Islamic Journal of Integrated Science Education (IJISE), Vol. 1 No. 3, November 2022, pp. 152-160
DOI: https://doi.org/10.30762/ijise.v1i3.358

Islamic Journal of Integrated Science Education (IJISE)

Program Studi Tadris IPA
Institut Agama Islam Negeri Kediri
e-ISSN : 2986-0865
https://jurnalfaktarbiyah.iainkediri.ac.id/index.php/ijise

Improving Student Learning Outcomes Using the Flipped Classroom Learning Model

Nova Khairani[1*], Indayana Febriani Tanjung[2], Rohani[3]
[1]Universitas Islam Negeri Sumatera Utara, Indonesia
[2]Universitas Islam Negeri Sumatera Utara, Indonesia
[3]Universitas Islam Negeri Sumatera Utara, Indonesia

***Correspondence: E-mail:** novakhairani211998@gmail.com

Abstract: This study aims to determine the effect of the Flipped Classroom learning model on student learning outcomes on Environmental Pollution material in Al-Hijrah Integrated Islamic Junior High School Medan. This research is a quantitative research (quasi-experimental). The population in this study were all class VII IT Al-Hijrah Junior High School Medan, totaling 94 students. The sample taken in this study was random sampling consisting of two classes, namely class VII-AB Ikhwan as an experimental class and class VII-B Ikhwan as a control class with 16 students in each class. Based on the results of data analysis, the average pretest value of the experimental class was 40.42 including the low category, the posttest average value of 81.0 including the high category. While the average pretest for the control class is 40.00, including the low category and the average score for the posttest for the control class is 61.67, including the low category. The results of hypothesis testing tarithmetic = 5.35 > ttable = 2.04 with probability = 0.05 and dk = 30. With the conclusion that the hypothesis H0 rejected and the hypothesis Ha is accepted, because tcount > ttable = 5.35 > 2.04. This shows that there is an effect of using the flipped classroom learning model on student learning outcomes.

Keywords: flipped classroom, learning model, learning outcomes

Article History:
Received: 21 July 2022; Revised: 19 August 2022; Accepted: 10 September 2022; Published: 30 November 2022

Citation (APA Style):
Khairani, N., Tanjung, I. F., & Rohani. (2022). Improving Student Learning Outcomes Using the Flipped Classroom Learning Model. *Islamic Journal of Integrated Science Education (IJISE), 1*(3), 152–160. https://doi.org/10.30762/ijise.v1i3.358

INTRODUCTION

We are currently entering an increasingly advanced era, marked by rapid changes in various areas of life, especially the use of various artificial intelligences. This era by Professor Klaus Schwab is called the Industrial Revolution 4.0. In the era of Industrial Revolution 4.0, complex competencies and abilities must be possessed by someone to be able to compete with others. Therefore, efforts that can be made to overcome the era of RI 4.0 or the 21st century are reforms in learning (Syarifuddin, 2018).

According to the theory of cognitivism, learning occurs by activating students' senses in order to gain understanding. In activating it, a teacher must be able to change the learning process from teacher centered to student centered. So that it can develop the potential possessed by students (Dangnga & Muis, 2015).

But in fact, based on the results of observations and interviews with science subject teachers at the Al-Hijrah Integrated Islamic Junior High School in Medan, in the learning process in the classroom the teacher still uses the lecture method, giving assignments, and asking questions. So that students are less active in learning and students only receive information from the teacher without further analyzing. And when the teacher gives problems and work, students answer less varied. This causes a lack of students' ability to solve problems, analyze problems and express opinions when answering problems given by the teacher during the learning process, so that the value of student learning outcomes is still below the average of 68 compared to their Minimum Completeness Criteria of 80.

Based on these problems, researcher tried to use the flipped classroom learning model, with the aim of making students more active in the learning process and students being able to understand the material being studied.

