Using the Flipped Classroom as a Teaching Model to Enhance Financial Literacy

Anggono[1*], Rini Herliani[2], Siti Aisyah Nasution[3], Sauh Hwee Teng[4], Noppakao Naphatthalung[5]

[1]Faculty of Social Science and Humaniora, Universitas IBBI, Medan, North Sumatera, Indonesia
anggono50@gmail.com
[2]Faculty of Economy, Universitas Negeri Medan, Deli Serdang, North Sumatera, Indonesia
riniherliani@unimed.ac.id
[34]Faculty of Economy, Universitas Prima Indonesia, Medan, North Sumatera, Indonesia
sitiaisyahnasution@unprimdn.ac.id
tengsauhhwee@unprimdn.ac.id
[5]Faculty of Education, Department of Curriculum and Instruction, Thaksin University, Songkhla, Thailand
nop_pakoa@hotmail.com
[*]Corresponding Author

https://doi.org/10.24191/ajue.v21i1.29

Received: 28 November 2024
Accepted: 31 May 2025
Date Published Online: 30 June 2025
Published: 30 June 2025

Abstract: The focus of the problem in this research is the low financial literacy of students. The purpose of this research is to examine the difference between flipped classroom and problem based learning on students' financial literacy in order to find the appropriate teaching model for financial literacy learning. The research location is ABC University in Indonesia. The type of research conducted is quantitative research with a quasi-experimental method. The experimental research design used was a pretest-posttest non-equivalent group design. The research population consisted of 60 students of the faculty of economics and business. The number of samples in this research were 52 students selected by lottery through simple random sampling. The research instrument used to obtain data in this research used an essay test. This research uses descriptive statistics and inferential statistics to analyse data and test hypotheses. The results showed that flipped classroom and project-based learning were able to improve students' financial literacy. It can be concluded that flipped classroom is a better teaching model than project-based learning in teaching financial literacy. Research suggestions that can be given are to use samples from various educational backgrounds and further researchers use factorial design by adding financial knowledge.

Keywords: Financial Literacy, Flipped Classroom, Project Based Learning

1. Introduction

Financial literacy is a subject taught to students in the faculty of economics and business. Financial literacy refers to a person's financial knowledge and skills in managing financial resources to achieve financial stability (Abdullah et al., 2017). The purpose of studying financial literacy is to make wise decisions in allocating financial resources to achieve financial well-being and stability (Abdullah et al., 2017). Individuals with high financial literacy are adept at managing investments, budgeting, consumption, and credit (Lantara & Kartini, 2015). Conversely, those who lack financial literacy may find it challenging to achieve financial well-being due to poor decision-making in managing their resources (Chen & Volpe, 1998). Thus, financial literacy is a skill that students need to allocate financial resources effectively and efficiently so that they can achieve financial well-being in their daily lives.

However, in reality, not all students have a strong grasp of financial literacy. This issue was found at ABC University, where many students faced difficulties in understanding financial literacy concepts. From the interview with the lecturer who teaches financial literacy, it was mentioned that the topics covered for students include financial general knowledge, saving, borrowing, insurance, and investment, in accordance with the reference from (Chen & Volpe, 1998). The learning outcome data provided by the financial literacy lecturer is attached in the table below.

Table 1

Financial Literacy Learning Outcome

	Financial Literacy Topics	Population	Passed (Test Score > 76)	Not Passed (Test Score < 76)
1	Financial General Knowledge	60 Students	48 Students	12 Students
2	Saving	60 Students	36 Students	24 Students
3	Borrowing	60 Students	28 Students	32 Students
4	Insurance	60 Students	20 Students	40 Students
5	Investment	60 Students	18 Students	42 Students

Table 1 showed that the financial literacy learning outcomes of students tend to decline. This means that the longer students study financial literacy, the less they understand it. If this continues, it will have negative consequences for students, as they greatly need financial literacy to address issues related to financial resource allocation both in the workplace and in everyday life.

