Volume 05 Issue 02 (2024) Pages 175 – 185
Journal of Social Science and Education
e-ISSN: 2722-9998, P- ISSN: 2723-0007
Available online at: https://jurnal.iainponorogo.ac.id/index.php/asanka

IMPROVING STUDENT LEARNING OUTCOMES THROUGH THE FLIPPED-PROJECT BASED LEARNING MODEL: AN EXPERIMENTAL STUDY

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ARTICLE INFO

Article history:
Received: January 30, 2024
Accepted: August 29, 2024
Published: August 30, 2024

Keywords:
Flipped Classroom; Flipped-Project Based Learning; Learning Outcomes

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ABSTRACT

This study aims to determine the effectiveness of the Flipped-Project-based Learning model on student learning outcomes. This type of quasi-experimental research uses a control group pretest-posttest design that is applied to class XI IPS SMA Negeri 8 Malang, Indonesia (social sciences program at State Senior High School) academic years 2023-2024. The instrument used is an essay test of 5 questions on International Economic Cooperation material that has been tested for validity and reliability. Data analysis used tests of normality, homogeneity, and independent sample t-test. The result of the study showed that the Flipped-Project Based Learning model was effective in improving students' student learning outcomes in Economics Lessons. Recommendations for further research, it is necessary to develop a project-based model in a blended or hybrid model by utilising digital learning or e-learning platforms.

INTRODUCTION

Education, which is a crucial element in a country's progress to prepare a superior generation, has a significant impact. As the frontline in the learning process, educators need to develop learning designs that are appropriate to the current context, while paying attention to the quality of learning outcomes, effectiveness and efficiency of learning (Putra, 2020). The influence of the digital revolution has brought about major changes, including teaching and learning methods (Liriwati, 2023; Tsoraya et al., 2023). Unlike past students, today's students are very different. Therefore, it is difficult to attract students' interest and curiosity for traditional learning activities. Moreover, using

outdated methods is not an easy thing to solve some learning and teaching problems (Sohaya, 2019).

This condition often occurs in the learning process, students are faced with subjects that memorise too much material such as economics (Rosy, 2018). Most students of economics lessons are seen as uninteresting and boring subjects, whereas in learning economics, a learning innovation is needed which is the basis for developing further material. Passive learning will inhibit student activeness in the mindset of students understanding economic subject matter. Sasti et al. (2022) revealed, the problem in the use of learning models applied by teachers, namely a tendency to misunderstand that economics lessons are lessons that tend to memorise. This understanding results in learning that emphasises learning on verbalism, meaning that teachers in applying learning models emphasise more on teacher activity or teacher-centred learning, not on student activity (Kaput, 2018). Learning conducted by the teacher is less varied. For example, the teacher mostly uses the lecture method and even tells students to sit, take notes and listen.

This is exacerbated by the learning outcomes of class XI in Economics at SMA Negeri 8 Malang. Many grade XI students did not meet the minimum completion criteria (KKM). The percentage of students who successfully achieved the KKM in the subject was only 57% of the total 60 students. The cause of the low learning outcomes in Economics can be traced to the dominant teacher-centred learning pattern in the school. Teachers are more likely to provide material by telling stories or lecturing, then giving example problems without actively involving students. The absence of student projects and independent involvement in tasks makes the learning process less involving. As a result, students do not actively participate in learning activities, do not dare to express their opinions, lack confidence, tend to make noise, and often go in and out of class during the learning process.

To overcome these problems, teachers can implement an innovative learning model, one of which is the combination of the Project Based Learning-Flipped Classroom learning model. This model is a combination of Project Based Learning (PjBL) model with Flipped Classroom (FC). Project Based Learning is a learning method that involves students working in groups to develop a report, experiment, or other project (Fleming, 2000; Kokotsaki et al., 2016; Maros et al., 2023; Mudlofir & Rusyidiyah, 2017). Whereas the flipped classroom is the opposite of the traditional classroom (Akçayır & Akçayır, 2018). In traditional learning, students receive material in class and then are given assignments to do at home. Whereas in a flipped classroom, students learn the material at home and do the assignments in class (Mujiono, 2021; Sohrabi & Iraj, 2016).

