# THE EFFECT OF PADLET-ASSISTED FLIPPED CLASSROOM LEARNING MODEL ON CRITICAL THINKING ABILITY

Abstract :
The aim of this research is to compare the flipped classroom learning model assisted by Padlet and the blended learning model on critical thinking skills. The problem that will be studied is whether there are differences in the two dimensions of the learning model regarding critical thinking abilities. In this study, the independent variable (X) is the flipped classroom learning model assisted by Padlet. Meanwhile, the dependent variable (Y) is critical thinking. The research sample was taken from students at SMA Muhammadiyah 1 Surabaya. The research sample was taken from students who were normally distributed, had the same characteristics (homogeneous), and had the same average value. Then two groups (classes) were taken as samplestwo experimental group classes used a flipped class learning model assisted by padlet and two control group classes used a blended learning model. The data analysis technique used is the independent sample T-test statistical analysis technique.With a significance level of 0.05. The resulting Sig value is known. (2-tailed) of 0.025. The results show that there are differences in critical thinking abilities between the flipped classroom learning model, assisted by Padlet, and the blended learning model.

*Keywords: Learning model; flipped classroom;padlet; critical thinking*

## 1. Introduction

“Changes in learning paradigms in the digital era have had a significant impact on the world of education. Technological advances help streamline and lighten teachers' workload, from platforms that allow sharing of resources to learning tools. Professional educators, serving as facilitators of learning, need to harness their creativity to fully utilize available learning resources and media, ensuring effective teaching. To excel in their role, educators must acquire the necessary knowledge and skills to design and create learning materials effectively.

One way of teaching that can be used with students is through the flipped classroom concept. The flipped classroom is a learning method that allows students' active participation and involves them directly in the learning process, The combination of various types of learning designs and delivery of material through various media such as video, audio, images and documents in PDF, DOC and so on, is the essence of the "flipped classroom" learning model. This learning model was developed by Jonathan Bergman and Aaron Sams in 2007 with the aim of providing learning materials to high school students outside the classroom who were unable to attend live instruction”[1].Emphasizing the central role of students to encourage greater student participation in the learning process is one of the key components of the flipped classroom learning approach. The five stages of the flipped classroom paradigm are as follows: before class begins, at the start of class, during class, after class, and consultation time. Students use a pre-established learning management system to learn outside of the classroom, and they use a range of hands-on activities in the classroom to participate in active learning activities.

The flipped classroom is an educational method that begins the process with independent learning outside the classroom, followed by discussions about the material learned while in the classroom[2].The main goal of the flipped classroom is to give students the opportunity to receive online learning before entering class, so that they have additional time to prepare the material. The feedback given by teachers to students is intended to clarify and correct any wrong understanding that students may experience[2]. The significance of learning activities lies in their suitability to students' individual learning styles.

The flipped classroom learning model is proposed as a solution to improve critical thinking skills in the context of 21st century education. Basically, the flipped classroom approach

involves students in understanding material outside of class, while in class they apply the knowledge they have gained by solving problems.
The flipped classroom learning model involves providing reading material and assignments to students outside of class. While in class, students are involved in discussions and solve the problems given. The class atmosphere becomes more dynamic with students actively interacting with each other and the teacher when completing the exercises given. These findings are in line with the results of research conducted by Elmaadaway[3]Through the flipped classroom approach, students learn the material beforehand at home, enabling them to engage in relevant activities, ask questions, and participate in problem-solving during class.According to Bergfjord and T. Heggernes[4]in the flipped classroom model, students have better preparation for lessons in class, feel more satisfied, and achieve better learning outcomes. Thus, this learning approach has a positive impact on students' knowledge, skills and engagement[5]. Chiang[6]also supports his findings that project-based flipped classroom learning is effectively utilized in education.
In the flipped classroom learning model, it cannot be separated from the use of learning media, namely the Padlet application. The use of padlet media can help the learning process between teachers and students to obtain the desired goals in obtaining learning outcomes. Everything helps students to understand lessons that are easy to remember so there is an interactive model with students. From the Padlet application, teachers can use it as teaching material or learning media to increase student motivation and learning outcomes. Padlet media is very interesting and can be adjusted according to the available platforms. From its definition, more precisely Padlet can be illustrated as a virtual board which is created by teachers or students as a learning medium. [1].
The purpose of this research is to compare learning using a padlet-based blended learning type flipped classroom learning model and an LMS-based blended learning learning model on critical thinking skills.