Flipped classroom learning model is a model that focuses on student learning (student centered), and a learning model that utilizes the development of information and technology (Ozdamli & Asiksoy, 2016; Tatarchuk & Eick, 2012). This learning model is an inverted learning model, where the process of providing material can be seen by students through learning videos, and powerpoints given by teachers (Baytiyeh, 2017; Evseeva & Solozhenko, 2015). In addition, students can also see other learning resources that can support learning materials such as on YouTube, Khan Academy, and others at home, while the learning process in the classroom is the process of solving problems and questions (Chilingaryan & Zvereva, 2017; Hwang et al., 2015).

The application of the flipped classroom learning model in class VIII of Junior High School 5 Ponorogo in the 2017/2018 academic year (Yunita & Windi, 2018). Thus, researchers are interested in conducting research on " Improving Student Learning Outcomes Using the Flipped Cassroom Learning Model". With the aim of knowing the effect of the Flipped Classroom learning model on student learning outcomes on Environmental Pollution material in class VII Al-Hijrah Integrated Islamic Junior High School Medan, Indonesia.

METHOD

This research is a quantitative research with a random sampling technique (simple random sampling) (Arifin, 2017). The samples taken in this study were 2 classes, namely class VII-B Ikhwan which consisted of 16 people as a control class using conventional learning models and class VII-AB Ikhwan which consisted of 16 people showed that the flipped classroom learning model could increase student activity, namely in cycle 1 obtained an average of 55% (less active) while in cycle 2 it was 81% (active), and student learning outcomes increased from 52% in cycle 1 to 79% in cycle 2. Based on this, there was a positive relationship between the quality of portfolio reports and quiz scores.

As an experimental class using the *flipped classroom learning model.* In the process of collecting data, researchers used tests, namely *pretest* and *posttest.* With the research design as in **Table 1** (Sugiyono, 2012).

Table 1. Research design

Group	Pretest	Treatment	Posttest
Experimental	O_1	X	XO_2
Control	O_2	CO	CO_2

Description:
X = Class using the *flipped classroom*
C = Class using the conventional model
O1 = *Pretest* at the beginning of the experimental class
O2 = *Pretest* at the beginning of the control class
XO_2 = *Posttest* at the end of the experimental class
CO_2 = *Posttest* at the end of the control class

Before the pretest and posttest were carried out, the validity of the questions was first tested on the environmental pollution material. The validity test was carried out on material experts, namely biology education lecturers and tested on students who have studied environmental pollution material (grade VIII). There were 60 validated questions and only 31

valid questions, which were calculated using the flipped classroom learning model and 16 students of class VII-B Ikhwan as the control class using the conventional learning model.

FINDING AND DISCUSSION

Finding

The research that I did in class VII Al-Hijrah Integrated Islamic Junior High School in Medan was a quantitative study, namely to determine the effect of the flipped classroom learning model on student learning outcomes on Environmental Pollution material in class VII Al-Hijrah Integrated Islamic Junior High School in Medan. Collecting data in this study using learning outcomes tests, namely in the form of pretest and posttest. Data were obtained from 32 students consisting of 16 students of VII-AB Ikhwan as an experimental class using the flipped classroom learning model and 16 students of class VII-B Ikhwan as a control class using a conventional learning model, and the data obtained from learning outcomes are as in **Table 2**.

Table 2. Descriptive statistics

Group	Min	Max	Mean	Deviation	Variance
O_1	30	53	40.4	7.08	50.2
XO_2	70	93	81.0	7.27	52.9
CO_2	30	50	40.0	6.99	48.9

Based on **Table 2**, it is obtained that the experimental group's pretest data in class VII AB Ikhwan has an average of 40.42 and is included in the low category and control class VII-B Ikhwan with an average of 40.00 is included in the low category. The average value of learning outcomes after learning (posttest) in the experimental class is 81.00 which is included in the high category and the control class with an average of 61.67 is included in the low learning outcome category. In the posttest learning outcomes the standard deviation of the experimental class is lower than the standard deviation of the control class, as well as the variance of the control class is higher than the control class. Based on the descriptive data above, it can be made a histogram of the comparison of the average scores before (pretest) and after learning (posttest) student learning outcomes in the experimental class and the control class, as in **Figure 1**.

