THE IMPACT OF FLIPPED CLASSROOM EDMODO-BASED LEARNING MODEL TOWARDS STUDENTS' CRITICAL THINKING SKILL

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Abstract

This study aims to compare the models of blended learning flipped classroom based on Edmodo and the LMS-based on students' critical thinking skills. The problem arised is to find whether there are differences in the dimensions of the two learning models on students' critical thinking skills. The independent variable (X) in this study is a blended learning type flipped classroom based on Edmodo (X1). While the dependent variable (Y) is the critical thinking. The research sample was taken from the third semester students who were normally distributed, had the same characteristics (homogeneous), and had the same average value. Then two groups (classes) of students were taken as samples, named the experimental group and the control group. The data analysis technique used to determine the difference between the blended learning model type flipped classroom on students' critical thinking skills is the Independent Sample T-test statistical analysis technique. The results showed that there were differences in critical thinking skills between the Edmodo-based blended learning type flipped classroom learning model and the LMS-based blended learning model.

Keywords: *flipped classroom model, edmodo, critical thinking*

1. Introduction

Understanding and utilization of Information and Communication Technology is the main skill that must be possessed by the 21st century community or knowledge society. According to Trilling and Fadel (2009:49) in their book entitled 21st Century Skills Learning for Life in our Times, the focused skill of 21st century is critical and innovative learning skills, namely critical thinking and problem solving, communication and collaboration, creativity and innovation.

The lecturer's paradigm towards the learning process is changed so that the objectives and learning outcomes can be achieved properly. According to Snyder and Snyder (2008), learning in general is still oriented to the process of memorizing and knowing, so it has not been able to practice life skills especially higher-order thinking skills. Based on the opinion of Johnson (2010: 100), critical thinking is a mental activity in the form of clear and organized activities such as problem solving, making decisions, analyzing various people's views, and scientific findings obtained.

One of the recommendations for the 2019 Kemenristekdikti National Working Meeting is Online Learning in Higher Education by referring to the Minister of Research, Technology and Higher Education Regulation No. 51/2018 to be held as a higher education strategy to answer the challenges of the industrial revolution. As it is known that the Directorate General of Higher Education has launched an online learning program called the Indonesian Online Learning System (SPADA) which is participated by all universities throughout Indonesia. Generally, blended learning models are web technology-based learning using a very open learning environment that can be accessed via internet to facilitate learning and construct student knowledge through meaningful interactions.

The blended learning model that can be applied to teach students is the flipped classroom. The flipped classroom learning model is active learning that combines the involvement of students, a combination of various learning designs and the distribution of learning materials in a prodcast (video, sound, image or document in the form of pdf, doc, etc.). The “flipped classroom” instructional model was developed by Jonathan Bergman and Aaron Sams in 2007 to provide instruction to secondary students who were missing class and therefore missing instruction (Bergmann & Sams, 2012). One of the main pillars of the flipped classroom learning model is a learner-centered learning model, so that students are more actively involved in the formation of their knowledge. The flipped classroom model is simply divided into 5 stages, namely before class, beginning of class, during class, after class, and officials hour. When outside the classroom students learn through a predetermined learning management system, while in the classroom students learn actively through real activities in class.

Flipped classroom is a pedagogical approach which in its implementation departs from individual learning that can be done outside the classroom, then the learning outcomes are discussed in class (Chis et al., 2018). The main purpose of the flipped classroom is that with online instruction before class, it will give students free time to prepare more questions. The feedback given by lecturers to students is to straighten and clarify misconceptions experienced by students (Chis et al., 2018). Learning activities will be meaningful when students learn with their own learning style.

In the flipped classroom learning model, the role of the lecturer is only as a facilitator. Through the flipped classroom learning model, students are able to train students' independent learning because students can look for other learning resources besides videos and materials provided by students (Chang et al., 2018).

The flipped classroom learning model is one of the efforts to provide solutions to critical thinking problems that can be applied in dealing with 21st century education. Basically, the concept of the flipped classroom learning model is that students at home do what they do in class, namely learning by understanding the material that has been given by the lecturer, and

in class students do what students usually do at home, namely doing questions and solving problems (Bergmann and Sams, 2012).