### 1.1. Critical Thinking

Thinking is the capacity to evaluate, assess, and draw well-founded judgments. For the following reasons, Mazano [7] highlights the need of having a framework when learning to think: Thinking is necessary for five reasons: 1) to establish attitudes and perceptions that promote the development of a positive learning environment in the classroom; 2) to acquire and integrate knowledge; 3) to broaden one's knowledge horizons; 4) to give knowledge meaning; and 5) to foster the development of practical thinking skills.

Critical thinking is the ability to carefully and actively interpret and evaluate observations, communications, information, and arguments [8]. “Critical thinking is an evaluative process that involves assessing the benefits, quality, price, or value of something. In general, critical thinking focuses on evaluating the truth, plausibility, or reliability of a claim”. [12]

Edward Glaser[8], author of the book Watson-Glaser Critical Thinking Appraisal (a test of critical thinking skills that is widely used globally), provides the following definition of critical thinking: 1) An attitude of wanting to consider in depth problems and topics related to experience somebody. 2) Knowledge of evaluation techniques and logical reasoning. 3) Ability to apply these techniques. Critical thinking emphasizes hard efforts to explore every assumptional belief or knowledge based on supporting evidence and subsequent consequences..

## 2. Method

This research adopts a quantitative approach and, based on its classification, is included in the type of experimental research. More specifically, this research uses an experimental approach with a quasi-experimental type. In a quasi-experiment, the division of research groups is carried out non-randomly. According to Sugiyono[7], this type of quasi-experiment involves a control group, but is unable to fully control the external variables that influence the course of the experiment.

In this research, there are two main types of variables, namely independent variables and dependent variables. The explanation of each variable is as follows:

1. Independent variable

Sugiyono[7]stated that independent variables are factors that influence or trigger changes or the emergence of dependent variables. This independent variable can be a treatment condition or a controlled variable[8].In the context of this research, the independent variable is the application of the Padlet-based flipped classroom learning model.

2. Dependent variable

Dependent variables are variables that are influenced or arise as a result of the existence of an independent variable[7]. The dependent variable in this research is critical thinking ability.

The conceptual relationship between variables in this study is illustrated in the following figure:

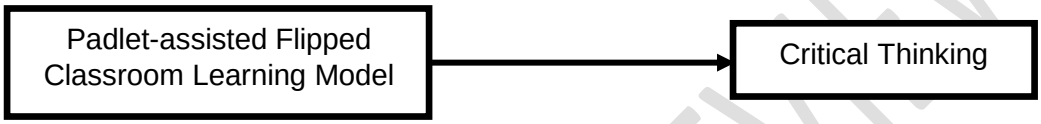


**Figure 1.Relationships Between Variables in Research**

In this study, the independent variable (X) is the flipped classroom learning model assisted by Padlet (X). Meanwhile, the dependent variable (Y) is critical thinking (Y). The following is the operational definition of each variable:

1. The flipped classroom learning model assisted by Padlet (X), is a learning model that presents the latest learning process by providing online material outside of class and doing assignments in class.
2. Critical thinking (Y), is an intellectual ability to create concepts, apply, analyze, synthesize and evaluate obtained from the results of observation, experience, reflection, where the results of this process are then decided and implemented. It can be defined that critical thinking has two steps, namely : 1) do rational thinking (reasoning), 2) make decisions or solve problems (problem solving) quickly.

**Table 1. Critical Thinking Ability Indicators**

| Variable | Indicators | Descriptor |
|---|---|---|
| **Critical Thinking** | 1. Interpretation | • Grouping facts or logical conclusions or statements.<br>• Make meaning.<br>• Meaning is clear. |
| | 2. Analysis | • Testing ideas.<br>• Recognize arguments.<br>• Recognize reasons and statements. |
| | 3. Evaluation | • Distinguish between strong and relevant arguments.<br>• Assess the quality of arguments made using inductive or deductive reasoning. |
| | 4. Inference | • Assess the quality of the question.<br>• Draw a conclusion. |
| | 5. Explanation | • State the results.<br>• Support procedures.<br>• Present arguments. |
| | 6. Self-regulation | • Self-monitoring<br>• Self-improvement |

Adapted from Facione [13]

A total of 120 students from SMA Muhammadiyah 1 Surabaya were selected as research samples. The sample was selected from students who had a normal, homogeneous distribution and

had a uniform average value. Next, two groups of students were taken as samples, namely the experimental group and the control group.The independent variable research sample consisted of 2 classes, class A had 28 students and class B had 32 students. The dependent variable research sample consists of 2 classes, class A has 30 students and class B has 30 students.