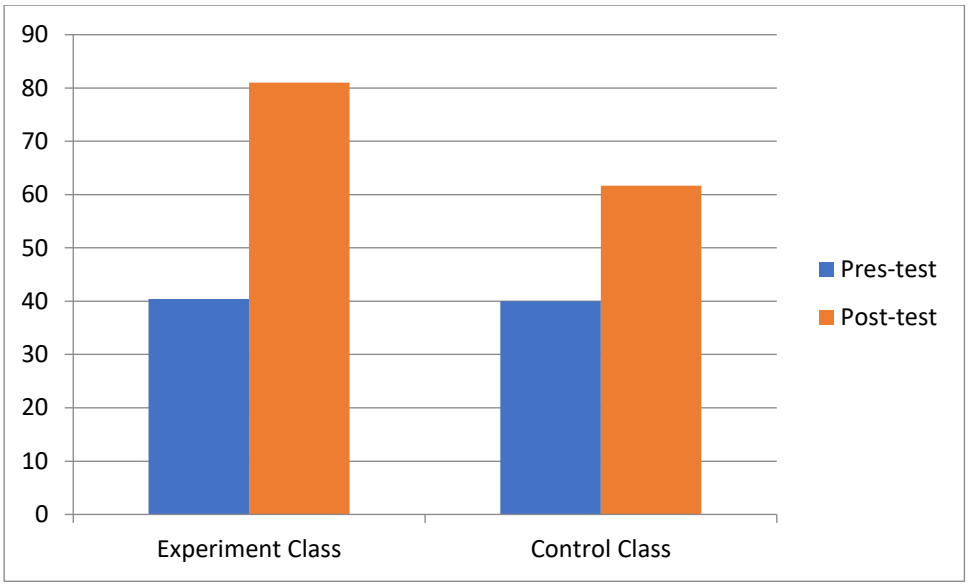

Figure 1. Histogram of the comparison of the average pretest and posttest scores for the experimental class and the control class

Normality Test

Normality test aims to see the sample taken represents the population distribution. If the sample distribution is normal, it can be said that the sample taken represents the population, because good data is data that resembles a normal distribution. The principle of the normal distribution test to compare the distribution of the data obtained (observed) and the distribution of the normal data (expected) (Gunawan, 2017). Normality test result of experiment class and control class shown ini **Table 3** and **Table 2**.

Table 3. Normality test result of experiment class

Type	**Normality**		**Criteria**
	D_{max}	**$D_{critical}$**	
Pretest	0.123	0,327	$D_{max} < D_{critical}$= Normal
Posttest	0,116	0,327	$D_{max} < D_{critical}$= Normal

Table 4. Normality test result of control class

Type of Test	**Normality**		**Criteria**
	D_{max}	**$D_{critical}$**	
Pretest	0.154	0.327	$D_{max} < D_{critical}$= Normal
Posttest	0.091	0.327	$D_{max} < D_{critical}$= Normal

Homogeneity Test

Test The homogeneity test is a test to find out that the research data from each group comes from a population with the same diversity. In this homogeneity test using Microsoft Excel, with the F test formula (Hanief & Hirmawanto, 2017) namely, F = largest

variance/smallest variance. With the data obtained: (a) The value of the experimental class variance = 52.92; and (b) The value of the variance of the control class is 80.00.

Thus, the value of the F_{count} test = 1.51 while for F_{table} = 2.40 with degrees of freedom (dk) = 15 and a significant level of 0.05. Thus, it is known that $F_{count} < F_{table} = 1.51 < 2.40$, so it can be concluded that the two data groups are homogeneous.

Hypothesis Testing

One technique that can be used in the hypothesis test is the t-test (student test) (Simanjuntak & Dameria., 2020) using Microsoft Excel 2016 and can be seen in the following **Table 5**.

