

The Impact of Flipped Classroom Learning Model Assisted by *Google Slide* towards the Study Result of Science Studies of Elementary School

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Received: June 4, 2022

Revised: September 13, 2022

Accepted: October 15, 2022

Published: October 31, 2022

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DOI: [10.29303/jppipa.v8i4.1717](https://doi.org/10.29303/jppipa.v8i4.1717)

Abstract: This study purpose to determine whether or not there is an effect of the flipped classroom learning model assisted by *google slides* on improving student learning outcomes in science learning materials of style and motion in everyday life. In this study, quantitative experiments using the Quasi-Experimental method and the Posttest - Only Control Group design were used to determine the increase in science learning outcomes. The sample of this study consisted of 64 fourth grade elementary school students who were divided into 2 classes, namely the experimental class and the control class. Data were analyzed using t-test statistical data. The results of the analysis that has tested based on the t-test show that there is a significant difference in learning outcomes in science with the flipped classroom learning model assisted by *google slides*. Based on the results of the research analysis and discussion, it shows that the flipped classroom learning model assisted by *google slides* can affect the science learning outcomes of style and motion material in everyday life in fourth grade elementary school students.

Keywords: Flipped Classroom learning model; Google Slides; Science learning outcomes

Introduction

Learning in the industrial era 4.0 is starting to be integrated with very fast technological progress. In the age of globalization, the development of information and communication technology (ICT) has a huge impact on the educational world, so the use of technology is very important for teachers to carry out the process of conducting learning in the classroom (Effendi & Wahidy, 2019). Learning challenges in the 21st century especially in the world of education, are the implementation of the learning process in schools in a way that not only gives teachers knowledge, but also equips students with the skills to deal with future problems (Fahrozy et al., 2022). One of the subjects that can support the development of technology is science subjects. State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

The 21st century in science subjects can apply scientific learning in which there are 4C skills, namely critical thinking which is important for students to be able to solve problems, communicative to develop ideas to be developed, collaboration so that students can exchange information with experience and experimentation, and make students active in making things that are easy and can be used in everyday life (Meilani et al., 2020). These skills support the success of students learning in science learning.

The results of science learning for elementary school students are not yet complete. In a study conducted at Government Elementary School 02 Mukomuko using experiment learning methods in scientific subjects, learning outcomes were achieved with an average student score of 65.2 (Juita, 2019). Analysis of the data obtained shows that students' learning success rates in the scientific learning process are declining. As students' learning outcomes decline in the learning process, the role of educators in learning activities is determined especially in science subjects

How to Cite:

Sholikhah, O.M., & Alyani, F. (2022). The Impact of Flipped Classroom Learning Model Assisted by Google Slide towards the Study Result of Science Studies of Elementary School. *Jurnal Penelitian Pendidikan IPA*, 8(4), 2036–2042. <https://doi.org/10.29303/jppipa.v8i4.1717>

educators need the ability to develop student creativity and innovation in order to increase their interest in the learning process (Faradita, 2018).

Changes in student behavior and learning outcomes during the learning benchmark, that is whether the student can understand the given material (Andini & Fitria, 2021). To improve the success of student learning in the learning process, educators need to be an innovative, support using different models and learning media, and guide students in the learning process. There is one learning model that educators can use to support their students' learning.

It is a flipped classroom model for science learning. By implementing the flipped classroom learning model in the learning process, the material becomes an interesting, innovative, easy-to-understand video, image, or website that works together between educators and students to improve learning outcomes. This is done to make learning more enjoyable and meaningful (Chrismawati dkk., 2021; Agustini, 2021). Class activities in the Flipped Classroom model shape students' knowledge to be more active in spending time learning by interacting with each other in discussion and experimental activities, because learning is student-centered and there are educators as facilitators (Purwitha, 2020).

The flipped classroom learning model is implemented using supporting learning media. The use of media in the current technological era is very important in the learning process because it can provide convenience for students to capture and understand learning material, so that students can improve learning outcomes and brain's absorption to always remember learning material (Wahyuningtyas & Sulasmono, 2020).

One of the uses of learning media that can support the success of the flipped classroom learning model is technology media-based *Google Slides*. *Google slides* learning media is categorized as very good in a single small group experiment with an average score of 95% in Social Studies Class IV subjects, making this learning media very effective in the learning process. This can be done objectively and interactively (Lestari et al., 2021). *Google Slides* learning media in the form of animated slides can increase collaboration between educators and students and make students actively involved, interested and motivated in the learning process (Purnama & Pramudiani, 2021).

With an attractive design, this *google slides* media can provide online learning that is not boring and can support the Flipped Classroom model to achieve predetermined learning goals. *Google slide* media is a technology-based learning media that is used before learning at school by understanding and being able to repeat the concept of learning material provided by the teacher.