The combination of PjBL and Flipped Classroom is an innovative approach to learning that uses technology and project-based learning concepts. Chua & Islam (2021) explained that in its implementation, teachers first provide preconditioning materials, such as videos, articles, or online resources, which students can access at home. Students then prepare themselves by understanding basic concepts related to a particular

topic before entering the class. In the classroom, time is allocated for thought-provoking activities, discussion and introduction of projects. Students are divided into groups to work on projects that involve problem-solving, collaboration, and application of concepts learnt. The teacher serves as a facilitator providing guidance throughout the process, while providing periodic feedback. Upon completion, students present the results of their project to the class, followed by reflection both individually and in groups.

The combination of the Project Based Learning model with Flipped Classroom can provide a meaningful learning experience for students, encourage active involvement in discussion activities, and reduce the risk of a decline in learning understanding (Pratiwi & Santyasa, 2021). According to Siburian et al., (2022) Combining Project Based Learning and Flipped Classroom models can create more active learning and stimulate collaboration among learners. By combining the Project Based Learning approach with Flipped Classroom, the learning process becomes more dynamic (Alvarez et al., 2017). Combining Project Based Learning with Flipped Classroom, as revealed by Sunaryati et al. (2023), significantly affects learning motivation and learning achievement. The novelty of this research is carried out on Economics learning by using the Project Based-Flipped Learning model. The purpose of this study was to examine the effectiveness of improving Economic learning outcomes after being given the application of the Flipped-Project Based Learning model at SMA Negeri 8 Malang.

RESEARCH METHOD

This research used a quasi-experimental because a researcher cannot control the subject. The researcher used a pretest-posttest control group design type (see table 1). The research subjects were students of class XI IPS SMA Negeri 8 Malang, Indonesia (social sciences programme at State Senior High School) in the academic year 2023-2024. Each number of students in the experimental class (Class XI IPS 1) as many as 30 people and the control class (Class XI IPS 2) as many as 30 people selected through purposive sampling technique, which is based on the criteria of classes that have almost the same average ability. Proven by the average daily test scores that are almost the same, so that XI IPS 1 class is obtained as an experimental class and XI IPS 2 class as a control class.

Table 1. Control group pretest-posttest design

Group	Pretest	Treatment	Posttest
Experiment	O_1	X	O_3
Control	O_2	-	O_4

Source: Creswell & Creswell (2018)

Description:
O1 : Pretest for experimental class

O2 : Pretest for control class
X : Flipped-Project Based Learning
O3 : Posttest for experimental class
O4 : Posttest for control class
- : Conventional learning (lecture and discussion)

Data collection in the experimental class by applying the Flipped-Project Based Learning model, through steps as in table 2 below.

Table 2. Syntax of the flipped-project based learning model

Syntax	Learning Activities
Pre-class	Students watch learning videos about International Economic Cooperation: https://www.youtube.com/watch?v=DvTGd3hiCEE
In-class	Students view instructional videos, participate in conversations, then apply and analyze the content when the instructor certifies their understanding
Setting project theme and goals	In order to solve the problem, the students choose the project's theme
Planning project completion	The project's concept is developed by the students in order to solve the issue; tasks include reading references, doing research, compiling information, observing, interviewing, and writing. The instructor supervises and monitors the pupils' development
Completing projects	While the teacher monitors and evaluates their progress, the students sketch, analyze, and compute
Project reporting and presentation	Students presentation their work and turn in assignments..

Soucre: Adaptation of Bergmann & Sams (2012) and Listiqowati et al. (2022)

The learning outcome assessment instrument used in this study is an essay test based on learning indicators. The use of essay tests in this study is based on the argument that the use of essay questions is considered more appropriate for the achievement of learning outcomes of students who have participated in learning with the PjBL model, especially on the material of International Economic Cooperation. The learning outcome assessment instrument in this study was declared valid (table 3) and reliable (Cronbach's Alpha value = 0.737).