Table 5. Hypothesis testing (T-Test)

Class	**Experiment**	**Control**
Mean	81	62
Standard Deviation	7.27	8.94
Variance	52.92	80.00
Dk	30	39
Correlation coefficient	0.13	
$t_{arithmetic}$	5.35	
t_{table}	2 .04	

Based on **Table 5** to see the effect of the flipped classroom learning model on student learning outcomes on environmental pollution material in class VII Al-Hijrah Integrated Islamic Junior High School in Medan, the value of $T_{count} = 5.35 > T_{table} = 2.04$ with probability = 0.05 and dk = 30. So it is known that the hypothesis H_0 is rejected and the hypothesis H_a is accepted, because $T_{count} > T_{table} = 5.35 > 2.04$ or $T_{table} < T_{count} = 2.04 < 5.35$. Thus the flipped classroom learning model affects the learning outcomes of class VII students at Al-Hijrah Integrated Islamic Junior High School in Medan, Indonesia.

Discussion

The results of research data analysis regarding The Influence of the Flipped Classroom Learning Model on Student Learning Outcomes at Al-Hirah Integrated Islamic Junior High School in Medan in the VII-AB Ikhwan experimental class showed the average value before the learning process using the flipped classroom learning model, pretest scores were 40.42, and included in the category of low learning outcomes. After students learn by using the flipped classroom learning model, the average posttest score has increased to 81.00 and is included in the high category. Meanwhile, in the control class VII-B Ikhwan the students' pretest scores were 40.00, included in the low category and the students' posttest scores were 61.67 and still in the low category.

So that in testing the hypothesis between the experimental class and the control class, it is obtained $T_{count} > T_{table} = 5.35 > 2.04$, then H_0 is rejected and H_a is accepted. This means that there is an effect of the Flipped Classroom Learning Model on student learning outcomes on Environmental Pollution material in class VII Al-Hijrah Integrated Islamic Junior High School in Medan. The influence of student learning outcomes using the flipped classroom learning model is due to the syntax in the implementation of this learning process which requires students to study at home by watching learning videos provided by the teacher or accessed by students. So that students can organize their own understanding of the learning material they watch.

In addition, students are also more motivated in participating in learning because the flipped classroom learning model can attract students' interest in learning, where teachers usually use lecture and assignment methods. But using this model forces students to activate all their senses and makes students play an active role in the learning process. So that the learning process becomes more collaborative and students become focused on the practical application of knowledge during class. The regular and structured use of technology in this learning process is the difference between an inverted class and an ordinary class. Thus, the learning process using the flipped classroom learning model can improve student learning outcomes.

This is in accordance with research conducted by Nyeneng et al. (2018) and Ogden (2015) which concluded that using the flipped classroom learning model can make students more prepared intellectually and emotionally because they have an idea of what to do in classroom learning. This is also in accordance with research conducted by Tanjung (2019) and Zainuddin & Halili (2022) concluding that if the learning process is carried out properly and appropriately, the value obtained will be good, whereas if the learning process is not good, the learning outcomes are not good either. Thus the flipped classroom learning model can be used by teachers as a reference in the learning process so that students become more active and better understand the learning material (Akçayır & Akçayır, 2018; Espada et al., 2020).

CONCLUSION

Based on the results of data analysis on student learning outcomes, it can be concluded that there is an effect of the Flipped Classroom Learning Model on student learning outcomes on Environmental Pollution material in class VII Al-Hijrah Integrated Islamic Junior High School in Medan with the acquisition of $T_{count} = 5.35 > T_{table} = 2.04$ with probability = 0.05

and dk = 30. So it is known that the hypothesis H_0 is rejected and the hypothesis H_a is accepted, because $T_{count} > T_{table} = 5.35 > 2.04$. With the statement above, the research conducted can answer the problem formulation that has been determined previously.

Based on the results of these studies, biology teachers should be able to use the flipped classroom learning model as an alternative in the learning process. For students, the flipped classroom learning model can be used as a reference to maximize the use of gadgets in the learning process. For schools, the school should direct and conduct training for teachers to vary learning models. And for other researchers, it is hoped that there will be further research in the use of the flipped classroom learning model in other biology learning materials and prepare sufficient media and time to socialize this learning model.