This study was conducted to determine whether the flipped classroom model using *google slides* has an effect on student learning outcomes in science learning about style and motion in everyday life. Based on the problems obtained regarding the low learning outcomes of science and the use of media and learning models that are less innovative in increasing the success of science learning in elementary schools, researchers focused on conducting research to see whether or not there was an effect on science learning outcomes with the implementation of the Flipped Classroom learning model with the help of *google slides* learning media on science learning outcomes in terms of the relationship between force and motion in everyday life in fourth grade elementary school.

Method

This study was carried out by conducting quantitative studies using *quasi-experimental* methods. The design of this study is a *control group design* only after *posttest* testing. This survey was conducted at an elementary school in East Jakarta, Indonesia. The sampling method of this study is *probability sampling* using the target sample by setting the experimental class and the control class as the research sample. The sample for this study was a 4th grade elementary school student using a control class and an experimental class. The experimental class uses an flipped classroom model based on *google slides*, and the control class uses an implementation of the Expository method with lecture and question and answer methods.

The experimental class was given treatment using the inverse class model syntax with an preliminary stage; orientation and exploration stage; interpretation stage; re-creation stage; and the closing and evaluation stages. After learning is complete, each class is given an instrument that is used to see student learning outcomes in the form of a posttest in the shaped essay totaling nine questions.

The following is the research flow scheme (Figure 1). The Impact of Flipped Classroom Learning Model Assisted by Google Slide towards the Study Result of Science Studies of Elementary School. There are requirements for analysis in the study, namely with several tests as follows (Sudjana, 2016).

1. Normality test with Lilliefors test, used in order to determine whether the distribution of data from the research sample is normal or not with a significant level $\alpha = 0.05$.
2. Homogeneity tests using Fisher's exact test are used to determine if the posttest data are homogeneous.
3. The researcher tested the hypothesis using t-test to find out whether the flipped classroom model using *google slides* had an effect on the fourth-grade science learning outcomes of elementary school.

4. Finally, this study uses the *effect size* calculation to determine the size of the effect and the size of the effect of the implementation of the flipped classroom model on the learning outcomes of the 4th grade elementary school science (Santoso, 2010). The classification of the calculation results using the effect size in the Cohen's formula according to (Handayani et al., 2018) in Table 1.

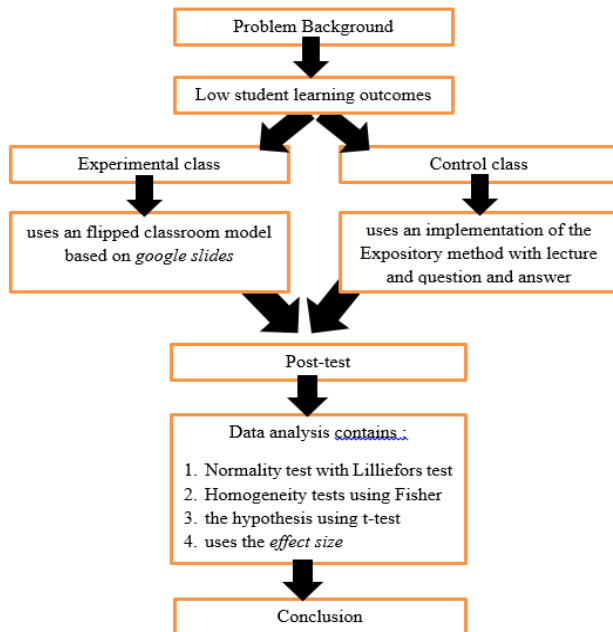


Figure 1. Research Flow Scheme

Table 1. Effect Size Interpretation Classification

Magnitude of Effect Size (d)	Interpretation
$d \geq 0.80$	High
$0.50 \leq d < 0.80$	Medium
$d < 0.50$	Low

Result and Discussion

The study was conducted in an experimental class and a control class. The experimental class study used a flipped classroom model using *Google Slides*, and the control class used an expository method using a lecture and question-and-answer model. The research data obtained from the posttest results of the experimental and control class students with the flipped classroom learning model using *google slides* for class IV provides an explanation of the centering measure and data distribution shown in Table 2.

Table 2. Summary of Statistic

Description	Experiment Class	Control Class
	Grades	Grades
Total students (n)	32.00	32.00
Mean (M_e)	86.12	73.03
Median (M_d)	87.00	72.00
Mode (M_o)	92.00	64.00
Variance (S^2)	59.60	98.55
Standard Deviation (S)	7.72	9.93

Summary of statistical data is a collection of data from the experimental class and control class related to the research data obtained. Data from research get the results $M_o > M_d > M_e$ or else $92 > 87 > 86.12$. Therefore, the results of data analysis tend to have a higher value as a result of science learning in the experimental class. While in the control class, the result is $M_o > M_d > M_e$ or else $64 < 72 < 73.03$. Therefore, the results of the data analysis receive a score that tends to be lower for the outcome of science learning in the control class. The data tested for normality used the Lilliefors test because the data being tested was single data. The results of the experimental class normality test with significance level (α) = 0.05 and the result $L_{arithmetic} = 0.106$ whereas $L_{table} = 0.157$ is obtained. The data is known that $L_{arithmetic} < L_{table}$ yaitu $0.106 < 0.157$. This shows that the data for the experimental and control classes are normally distributed (Sudjana, 2016). Table 3 shows the results of the full normality test analysis.