The use of Edmodo as a medium in the flipped classroom model is an alternative learning to improve students' critical thinking skills (Kustandi, 2017). The use of Edmodo facilitates and improves effective learning communication and can save time (Wahyuni et al., 2019)

Flipped classroom learning is done by providing the required literature materials and assignments to students. In class, students conduct discussions and do the problem solving activity. The class becomes more lively where students actively communicate between friends and lecturers when completing the given exercises. In line with the results of research (Elmaadaway, 2018) that through the flipped classroom approach, students learn the material first at home, so that the class participates in relevant activities, asks questions and is involved in problem solving. Bergfjord & Heggernes (2016) state that in a flipped classroom, students prepare better for classroom learning, feel satisfied and achieve better learning outcomes. So, the learning has a positive effect on the knowledge, skills, and involvement of students (Murillo-Zamorano et al., 2019). In addition, Chiang (2017) also supports the results of this study that project-based flipped classroom learning is effectively used in learning.

The purpose of this study is to compare the learning model with blended learning typeflipped classroom based on Edmodo and blended learning model based on LMS on critical thinking skills.

2. Theory

2.1 *Flipped Classroom Learning Model*

Flipped classroom is a learning model that presents the latest learning process by providing online material outside the classroom and doing assignments in the classroom. Students are given online learning videos and presentations that can be accessed through the Edmodo application. Learning videos are used as the main learning media from the flipped classroom learning model by posting videos to online portals that are used as media by lecturers.

According to Bergmann & Sams (2012), the flipped classroom learning model is an active learning model that combines students' activities, integrates various learning methods, and disseminates learning resources in a prodcast (video, sound, image, or document in the form of pdf, doc, and others). -other).

The flipped classroom learning model conveys learning material usually online outside the classroom and makes learning activities that are usually done as homework into learning activities in the classroom. In the flipped classroom learning model, students watch videos of learning or read ebooks sent via the Edmodo application at home to find their own concept of the subject matter at their own pace. Inside the classroom, students already have a concept about the material to be studied so that they are better prepared to accept lessons and have more time to do assignments, practice questions, projects, or discuss material that has been delivered by the lecturer.

According to Bergmann & Sams (2012), the steps are as follows:

a. Lecturer prepares and provides videos of learning activity and ebooks studied by students at home.

b. Students watch the videos and read ebooks and learn the instructions given by the lecturer through the videos and ebooks so that they are familiar with the concepts and materials that will be given at the next meeting.

c. Lecturer and students have a short discussion about the videos and ebooks that have been studied.

d. Lecturer gives class assignments, discussions, or tests as is usually done in the traditional model.

e. Lecturer acts as tutor to establish an effective interactive communication.

2.2 Edmodo

Utilization of technology is an important thing in the blended learning type flipped classroom. The appropriate application used is Edmodo since it can can be implemented using both synchronous and asynchronous to send the materials.

Edmodo is a school-based social network developed by Nicolas Borg and Jeff O'Hara completed with features that support the teaching and learning process. Edmodo can be accessed freely at www.edmodo.com by lecturers, students, and parents.

According to Basori (2013), Edmodo is a free open source that tries to keep pace with the development of Facebook. The only difference is that it is used mostly in the world of education. So that the existing features support integrated learning management.

In the Edmodo application, both students and lecturer are required to register and have a login account to facilitate checking the identity of using the application. In general, users who want to enter the system must have an account login first by entering a username and password.

For lecturer, she or he must first creates an account by visiting www.edmodo.com then selecting the "I'm a Teacher" button to create a new account as a teacher. After that, create a class with the Group feature that can only be accessed through certain Group Codes. Group Code is unique and is automatically generated by Edmodo system. Group Code is like a password to join the class. The lecturer manually informs the Group Code to students before taking the class.

According to Basori (2013), Edmodo features are adapted to learning needs. It classifies its features based on users, namely lecturers and students. Below are the features available on Edmodo:

1. *Assignment*

Assignment is used by lecturers to give assignments to students online. This feature is equipped with a deadline time and file attach feature so that students can send assignments in the form of files directly to the lecturers. In addition, assignment submissions also have a "Turn in" button which indicates that the student has completed the assignment.