Tabel 3. Instrument validity test results

Item	Correlations	Total	r table	Decision
P1	Pearson Correlation	.633**		
	Sig. (2-tailed)	.000	0.456	Valid
	N	31		
P2	Pearson Correlation	.705**		
	Sig. (2-tailed)	.000	0.456	Valid
	N	31		
P3	Pearson Correlation	.641**		
	Sig. (2-tailed)	.000	0.456	Valid
	N	31		
P4	Pearson Correlation	.750**		
	Sig. (2-tailed)	.000	0.456	Valid
	N	31		
P5	Pearson Correlation	.775**	0.456	Valid

	Sig. (2-tailed)	.000
	N	31

**. Correlation is significant at the 0.01 level (2-tailed).

Data analysis used normality test, homogeneity test, and independent sample t-test assisted by SPSS 23.0 for Windows with a significance level of 0.05. The decision taken is based on hypothesis testing on the data of the acquisition of learning outcomes scores. Hypothesis testing in this study is as follows.

H0 : there is no difference in student learning outcomes before and after using the Flipped-Project Based Learning model in learning.

H1 : there is a difference in student learning outcomes before and after using the Flipped-Project Based Learning model in learning.

RESULTS AND DISCUSSION

The combination of Flipped Learning and Project-Based Learning (PBL) starts with defining the learning objectives and designing a relevant project. The teacher then provides learning materials, such as videos or readings, that students should study at home. After students have studied the material independently, the class begins with a discussion to clarify students' understanding before grouping students to work on the project. The teacher monitors and guides students during the project work, providing feedback at regular intervals. Once the project is complete, students present the results and reflect on the learning process. Finally, an evaluation is conducted to assess learning outcomes and plan for further development.

Figure 1. Analysing the Material to be Studied

Figure 2. Grup Discussion

Figure 3. Project Presentation

Figure 4. Group Evaluation with the Highest Score

Based on the test results through the gain score in Figure 1, the learning outcomes in the experimental group using the Flipped-Project Based Learning model from 51.23 to 79.97 increased by 28.73. Furthermore, the gain score of learning outcomes in the control group using conventional learning from 43.83 to 62.90 increased by 19.07. The gain score value shows an increase in learning outcomes. Based on these data, it shows that the data of the experimental class learning outcomes using the Flipped-Project

Based Learning model is higher than the control class.

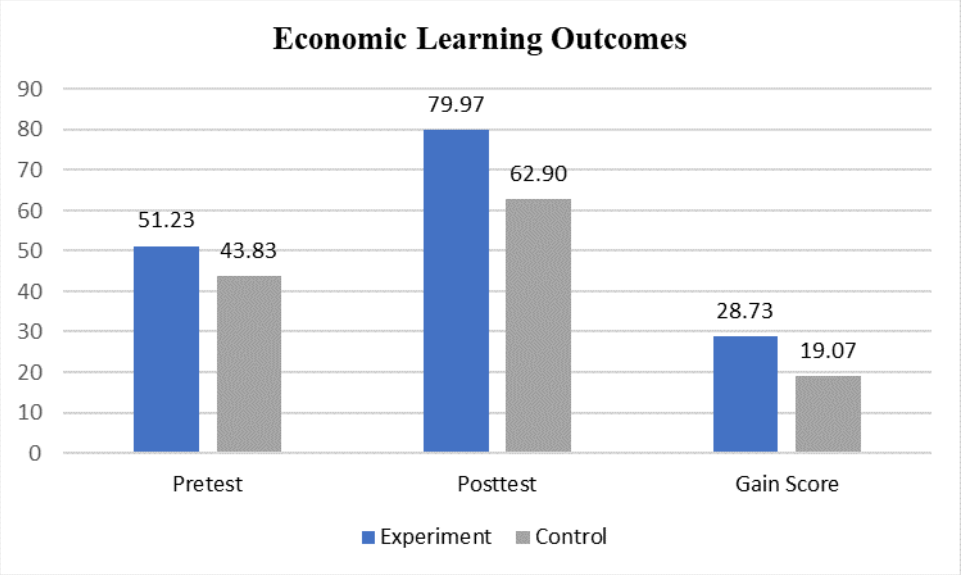

Figure 1. N gain score of student learning outcomes

Furthermore, the results of the data homogeneity test in this study can be seen in table 4 below.

Table 4. Normality test of student learning outcomes

Class	Kolmogorov-Smirnova		
	Statistic	df	Sig.
Experiment	.098	30	.200*
Control	.101	30	. 200*

The normality test results in table 4 obtained a sig value. 0.200 > α = 0.05 for the experimental class and sig value. 0.200 > α = 0.05 for the control class. Based on these statistical results, it can be concluded that the learning outcomes data in both classes are normally distributed.