From the interviews with lecturer regarding the low financial literacy learning outcomes of students and the challenges in teaching financial literacy, the lecturer mentioned that he had made significant efforts to improve students' financial literacy by revising the curriculum, utilizing financial literacy modules, and providing financial literacy workshops, as suggested by several previous studies (Abitoye et al., 2023; Ehrlich & Guilbault, 2017; Wolla, 2017). However, these efforts have not yielded optimal results in financial literacy education. Additionally, he expressed that he does not have a strong grasp of various teaching methods, as he come from non-education backgrounds, leading him to rely on traditional lecture methods throughout the course. Furthermore, the lecturer indicated that the learning objective of creating a portfolio has not been achieved due to a lack of time for instruction. From the previous descriptions, it can be concluded that the lecturer face challenges related to pedagogical competence and classroom time.

The main objective of financial literacy education, according to the lecturers teaching financial literacy, is to create diversification in financial portfolios. From the perspective of Anderson's revised Bloom's Taxonomy Theory, which states that the ability to create is the highest level of this theory, students require adequate knowledge, understanding, application, analysis, and evaluation skills before they can successfully create a diversified portfolio (Anderson et al., 2001). Observations of the teaching methods used by the lecturers, which are primarily traditional lectures, indicate that they only provide knowledge to the students, without fostering their understanding, application, analysis, evaluation, and creation skills.

The flipped classroom is believed to address the low financial literacy learning outcomes of students. The flipped classroom is a reversed learning model where educational materials are delivered outside of class using an online learning management system (Ishartono et al., 2022). There are several reasons why the implementation of the flipped classroom can enhance financial literacy. First, delivering learning materials outside of class hours greatly assists lecturers, as students will have a foundational understanding of financial literacy before entering the classroom, allowing lecturers to focus on students' skills in understanding, application, analysis, evaluation, and creation during class. Second, this approach can improve student performance, motivation, awareness, and the overall quality of learning (Cuetos, 2023). Third, the implementation of the flipped classroom has been shown to enhance student learning outcomes based on previous research (Cuetos, 2023; Ishartono et al., 2022; Kapil, 2019; Santos & Serpa, 2020).

This research presents a unique approach to implementing the flipped classroom, differing from previous studies. Typically, a flipped classroom involves three phases: before class, during class, and after class (Cuetos, 2023; Kapil, 2019; Santos & Serpa, 2020). The steps in this study are adapted to the resources and context of the educational institution. First, the lecturer introduces the learning objectives. Second, a Google Classroom link is provided for students to access materials like books, videos, and PowerPoint presentations for independent study. Third, the lecturer conducts a brief in-class session and presents a case for discussion and debate. Fourth, feedback is given on the case. Finally, students are encouraged to continue learning by reviewing the previously covered materials. Overall, it is expected that this flipped classroom approach will improve students' financial literacy.

One teaching model that is believed to enhance students' financial literacy is project-based learning. Project-based learning involves assigning a project to students for them to complete (Deng, 2022). This method is chosen to educate students because it develops their higher-order thinking skills. For example, students are given a project related to creating a diversified portfolio by allocating a company's funds into investments, insurance, loans, and other investments. While working on this project, students will use their knowledge and understanding of finance to calculate the allocation of the company's funds, and then analyze and evaluate the most profitable allocation for creating the portfolio. Additionally, project-based learning can improve teamwork, critical thinking, communication skills, creativity, and overall learning outcomes for students (Deng, 2022; Lu & Yan, 2023; Martinez & Andújar, 2020; Young & Legister, 2018).

The steps of project-based learning in this research differ from those in previous studies. Generally, project-based learning consists of five stages: project selection, planning, implementation, dissemination, and evaluation (Deng, 2022). Martinez & Andújar (2020) outlined similar steps, including defining learning objectives, forming groups, implementing projects, and evaluating them. In this research, the project-based learning process includes several specific stages: First, the lecturer explains the learning objectives. Second, the lecturer forms research groups. Third, the lecturer provides a brief overview of the learning material. Fourth, the lecturer gives directions for the student projects. Fifth, the lecturer supervise the project during study time. Finally, the lecturer evaluates the students' projects. Therefore, it is expected that project-based learning will enhance students' financial literacy.