"The data analysis technique used to evaluate the effect of the flipped classroom learning model on critical thinking skills is to use the Independent Sample T-test statistical test. The Independent Sample T-test is a parametric statistical method used to determine whether there is a difference in means between two independent groups or two unpaired groups, with the aim of ensuring that the data from the two groups come from different subjects. Decisions based on Independent Sample T-test analysis are taken by comparing the t-value with the critical t-value, in accordance with predetermined criteria".[12]

## 3. Results and Discussion

Based on the results of statistical tests, results were obtained which will be explained in the following sub-chapter.

### 3.1. Tests of Normality

Data normality checks were carried out on the critical thinking ability data that had been collected. The purpose of checking normality is to determine whether the distribution of the data obtained is normal or not, and to ensure that the conditions for hypothesis testing are met.

**Table 2 : Tests of Normality**

| | Model Pembelajaran (X1) | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|---|
| | | Statistic | df | Sig. | Statistic | df | Sig. |
| Berpikirkritis (Y) | Flipped Classroom berbasis*Padlet* | .093 | 60 | .200* | .962 | 62 | .051 |
| | Blended learning | .102 | 50 | .200* | .968 | 58 | .127 |

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

From the results of the normality test table presented above, it can be seen that the significance value for the control class and experimental class is greater than 0.05, so the conclusion is that H0 is accepted. This indicates that the data is normally distributed.

### 3.2. Independent Samples Test

After testing the prerequisite analysis, hypothesis testing is then carried out. The following are the results of the independent sample t-test.

**Table 3 : Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| Berpikirkritis (Y1) | Equal variances assumed | .817 | .368 | .668 | 118 | .025 | 1.289 | 1.930 | -2.532 | 5.111 |
| | Equal variances not assumed | | | .666 | 114.835 | .027 | 1.289 | 1.936 | -2.546 | 5.125 |

Based on the output above, it is known that the value of Sig. Levene's Test for Equality of Variances is 0.368 > 0.05, which means that the variance of the data between groups is homogeneous or equal. Thus, the interpretation of the Independent Sample T-test table above is based on the values found in the "Equal variances assumed" table.

Based on the output table "Independent Samples Test" in the "Equal variances assumed" section, the value of Sig. (2-tailed) is 0.025 < 0.05. Therefore, according to the decision-making basis in the independent sample t-test, it can be concluded that H0 is rejected and Ha is accepted.

Furthermore, from the output table above, the value of "Mean Difference" is 1.289, indicating the difference between the average critical thinking abilities of students in the control and

experimental groups. “The difference range is -2.532 to 5.111 (95% Confidence Interval of the Difference Lower Upper)”.[12]

**Padlet-Assisted Flipped Classroom Learning Model to Improve Critical Thinking Ability**

“According to the results of the hypothesis analysis, there is a significant difference in critical thinking abilities between classes that apply the flipped classroom learning model with the help of Padlet and classes that apply the LMS-based blended learning model as a control”. Jian[9],Lin[10]and Chis[2].

Students' critical thinking abilities have been found to improve with the implementation of the flipped classroom learning paradigm. This is demonstrated by the fact that test scores for critical thinking skills both before and after the Flipped Classroom learning paradigm were significantly higher. Using the Flipped Classroom learning paradigm implies that there will be interaction amongst students, teachers, and the learning environment with the goal of changing students' behavior. Changes that were previously thought to be impossible, like going from ignorance to knowledge, can happen thanks to this process. Thus, in order to accomplish the goals of the Flipped Classroom learning model, teachers can engage with students more deeply and provide a variety of learning environments and scenarios both at home and in the classroom.

Flipped classroom, a very well-known learning model, changes the conventional way of learning. Flipped classroom learning begins with students studying material online outside of class or at home using previously prepared content. After completing online learning outside of school, students then continue to study the material and practice problem solving in class with teachers or peers. With this approach, the traditional role of learning in the classroom becomes "reversed". However, in principle this learning still maintains the conventional learning structure, but is applied in a new context..

Using the flipped class method further increases students' understanding of the learning material. The application of Padlet provides greater opportunities for students to study learning material repeatedly. Students can use the Padlet application to learn material whenever and wherever they are[11].In online distance learning, students have greater freedom in expressing opinions or asking questions because there is no physical interaction with other students. Through online discussions using Padlet, students are given the freedom to voice their opinions. Students seem more comfortable in asking questions and expressing opinions using everyday language

## 4. Conclusion

From the data analysis carried out, it can be concluded that there are differences in critical thinking abilities resulting from the use of the Padlet-assisted flipped classroom learning model compared to the control class which uses the LMS-based blended learning model.Active student involvement in implementing learning using the flipped classroom assisted by Padlet makes students more independent. The flipped classroom learning model can be combined with other applications for alternative solutions for implementing online learning.

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