The normality test results for the gain score data of Economics learning outcomes can be seen in table 5 below.

Table 5. Homogeneity test of student learning outcomes

Levene Statistic	df1	df2	Sig.
1.554	1	58	.219

Table 5 shows that the result of the homogeneity test is the sig. value = 0.219 > 0,05. So it can be concluded that the learning outcome data is homogeneous. Based on the prerequisite test results that the research data is normally distributed and homogeneous. Furthermore, an independent analysis test was conducted using the t-test. The results of the independent sample t-test analysis test can be seen in table 6 below.

Table 6. Independent sample t-test results

Class	N	Mean	SD	T	Df	Sig. (2-tailed)
Experiment	30	28.73	16.985	2.374	58	.021
Control	30	19.07	14.458			

Table 6 shows an average gain score of 19.07 for the control class and an average gain score of 28.73 for the experimental class, which is higher than the control class. The results of the independent test yielded a significance level of less than 0.05, or sig. = 0.021, according to the sample t-test applied to the gain score data for Economic learning outcomes. Thus, it can be concluded that there are appreciable variations in the economic learning results prior to and following the adoption of the Flipped-Project Based Learning approach. Rejecting hypothesis H0 and accepting hypothesis H1 leads to this result. Students' learning outcomes in the area of economics are greatly improved by the Flipped-Project Based Learning approach. Based on the test results, it can be concluded that the Flipped-Project Based Learning model is more effective than the conventional approach in improving students' learning achievement. By using this type of instruction, students may practice studying independently at home before participating in group discussions (Béres & Kis, 2018). This leads to an improvement in students' learning outcomes in their comprehension of Economics topics as they have a solid enough foundation to follow the learning process and finish group projects more successfully.

Research carried out by Rahman et al. (2015) suggested that students may be inspired to take on different roles and actively participate in the learning process by using the Flipped-Project Based Learning Model. This supports constructivism's tenets, which place a strong emphasis on student-centered learning. In this instructional framework, the instructor guides or facilitates students' learning without being involved in their project work directly (Saputro & Pakpahan, 2021). As a result, students take the initiative to define and choose projects based on their prior knowledge and research using a variety of learning tools (Budyastuti & Fauziati, 2021). Another advantage of the Project-Based Flipped Learning model lies in giving students more time and experience in the learning process and practice of organising projects, including time allocation and resources such as equipment needed to complete tasks. So that student learning outcomes increase after the implementation of the Flipped-Project Based Learning model. This is supported by research conducted by Zarouk et al. (2020) that the Flipped-Project Based Learning model provides more free time than other learning models so that students can maximise time to complete project tasks.

The results of this study are in line with the findings of previous studies, such as those conducted by Pratiwi & Santyasa (2021) and Listiqowati et al. (2022). The latter study involved a quasi-experimental method by applying a project-based model combined with a flipped classroom, and the results showed an increase in learning achievement in students who followed learning using the Flipped-Project Based Learning model. In addition, the positive effect of project-based learning and flipped

learning models on learning achievement is also reflected in the results of research by Joung et al. (2018), Moreno-Ruiz et al. (2019), and Rahman et al. (2016). These studies confirmed that the implementation of both learning models had a significant positive impact on students' learning achievement and learning outcomes. As such, these findings collectively contribute additional evidence regarding the effectiveness of the Flipped-Project Based Learning model in improving student learning achievement, enriching the understanding of the benefits of implementing both in an educational context.

CONCLUSION

The combination of Flipped Learning and Project-Based Learning (PBL) is an integrated approach that blends individual learning with group collaboration. In this model, Flipped Learning enables students to study materials at home through videos or readings, while PBL encourages them to apply their knowledge in practical, classroom-based projects. The Flipped-Project Based Learning model has a notable impact on student learning outcomes, particularly in Economics lessons on International Economic material, as it fosters students' learning independence. By allowing students to independently and collaboratively identify and define projects based on their acquired knowledge, this approach encourages deeper understanding and maximizes learning outcomes. However, a limitation of this study is the insufficient time allocated for project work and presentation, often leading to incomplete projects and suboptimal results. Therefore, it is recommended to extend the time allocated for project development. Additionally, there is a need to further develop a blended or hybrid project-based model by integrating digital learning and e-learning platforms.

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