Table 3. Effect Size Interpretation Classification

Description	Experiment	Control
$L_{arithmetic}$	0.106	0.084
L_{table}		0.157
Results	$0.106 < 0.157$	$0.084 < 0.157$
Description	Normally Distributed Data	

The research data for the homogeneity test used Fisher's exact test to find out that the data obtained from the experimental class and the control class had the same diversity (Sudjana, 2016). Homogeneity test results get results $F_{arithmetic} = 1.65$ whereas $F_{table} = F_{0,05(31,31)} = 1.82$ with significance level (α) = 0.05. From these data it is known that $F_{arithmetic}$ less than F_{table} ($F_{arithmetic} < F_{table}$ that is $1.65 < 1.8$) then H_0 is accepted, two the variances of the two classes are said to be homogeneous. Table 4 shows the results of the complete homogeneity test analysis.

Table 4. Homogeneity Test Analysis Results

Group	Experiment	Control
n	32.00	32.00
s^2	59.60	98.55
$F_{arithmetic}$		1.65
F_{table}		1.82
Description	Homogeneous Data	

The results of the survey data show that the average score of science learning outcomes using the flipped classroom model assisted *google slides* was 86.12 and the standard deviation was 7.72, while the average science learning outcome score that did not use the flipped classroom model assisted by *google slides* was 73.03 and the standard deviation was 9.93.

From the results of the analysis prerequisite testing which includes normality and homogeneity tests, it is known that the two classes are in a normal and homogeneous distribution, so that it can be continued with research hypothesis testing using t-test and effect test (*Effect Size*).

Based on Table 4 on the mean results for the experimental and control classes, $t_{table} = 0.157$ was obtained at $t_{arithmetic} = 4.939$, significance level 0.05, and $dk = 62$. Can be seen $t_{arithmetic} = 4.939 > t_{table} = 0.157$, then H_0 is rejected. Regarding the rejection of H_0 , it can be said that the flipped classroom learning model supported by *google slides* affects the science learning outcomes of style and motion material in the daily lives of fourth grade students. Test results using the t-test revealed a rejection of H_0 . This means that the flipped classroom model using *google slides* will affect the outcome of student's science learning. Implementing a flipped classroom learning model provides an interesting way for teachers to increase their knowledge to obtain materials (Turnip & Cendana, 2021).

To find out how big the effect is, it can be calculated using the *effect size* test. Table 5 regarding the *effect size* test results obtained a result of 1.47 with an *effect size* criteria classification of $1.32 \geq 0.8$ so it can be said that the effect of the Flipped Classroom model with the help of *google slides* on the science learning outcomes of students is high.

Table 5. Result of Effect Size Test

Score Effect Size	Interpretasi
$Effect\ Size \geq 0.8$	Influence is high.
$1.32 \geq 0.8$	

The results obtained in this study show that the learning outcomes of students using the flipped classroom model are superior to the expository method. The advantage of the flipped classroom learning model is that students can learn independently and see what they have learned in class by watching videos and understanding the materials provided by the teacher (Walidah, 2020). In addition, the flipped classroom learning model can raise curiosity and have high self-confidence because students can study material and videos repeatedly (Widodo et al., 2021). Improving student learning outcomes in the flipped classroom model is to provide opportunities for students to become active learners, because students learn knowledge first before coming to class, more opportunities to work on problems during class and possibly to participate in class activities (Cho et al., 2021).

There are several components included in the process of implementing the flipped classroom learning model, namely videos with beautifully designed

teaching materials that come from making their own videos, or the internet as a learning medium to help students capture the material they are studying (Yulianti & Wulandari, 2021).

The flipped classroom model can give teachers more time in class, this can obviously increase class interaction with students and can help create a supportive learning environment (Lee & Lai, 2017). In accordance with Melati & Santi (2021) said that the Flipped Classroom learning model is a learning model behind its application, namely by diverting class activities by conveying material into conducting discussions and doing practice questions, while home learning activities are replaced by watching learning videos to understand the material to be understood for further learning.

This flipped classroom learning model is good use in learning compared to the lecture method, because the flipped classroom model can provide opportunities for students to see learning videos that can be used at any time while studying, so students can repeat material that has not understood (Saputra & Mujib, 2018).