This research has two differences from previous research. First, previous studies investigated finance using survey methods (Abdullah et al., 2017; Firli, 2017; Venkataraman & Venkatesan, 2018), whereas this research employs a quasi-experimental method. Second, previous studies applied flipped classroom and project-based learning to financial management learning outcomes (Cuetos, 2023; Deng, 2022; Kapil, 2019; Lu & Yan, 2023; Martinez & Andújar, 2020; Santos & Serpa, 2020), while the current research focuses on the application of flipped classroom and project-based learning to financial literacy learning outcomes.

The research questions that can be posed in this study consist of three main questions. First, does the flipped classroom have a positive impact on students' financial literacy? Second, does project-based learning positively affect students' financial literacy? Third, is the financial literacy of students taught using the flipped classroom higher than that of students taught using project-based learning? The benefits of this research include several aspects. First, this research is useful for examining the effects of flipped classroom and project-based learning on students' financial literacy. Second, this research aims to identify the best teaching model between flipped classroom and project-based learning for enhancing financial literacy. Third, this research is expected to provide recommendations for the implementation of flipped classroom and project-based learning to improve financial literacy.

2. Method

This research used a quasi-experimental method. The reason for using this method is to analyse the difference in effectiveness of teaching methods to improve students' financial literacy. The research design in this research used a pretest-posttest non-equivalent group design. The research design can be seen in Table 2.

Table 2

Research Design

Group	Pre-test	Treatment	Post-test	n
Experiment	Y1	X	Y3	26 Students
Control	Y2	-	Y4	26 Students

(Cohen et al., 2007)
Description:
Y1 & Y2 = Pre-test
X = Flipped Classroom
- = Project Based Learning
Y3 &Y4 = Post-test

The research's population consisted of 60 accounting students who were in the fourth semester at ABC University. The Slovin calculator was used to determine the sample size for this experiment, which was 52 students. Simple random sampling was employed as the sampling method because simple random sampling provides equal opportunities to all students to become research samples. Simple random sampling in this research was carried out by lottery so that the sample was truly randomly selected.

In this research, simple random sampling was conducted by lottery to ensure that the sample was truly randomly selected and then allowing the research results to be widely generalized. The data was collected using a test in this research. Before the test is administered to the actual respondents, it will undergo a validity assessment using product moment correlation, a reliability, test with Cronbach's Alpha, an evaluation of test difficulty, an analysis of discrimination power, and a content review to ensure that the descriptive questions align with financial literacy. More details can be found in the table below.

Table 3

Instrument Testing

Item	Indicator	$r_{statistic}$	r_{table}	Interpretation	DT	DP
01	Financial General Knowledge	0.855	0.444	Very Significant	Easy	Good
02	Saving	0.826	0.444	Very Significant	Medium	Good
03	Borrowing	0.915	0.444	Very Significant	Medium	Good
04	Insurance	0.852	0.444	Very Significant	Medium	Good
05	Saving	0.814	0.444	Very Significant	Medium	Good
06	Investment	0.809	0.444	Very Significant	Medium	Good
07	Borrowing	0.884	0.444	Very Significant	Hard	Good
08	Insurance	0.925	0.444	Very Significant	Medium	Good
09	Financial General Knowledge	0.893	0.444	Very Significant	Easy	Good
10	Investment	0.919	0.444	Very Significant	Hard	Good
-	Cronbach's Alpha Coefficient	0.980	-	Very High Reliability	-	-

Description:
DT = Difficulty of Test
DP = Discrimination Power

Table 3 summarizes the results of instrument testing for the research on financial literacy, presenting ten items linked to various indicators such as general knowledge, saving, borrowing, insurance, and investment. Each item is evaluated through its correlation coefficient (r statistic), which ranges from 0.809 to 0.925, all exceeding the critical value of 0.444 and deemed "Very Significant."

The difficulty levels of the items are categorized as "Easy," "Medium," or "Hard," with a predominance of medium-level questions, while all items are classified as having "Good" discrimination power, effectively distinguishing between different levels of test-taker understanding. The table also highlights a high Cronbach's Alpha Coefficient of 0.980, indicating "Very High Reliability," thus confirming that the instrument reliably measures financial literacy concepts. The data collected in this research was analysed using descriptive and inferential statistics by using paired and independent sample t-tests.