REFERENCES

Akçayır, G., & Akçayır, M. (2018). The Flipped Classroom: A Review of Its Advantages And Challenges. *Computers and Education*, *126*(January), 334–345. https://doi.org/10.1016/j.compedu.2018.07.021

Arifin, J. (2017). *SPSS 24 Untuk Penelitian dan Skripsi*. PT Elex Media Komputindo.

Baytiyeh, H. (2017). The Flipped Classroom Model: When Technology Enhances Professional Skills. *International Journal of Information and Learning Technology*, *34*(1), 51–62. https://doi.org/10.1108/IJILT-07-2016-0025

Chilingaryan, K., & Zvereva, E. (2017). Methodology of Flipped Classroom as a Learning Technology in Foreign Language Teaching. *Procedia - Social and Behavioral Sciences*, *237*, 1500–1504. https://doi.org/10.1016/j.sbspro.2017.02.236

Dangnga, M. S., & Muis, A. A. (2015). *Teori Belajar dan Pembelajaran Inovatif*. Makassar: Sibuku Makassar.

Espada, M., Navia, J. A., Rocu, P., & Gómez-López, M. (2020). Development of The Learning to Learn Competence in The University Context: Flipped Classroom or Traditional Method?. *Research in Learning Technology*, *28*, 1–11. https://doi.org/10.25304/rlt.v28.2251

Evseeva, A., & Solozhenko, A. (2015). Use of Flipped Classroom Technology in Language Learning. *Procedia - Social and Behavioral Sciences*, *206*(November), 205–209. https://doi.org/10.1016/j.sbspro.2015.10.006

Hwang, G.-J., Lai, C.-L., & Wang, S.-Y. (2015). Seamless Flipped Learning: A Mobile Technology-Enhanced Flipped Classroom with Effective Learning Strategies. *Journal of Computers in Education*, *2*(4), 449–473. https://doi.org/10.1007/s40692-015-0043-0

Nyeneng, I. D. P., Suana, W., & Maulina, H. (2018). Pengembangan Perangkat Flipped Classroom. *Jurnal Pendidikan Fisika Universitas Muhamadiyah Metro*, *4*(2), 159–174.

Ogden, L. (2015). Student Perceptions of the Flipped Classroom in College Algebra. *Primus*,

25(9), 782–791. https://doi.org/10.1080/10511970.2015.1054011

Ozdamli, F., & Asiksoy, G. (2016). Flipped Classroom Approach. *World Journal on Educational Technology: Current Issues*, *8*(2), 98–105. https://doi.org/10.18844/wjet.v8i2.640

Simanjuntak, & Dameria., S. (2020). *Statistik Penelitian Pendidikan Dengan Aplikasi Ms. Excel dan SPSS*. Surabaya: CV. Jaka Media Publishing.

Sugiyono. (2012). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.

Syarifuddin. (2018). *Inovasi Baru Kurikulum 2013 Pendidikan Agama Islam dan Budi Pekerti*. Depublish.

Tanjung, I. F. (2019). *Strategi Pembelajaran Biologi*. Medan: CV Widya Puspita.

Tatarchuk, S., & Eick, C. (2012). Case Studies and the Flipped Classroom. *Journal of College Science Teaching*, *42*(5), 62–66.

Yunita, & Windi, R. (2018). *Penerapan Strategi Flipped Classroom untuk Meningkatkan Keaktifan dan Hasil Belajar Siswa di Kelas VIII SMP 5 Ponorogo Tahun Ajaran 2017/2018 Skripsi*. Ponorogo: Universitas Muhammadiyah Ponorogo.

Zainuddin, Z., & Halili, S. H. (2022). Flipped Classroom Research and Trends from Different Fields Flipped Classroom Research and Trends from Different Fields of Study. *International Review of Research in Open and Distributed Learning*, *17*(3). https://doi.org/https://doi.org/10.19173/irrodl.v17i3.2274CopiedAn error has occurred