2. *File and Links*

In this feature, lecturers and students can send messages by attaching files and links to class groups, students or other lecturers. Attached files apply to all types of extensions like doc, pdf, ppt, xls, and others.

3. *Quiz*

Quiz is used to provide online evaluations in the form of multiple choice, short entry, and description questions. Quiz can only be made by lecturers, while students only do it. This feature is equipped with a time limit for processing, information about the quiz to be made, quiz title, and quiz display.

4. *Polling*

Polls can only be created by lecturers to be distributed to students. Usually, lecturers use polls to find out student responses about certain things related to the lesson.

5. *Gradebook*

The gradebook feature is used as a record of student grades. The scoring can be done by the lecturer and can be filled manually or automatically. Automatic filling grades can only be done based on the results of the assignment and quiz scores. Assessments on gradebooks can be exported into a.csv file.

6. *Library*
This feature is used as a repository for various learning resources with diverse content. This feature helps lecturers to upload teaching materials, presentations, reference sources, images, videos, audio, and other digital contents. Links and files contained in the library can be shared both with students and groups. Students can also add content shared by lecturers to the library.
7. *Award Badges*
This feature is used to give an award to both students and groups. The award can be determined by the lecturer himself so that it does not hinder the creativity of the lecturer in giving the award.

2.3 Critical Thinking

Thinking is the ability to analyze, criticize, and reach conclusions based on good inference and judgment. According to Mazano (2005), the importance of a framework on learning to think for a person are needed to: 1) develop attitudes and perceptions that support the creation of positive classroom conditions, 2) acquire and integrate knowledge, 3) broaden knowledge horizons. , 4) actualize the meaning of knowledge, 5) develop favorable thinking behavior

Critical thinking is skilled and active interpretation and evaluation of observation and communication, information and argumentation (Fisher, 2014). Critical thinking is defined as evaluation because it is the process of determining the benefits, quality, price or value of something and critical thinking generally deals with evaluating the truth, probability or reliability of claims.

The definition of critical thinking was put forward by Edward Glaser (Fisher, 2014), one of the authors of the Watson-Glaser Critical Thinking Appraisal (the most widely used test of critical thinking skills in the worldwide). Glaser defines critical thinking as follows: 1) An attitude of wanting to think deeply about problems and things that are within the reach of one's experience. 2) Knowledge of examination methods and logical reasoning. 3) A skill to apply these methods. Critical thinking demands a great effort to examine every belief or assumptive knowledge based on the supporting evidence and the further conclusions that result from it.

Table 1 Critical Thinking Skill Indicators

Variable	Indicators	Descriptors
Critical Thinking	1. Interpretation	• Categorize facts or conclusions or logical statements. • Decode significance. • Clarify meaning.
	2. Analysis	• Examine ideas. • Identify arguments. • Identify reasons and claims.
	3. Evaluation	• Assess credibility of claims. • Assess quality of arguments that were made by inductive or deductive reasoning.
	4. Inference	• Query the evidence. • Conjecture alternatives. • Draw conclusion using inductive or deductive reasoning.
	5. Explanation	• State results. • Justify procedures. • Present arguments.
	6. Self Regulation	• Self-monitor • Self-correct

(Adapted from Facione, 2013)

3. Method

This research uses a quantitative approach and based on its classification. This type of research is included in the type of experimental research. This study uses experimental research with a quasi-experimental type of research. A quasi-experimental divides the research group non-randomly. According to Sugiyono (2009), this type of quasi-experimental research has a control group but cannot function fully to control external variables that affect the implementation of the experiment.

The variables in this study consisted of independent variables and dependent variables. The explanation of each variable is as follows

1. Independent Variable

According to Sugiyono (2009), the independent variable is a variable that affects or is the cause of changes or the emergence of the dependent variable (bound). The independent variable is the state of the treatment or the controlled variable (Turmudi & Hartini, 2008). The independent variable in this study is the Edmodo-based blended learning type flipped classroom.

2. Dependent Variable

The dependent variable is a variable that is influenced or is the result of the independent variable (Sugiyono, 2009). Meanwhile, according to Janah (2016: 34), the dependent variable is a variable that is measured in an experiment to see if there is a change after the independent variable is given. The dependent variable in this study is the ability to think critically.