3. Result and Discussion

3.1 Result

The research involved a pre-test for both experimental and control classes, comparing their initial financial literacy skills. The second stage involved observing the implementation of flipped classroom in the experimental class and project-based learning in the control class. The third stage concluded with a post-test to determine the final ability of students in financial literacy. The collected data is presented in a table.

Table 4

Demographic Respondent

Category	Sub-Category	Total	n	Percentage
Gender	Male	20	52	38.46 %
	Female	32	52	61.54 %
Occupation	Full-Time Student	10	52	19.23 %
	Part Timer	8	52	15.38 %
	Finance Staff	6	52	11.54 %
	Accounting Staff	2	52	3.85 %
	Administrator	10	52	19.23 %
	Banker	6	52	11.54 %
	Entrepreneur	3	52	5.77 %
	Others	7	52	13.46 %

Table 4 presented the demographic data of respondents. In terms of gender, 20 participants (38.46%) were male, while 32 (61.54%) were female. Regarding occupation, the respondents included 10 full-time students (19.23%), eight part-timers (15.38%), six finance staff members (11.54%), two accounting staff (3.85%), 10 administrators (19.23%), six bankers (11.54%), three entrepreneurs (5.77%), and seven individuals in other occupations (13.46%). This data highlights the gender distribution and the diverse range of occupations among the participants. The next table shows the pre-test and post-test results of the flipped classroom and project-based learning the results are more clear; it can be seen in Table 5.

Table 5

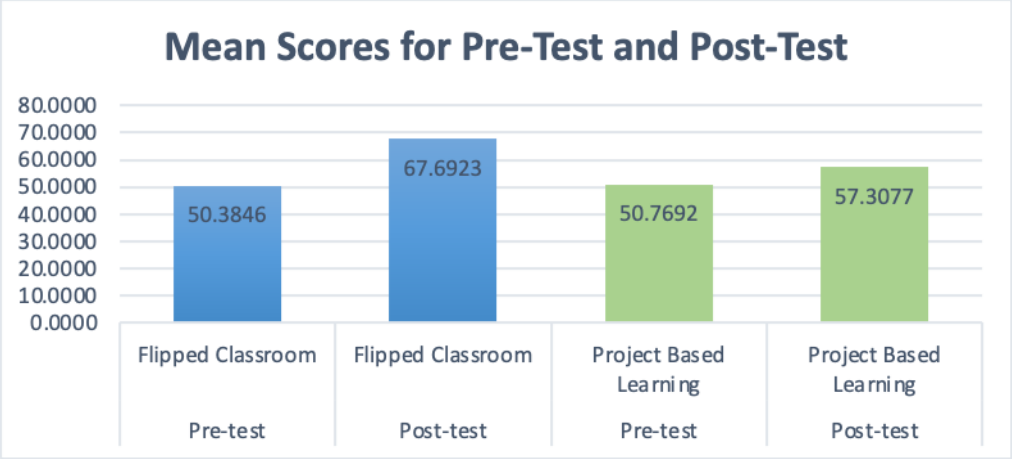
Descriptive Statistic

	Teaching Model	Mean	Standard Deviation	Minimum	Maximum
Pre-test	Flipped Classroom	50.3846	18.21664	20	80
	Project Based Learning	50.7692	20.76980	20	90
Post-test	Flipped Classroom	67.6923	14.50729	40	90
	Project Based Learning	57.3077	16.62713	30	90

The data on teaching models revealed the mean scores, standard deviations, and ranges for pre-test and post-test results. For the pre-test, students in the flipped classroom had a mean score of 50.38 with a standard deviation of 18.22, while those in project-based learning had a slightly higher mean of 50.77 and a greater standard deviation of 20.77. In the post-test, the flipped classroom participants achieved a mean score of 67.69 with a standard deviation of 14.51, compared to 57.31 for project-based learning, whjioich had a standard deviation of 16.63. The data indicate that both teaching models positively affect financial literacy. For more details on the development of financial literacy taught by each model, please refer to the graph below.

