneity tests) using SPSS 20, with percentage criteria < 40 categorized as ineffective, $40 - 55$ categorized as less effective, $56 - 75$ categorized as quite effective, and > 76 categorized as effective. It can be seen in Table 5:

Table 5. N-Gain Score Test Results Data Class VII Cognitive Learning Outcomes Junior High School in Kabupaten Klaten

	<i>Pretest</i>	<i>Posttest</i>	N-Gain Score (%)
Lowest Rated	15	65	
Top Rated	80	100	77.46
Average	39.06	84.53	
Category			Effective

Based on Table 5 shows that the mean value is 77.46, which means > 76 . Therefore, it can be concluded that the average pretest and posttest data of grade VII students in one of the Junior High Schools of Klaten Regency.

3.1.4. Statistical Descriptive Analysis

The results of descriptive statistical analysis of the results of observations of student activities during learning, with average percentage criteria of 86% - 100% = excellent, 76% - 85% = good, 66% - 75% = sufficient, 56% - 65% = less, 30% - 55% = significantly less. It can be seen in Table 6:

Table 6. Data from Descriptive Analysis of Student Activity Observation Statistics During Class VII Junior High School Science Learning in Klaten Regency

Meeting	Percentage (%)	Average
I	85.6%	
II	92.4%	89.6%
III	90.7%	
Category		Very Good

Based on Table 6 shows that the average acquisition of descriptive statistical analysis is 89.6%, so effective learning outcomes are categorized as very good.

3.2. Discussion

This flipped classroom learning was carried out in one of the junior high schools in Klaten Regency. This study aims to determine the effectiveness of the flipped classroom learning model with Instagram media on student learning outcomes in science learning. To obtain data on student learning outcomes, tests are carried out: the initial test (pretest) before being given Flipped Classroom learning and the final test (posttest) after being given Flipped Classroom learning. Then the pretest and posttest results are compared to find out whether there is a difference before and after being given flipped classroom learning with Instagram.

Based on a descriptive analysis of student activity statistics during flipped classroom learning with Instagram, results were obtained that fall into the excellent category, namely 89.6%. Assessment of student activities during flipped classroom learning using Instagram by observing student behavior when discussing group learning in class and through Instagram media The results of the teacher's observations of student activities are written on observation sheets that the teacher has prepared before learning according to the rubric. The discussion activities carried out by students during group learning are excellent because students have learned the material and activities that will be carried out in class through Instagram media. So that students already know what will be discussed and what must be prepared for group learning in class.

The following is a data display from the results of a descriptive analysis of student activity statistics during flipped classroom learning with Instagram:

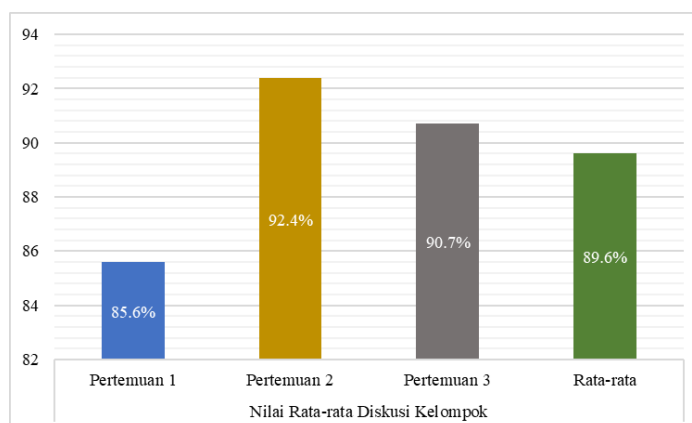


Figure 1. Chart of Descriptive Analysis Results of Student Activity Statistics During Learning Flipped Classroom with Instagram at one of the junior high schools in Klaten Regency

The lowest result was at the first meeting, and the highest was at the second. At the time of the first meeting, students were still adapting to learning the flipped classroom model using Instagram. Instagram is currently a social media platform in great demand among teenagers. Although Instagram is familiar to junior high school students, its use is less than a learning medium. And also, the flipped classroom learning model has never been applied to science learning in this school, so students still feel the concept of flipped classroom learning with Instagram. However, the second and third meetings showed high results, meaning that students already understand and feel suitable for applying Flipped Classroom with Instagram to science learning.