The learning syntax in using the flipped classroom learning model is divided into several syntaxes using the CTL approach, namely the first preliminary stage by providing material in the form of teaching materials or learning videos using the WhatsApp group application, the second stage is orientation and exploration by exploring the concept of learning material with other references, the third stage of interpretation is giving assignments for group learning in finding the right concepts, the fourth stage of recreation is that students and their groups conduct experiments with the material they have learned, and the fifth stage is the final and evaluation of students who have studied the material that has been studied (Suharno, 2020).

The flipped classroom learning model can be implemented by supporting learning media. The success of the learning process can be supported by the presence of information and communication technology (ICT) with the abilities of students to facilitate the learning process and make it easier for students to access learning materials in the form of visual, audio and audio-visual (Huda, 2020). The use of technology changes the concept of education and progress for students and teachers. Therefore, the introduction of technology in education is very important (Rahmati et al., 2021). Information and Communication Technology (ICT) based multimedia materials can be adapted, shared and retained, making informal learning and experiences more effective and interactive (Alobaid, 2020).

Google Slides is an interactive presentation media other than Microsoft Power Point which More interesting and innovative in presenting *online* and *offline* materials (Rismayanti, 2020). *Google Slides* media helps students understand the learning taught by

educators, so that students can achieve successful science learning by studying the display of material and without the limitations of space and time (Purnamasari, 2019). This *google slides* application can help educators in sharing learning materials online, making it more interesting and interactive and students can learn the material anytime and learning. The media display design using Google Slides is shown in picture 1,2 and 3. Figure 1 illustrates the initial design on *Google Slides* media about styles and movements in everyday life. Figure 2 illustrates one of the displays of teaching materials on *google slide* media. Figure 3 illustrates a learning video by inserting it into YouTube with the link: <https://www.youtube.com/watch?v=YqzAJK4dfIY&t=2s>



Figure 2. An early design view of *google slides* media on learning style and motion in everyday life



Figure 3. One of the views of the learning material design on *google slides* media



Figure 4. Display of learning videos on *google slide* media

The use of technology-based *google slides* media has several advantages in the learning implementation process. Utilization of ICT-based learning media can make it easier for educators to deliver material, make learning more fun, varied and can increase students' interest in understanding the material presented by educators (Rahmadhani, 2021). This research was conducted using the elaboration of the flipped classroom learning model with the help of *google slides* media. The elaboration cannot be separated from the syntax of the flipped classroom learning model, the form of elaboration of force and motion material in everyday life can be seen in Table 6.

Table 6. Elaboration of the flipped classroom learning model with the help of *google slide* media

Syntax of the flipped classroom learning model	Flipped Classroom Learning Model Activities assisted by <i>Google Slides</i>
Preliminary Stage	<ol style="list-style-type: none"> 1. Educators provide learning materials at home in the form of learning videos, learning materials using <i>google slide</i> media such as pictures 1 and 2. 2. Students can mention examples of the relationship between force and motion in the environment after observing learning materials through <i>google slides</i> that have been previously observed at home.
Orientation and Exploration Stage	<ol style="list-style-type: none"> 1. Students exchange information about the material they get at home with a predetermined group. 2. Students discuss the relationship between force and motion in the school environment after observing learning materials at home.
Interpretation Stage	Students discuss examples of the relationship between force and motion in the school environment according to their effect on objects by comparing them with the material they have read on <i>google slides</i> .
Re-creation Stage	<ol style="list-style-type: none"> 1. Students experiment with their groups according to the material in the Student Worksheet (SW) given regarding the relationship between force and motion in the school environment. 2. Students and their groups discuss the experimental results that have been obtained. 3. Students present the results of their group discussions in front of the class in turn.
The closing and Evaluation Stages	<ol style="list-style-type: none"> 1. Students answer the teacher's questions about the discussion or learning material they have learned. 2. Students together conclude the material for force and motion in everyday life.

Based on the syntax of the flipped classroom learning model created and the details using the above findings, the flipped classroom learning model supported by *google slides* influences the outcome of 4th grade science learning on style and movement. The importance of creativity skills in science education in the 21st century, students should have more opportunities to face science problems while studying science learning (Oh & Kang, 2019). It can be said that science learning on Materials style and motion everyday life by using 4C skills included in science learning and the development of information technology that influences the outcome of science learning in the 21st century.

Conclusion

With the technology-assisted flipped classroom learning model, namely *google slides*, it can affect science learning outcomes with the results of data being normally distributed and homogeneous data. Meanwhile, the results of the data that have been t-tested get H_0 rejected and the *effect size* test is classified as high. Based on the results of the analysis and discussion in this study, it can be concluded that the flipped classroom learning model supported by *google slides* can affect the science teaching style and learning outcomes of everyday life in fourth grade elementary school students. The technology-assisted learning model has an impact on the process of implementing learning in the 21st century that is interesting and meaningful.

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