Figure 1

The Improvement of Flipped Classroom and Project Based Learning



From the figure above, it can be concluded that financial literacy taught using the flipped classroom and project-based learning has increased from pre-test to post-test. Initially, the experimental class, which was taught with a flipped classroom, did not differ significantly from the control class, which was taught with project-based learning in the beginning. However, both showed a significant difference in the post-test, with the flipped classroom demonstrating much better results than project-based learning. Table 6 shows the results of the normality test with Shapiro-Wilk and the homogeneity test using Levene's Test.

Table 6

Result of the Normality and Homogeneity Test

	Teaching Model	Shapiro-Wilk (Test of Normality)	Levene's Test (Test of Homogeneity of Variances)
Pre-test	Flipped Classroom	0.124	0.374
	Project Based Learning	0.124	
Post-test	Flipped Classroom	0.083	0.584
	Project Based Learning	0.173	

The normality test results indicate that both the flipped classroom and project-based learning pre-test data are normally distributed, with significance values of 0.124 and 0.083, respectively, both exceeding the alpha level of 0.05. Additionally, the project-based learning post-test data also showed normal distribution with a significance value of 0.173. Consequently, it can be concluded that all data in this research are normally distributed.

In terms of homogeneity, the test results for both the pre-tests and post-tests for the flipped classroom and project-based learning showed a significance value of 0.374, which is greater than

0.05. This indicates that the data have the same variance, confirming homogeneity across the groups. Following these tests, the next stage is hypothesis testing, the results of which are detailed in Table 7 below. After the normality test and homogeneity test are carried out, the next stage is hypothesis testing, the results of hypothesis testing can be seen in table 7 below.

Table 7

Hypothesis Testing

Hypothesis	Inferential Statistic	Sig.	Interpretation
First	Paired Sample T-Test (Flipped Classroom)	0.000	Accepted
Second	Paired Sample T-Test (Project-Based Learning)	0.014	Accepted
Third	Independent Sample T-Test	0.020	Accepted

Based on the results presented in the previous table, it can be concluded that all three hypotheses proposed in this research were accepted at the five percent significance level, as all hypothesis significance (Sig.) values were below 0.05.

3.2 Discussion

The flipped classroom has a positive and significant effect on financial literacy because the flipped classroom can improve students' financial literacy. A flipped classroom provides convenience and opportunities for students to access learning materials related to financial literacy before the class begins. In this research, students access the Learning Management System (LMS) using Google Classroom which contains books related to financial literacy, financial literacy learning videos, and financial literacy PowerPoint. Students who access the Learning Management System (LMS) will be more prepared to learn in class because students have been equipped with knowledge and understanding related to financial literacy, so when students was in class and given cases, students can discuss, debate, and work on cases given by lecturers very well, thus students' abilities in terms of application, analysis, evaluation, and creating increase well. If students are not able to master the financial literacy material in class, students can access the Learning Management System (LMS) and review the feedback given by the lecturer outside the classroom.

The results of the current research confirm previous research conducted by previous researchers who concluded that flipped classrooms can improve financial literacy (Kapil, 2019). In addition, the results of the current research also have similar research results with previous studies, namely flipped classroom can improve the classroom atmosphere to be more active, the flipped classroom can increase students' critical thinking power, this happens in class when students discuss with lecturers using quality questions and student motivation increases because students are comfortable learning with flipped classroom (Cuetos, 2023; Ishartono et al., 2022; Santos & Serpa, 2020).

Project-based learning has a positive and significant effect on financial literacy because project-based learning can improve financial literacy by giving students direct experience in solving financial literacy cases given by lecturers. In addition, students who are less able to understand financial literacy can work together with other students to be able to solve cases given by lecturers, so project-based learning can improve teamwork. Project-based learning also encourages students to be able to think critically when students face financial literacy cases that require the application of knowledge in solving cases given by lecturers. When associated with the results of previous research, the results of the current research have the same research results, namely project-based learning is proven to be able to improve understanding, critical thinking skills, and student activeness in class (Deng, 2022; Lu & Yan, 2023; Martinez & Andújar, 2020; Young & Legister, 2018).