Before conducting the N-Gain test, prerequisite tests were carried out, namely the normality and homogeneity tests. The results of the normality test with the Shapiro-Wilk test using SPSS 20 showed that pretest and posttest data from grade VII learning outcomes in one of the junior high schools in Klaten district had a significance of > 0.05 , namely 0.127 for the pretest and 0.90 for the posttest. From these results, it can be concluded that the data is normally distributed. Then a homogeneity test showed that the sig. value on the student learning outcomes test (pretest and posttest) was more significant than 0.05, which is 0.313, so it can be concluded that class VII comes from a homogeneous population. Based on the results of the normality test, which shows normally distributed data, and the homogeneity test, which shows a homogeneous class, it can proceed to the N-Gain test to calculate the effectiveness of the treatment given.

The results of the N-Gain test showed the average percentage of effective cognitive learning outcomes, which was 77.46%. These results indicate that flipped classroom learning using Instagram in grade VII junior high school science learning is effective. It is said to be effective because the average percentage of cognitive learning outcomes obtained is > 76 , which means there is a significant difference between the pretest and posttest results. From the results of the N-Gain test, which states that it is effective, the application of flipped classroom learning using Instagram in science learning can be accepted and followed well by students. Flipped classroom learning encourages students to be more active and creative with group learning. So learning is not boring because it is not only teacher-centered, and learning in the classroom is more efficient because the material has been delivered through Instagram. The use of Instagram media is also

very interesting for students because the display of material is more interesting, and learning resources are also getting more comprehensive and can be easily accessed.

The application of learning media using social media, namely Instagram, certainly influences students. There are two types of influences: good influence and bad influence. The destructive effects of using Instagram include reducing student learning time because there is a lot of information that students can access when using Instagram. Students become less socialized with the surrounding environment if they are not controlled by the application. Positive influences from the use of online applications and media include socializing (Hasiholan et al., 2020). Second, sharing knowledge with the Instagram application can indirectly provide convenience and effectiveness for students to share knowledge. Third, by updating themselves through the Instagram application, students can easily find new things or knowledge, like what happens and when. Fourth, learning from various sources: advances in communication technology in the current era make it easy for individuals to obtain lessons from various sources (Madhani et al., 2021).

Based on the results of the research that has been done, the influence of using Instagram as a learning medium is positive. Students become more active in group discussion activities and can work well together. Similarly, students' cognitive learning outcomes show that Instagram media can help students with problems with improving grades. Using Instagram in learning, students can explore knowledge widely from various sources they need. Students can also interact with other friends on Instagram to exchange information and knowledge. In this way, teachers teach students to be more able to use social media for positive things, one of which is to learn.

The flipped classroom learning model emphasizes not just learning to use images and videos displayed through Instagram media but also utilizing time in class to make learning more meaningful (Yulietri & Mulyoto, 2015). By studying the material at home first, time in class can be maximized for experimental activities, which are often rushed and not optimal when implemented due to time constraints. In addition, flipped classroom learning creates good communication between teachers and students (Sumarni et al., 2020). The flipped classroom learning model is very efficient in science learning, so students can accept it because it does not take too much time to listen to material in class. Especially when group learning and experiments will be carried out, this learning model is beneficial for shortening time.

Every time you do an activity, you will undoubtedly encounter an obstacle, both small and large. The application of the flipped classroom learning model with Instagram in science learning in grade VII junior high school also encounters obstacles. When learning through Instagram, two students still do not have personal cell phones, so they still use their parents' cell phones. This causes students to sometimes need to catch up when accessing information submitted through Instagram. However, this obstacle can be overcome by reminding students to turn on notifications on Instagram accounts to be included. During science learning, students are still expected to have adequate internet access. In addition, the teacher reviews the material delivered via Instagram when in the classroom. The teacher also asked students to summarize the material on Instagram before class lessons.

Research from Pratama (2021) concluded that the application of the flipped classroom learning model could improve the learning outcomes of grade VIII junior high school students in the Bojonegoro area with an N-Gain score of 75%, which means it is in the high category. Research from Sinatrya (2020) concluded that there are differences in student learning outcomes, which shows that the flipped classroom learning model using Instagram is effective. The study results obtained a pretest score of 63.31 and a posttest score of 96.37, meaning a significant increase. Both

studies are in line with the results of this study, which concludes that the application of flipped classroom learning using Instagram is effective.

4. CONCLUSIONS

Based on the data analysis and discussion above, it can be concluded that the flipped classroom learning model using Instagram in science learning materials in one of the junior high schools in Klaten Regency is included in the effective category.

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