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

Figure 1. Relationship between variables

In this study the independent variable (X) is a blended learning type flipped classroom based on Edmodo (X). While the dependent variable (Y) is critical thinking (Y). The following is the operational definition of each variable:

1. The blended learning typeflipped classroom based on Edmodo (X), is a learning model that presents the latest learning process by providing online materials outside the classroom and doing their assignments in the classroom.
2. Critical thinking (Y), is an intellectual ability to conceptualize, apply, analyze, synthesize, and evaluate the results obtained from observation, experience, reflection. Then the results of this process come with the decision and implementation that critical thinking has two steps. They are: 1) doing logical thinking (reasoning), 2) making decisions or solving problems (problem solving) quickly.

The research sample was taken from the third semester Islamic Education (PAI) students as many as 120 students. 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) of students were taken as samples, named the experimental group and the control group

The data analysis technique used to determine the effect of the blended learning type flipped classroom on critical thinking skills is the Independent Sample T-test statistical analysis technique. Independent sample t-test is a parametric test used to determine whether there is a difference in the mean between two independent groups or two unpaired groups with the intention that the two groups of data come from different subjects. Decision making based on the analysis of the Independent Sample T-test is done by comparing the value of t_{count} with t_{table}.

4. Results and Discussion

5.1. Results

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

1) Normality Test of the Data

The normality test of the data was carried out on the critical thinking skill data that had been obtained. The normality test is carried out to determine whether the distribution of the data obtained is normally distributed or not and also to meet the requirements of the hypothesis test to be carried out.

Tabel 5. Tests of Normality

	Learning Model (X1)	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Critical Thinking (Y1)	Flipped Classroom Edmodo-based	.093	62	.200*	.962	62	.051
	Blended learning LMS-based	.102	58	.200*	.968	58	.127

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

Based on the normality test table above, the control class and the experimental class have a significance value of more than 0.05. So that it can be said that H0 is accepted. This shows that the data is normally distributed.

2) Independent Sample T-Test

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

Tabel 6. 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
Critical thinking (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 data variance between groups is

homogeneous or the same. So that the interpretation of the Independent Sample T-test table above is guided by the values contained in the table of "Equal variances assumed".

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

Furthermore, from the output table above, it is known that the "Mean Difference" value is 1.289. The value shows the difference between the average thinking ability of students in the control and experimental groups. The difference between these differences is -2,532 to 5,111 (95% Confidence Interval of the Difference Lower Upper).

5.2. Discussion

Based on the results of hypothesis test, there is a significant difference in critical thinking skills between the experimental class taught using the Edmodo-based blended learning type flipped classroom and the control class taught using the LMS-based blended learning model. The results of this study are in line with research conducted by Jian (2019), Lin (2019) and Chis et al., (2018).

The implementation of the flipped classroom learning model is effectively used to improve students' critical thinking skills. This is indicated by the significant increase in critical thinking ability test results before and after the implementation of the Flipped Classroom learning model. The implication is that in the implementation of the Flipped Classroom learning model in the learning process, there is a process of interaction between students and lecturers and the learning environment that aims to produce a change in behavior. Students who were not able became able in the last. Ones who previously did not know became know. So that during the implementation of Flipped Classroom learning model, lecturers are able to be more interactive with students and are able to create various conditions and situations in learning both at home and in the classroom in order to produce changes that are in accordance with the objectives, both learning outcomes and thinking skills (cognitive, affective, and psychomotor).

The flipped classroom learning model is the most widely known learning model. Flipped classroom starts from student learning which is done online outside the classroom or at home with previously provided contents. After carrying out the online learning process outside school students then deepen and practice solving problems at school with lecturer or peers. Thus, it can be considered the role of traditional learning in the classroom to be "reverse". Basically, this learning still maintains the traditional learning format but is carried out in a new context.

In online distance learning activities, students will be more flexible or free to express opinions or ask questions because there are no other students who physically observe them. Online discussions through Edmodo give students the freedom to express their opinions. Students seem free to ask questions and express opinions using their everyday language.

5. Conclusion

Based on the results of data analysis, it can be concluded that there are significant differences on students' critical thinking skills between the experimental class taught using the flipped classroom blended learning model Edmodo-based and the control class taught using LMS-based.

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