The financial literacy of students taught with flipped classrooms is higher than the financial literacy of students taught with project-based learning. This is because a flipped classroom in terms of learning preparation is much better than project-based learning. Students before entering the class can already access Google Classroom which contains learning materials, learning videos,

financial literacy handouts, and teaching materials related to financial literacy. Unlike students who research with project-based learning, project-based learning students do not get learning materials before the learning begins. Thus, the preparation of lecturers and students in flipped classrooms is better than project-based learning.

In addition, the quality of learning in the flipped classroom is higher than in project-based learning, this is because students who learn in a flipped classroom have minimally fulfilled low-order thinking skills in the form of knowledge, understanding, and application so that learning can be continued to high order thinking skills in the form of analysis, evaluation and creating investment portfolios.

In contrast to students who learn with project-based learning, students have not received financial knowledge before learning begins, so some students when given project assignments are still trying to understand the concept of financial literacy, so sometimes students need a lot of time to complete the project given by the lecturer. Thus, a flipped classroom can trigger a high-quality learning atmosphere, efficient and effective in achieving learning objectives than project-based learning. When viewed from the learning approach, the flipped classroom is better than project-based learning because the flipped classroom is learning that involves the role of lecturers and students to be active in learning, while project-based learning is more student-centered learning, so the role of lecturers is only as a facilitator. When examined from the learning time, the flipped classroom is better than project-based learning because a flipped classroom uses a learning management system, so that when learning has ended in the classroom, students can still access learning materials at home, while students who research with project-based learning must pay more attention to learning in the classroom because students only have the opportunity to learn deeply in the classroom, unlike flipped classroom which uses a learning management system (LMS).

Researchers in this research have tried as carefully as possible to apply flipped classroom and project-based learning in financial literacy learning. However, this research is not free from some weaknesses. First, this research used university students, so the results may not be applicable to elementary or secondary school students, or the general public, because the sample consists of students from the Faculty of Economics and Business, who already have a basic understanding of financial concepts. Second, due to time constraints, the researchers were unable to categorize students based on their level of financial knowledge, so this research could not determine which teaching model is suitable for different levels of financial knowledge among students.

4. Conclusion

The current research highlights the major advantages of the flipped classroom model over project-based learning for improving students' financial literacy. The flipped classroom approach enables students to access learning materials such as videos, documents, and presentations before to class, ensuring that they are prepared for more engaging and productive discussions and learning. While project-based learning encourages cooperation and practical problem solving, it sometimes lacks the preparatory framework that the flipped classroom provides. Students study with project-based learning may struggle to grasp key financial concepts before beginning tasks, which might limit their development and impede their overall knowledge. Overall, the flipped classroom model emerges as a superior means of promoting financial literacy, offering a more structured and effective learning experience that prepares students with the skills they need to succeed. The implication of this research is that the flipped classroom is highly suitable for beginner to advanced students at the university level, while project-based learning is more appropriate for students who already possess sufficient knowledge to complete projects.

5. Suggestions

There are two recommendations for future research. First, researchers should consider using a more diverse sample that includes elementary and secondary school students, as well as members of the general public, to improve the generalizability of the results. Second, future studies could employ a factorial design to investigate the effects of flipped classrooms and project-based learning while taking into account students' financial knowledge. This could involve categorizing students

into three levels: high, medium, and low, to identify which teaching model best aligns with their financial knowledge.

6. Co-Author Contribution

All authors confirm no conflict of interest in this research article. Anggono, the first author, developed the research idea, performed statistical analysis, and wrote the article. Rini Herliani, the second author, designed a learning management system (LMS) for flipped classrooms and conducted experiments. Siti Aisyah Nasution, the third author, created the research instrument and carried out experiments. Sauh Hwee Teng, the fourth author, provided financial literacy teaching materials and supervised the experiments. Noppakao Naphatthalung, the fifth author, contributed knowledge on integrating flipped classroom and project-based learning into the financial literacy curriculum. All authors approved the final version of the manuscript.

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