

Flipped classroom model integrated with the online learning platform and video biomechanic analysis to enhance learning outcome of Pencak silat during the Covid-19 pandemic

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Abstract: Online learning during the pandemic of Covid-19 affects the learning process in higher education. This research aimed at investigating the efficacy of flipped classroom model integrated with the online learning platform (by zoom meeting) and video biomechanics analysis to enhance the learning outcome of Pencak silat during the Covid-19 pandemic in 2020. The video with biomechanic analysis of Pencak silat was made using the Kinova application which aims to make it easier for students to learn the movements of a single artistic empty-handed category of Pencak silat. The main element of assessment is the correctness of movement, therefore students must memorize the moves and sequences correctly. This research method was experimental one group of pre-test and post-test design. The subjects involved in this research were 38 physical education students (age: M=20.11, SD=0.39; gender: 35 male and 3 female) of Universitas Islam 45 Bekasi, Indonesia. The data obtained were analyzed using the t-test. The results of the analysis show that the flipped classroom model integrated with the online learning platform influence the enhancement learning outcome of Pencak silat there was a significant ($P \leq 0.05$). In addition, flipped classroom integrated with an online learning platform and video biomechanic analysis is the right formula to increase learning outcomes in Pencak silat.

Keywords: flipped classroom, pencak silat, learning outcome, single artistic, covid-19

1. Introduction

During the Covid-19 pandemic, lecturers are required to design online learning while still paying attention to learning outcomes. Learning design includes preparation, implementation, and evaluation. Lecturers must be able to choose the right learning model, be creative in making interesting teaching materials, and design effective evaluations during online learning to deliver training to a large number of people, while taking into account their particular needs, expectations,

and context (Velicanu, Lungu, Diaconita, & Nisioiu, 2013).

One of the learning models suitable to be applied during the Covid-19 pandemic is a flipped classroom (Khan & Abdou, 2020; Safytri, 2020; Sinatrya & Aji, 2020; S Suharno, 2020; Suharno Suharno, 2020; Yurniwati & Utomo, 2020). Flipped classrooms are a learning model that can be applied at the primary and secondary education (K12) and higher education levels (Gough, Dejong, Grundmeyer, & Baron, 2017; Milman, 2012), known as the inverted classroom concept. what is traditionally done in class will be done at home, and what is traditionally done

at home as homework will be done in class (Arnold-Garza, 2014; Bergmann & Sams, 2012; Herreid & Schiller, 2013; Milman, 2012; Wallace, 2014).

Flipped classroom according to Ozdamli & Asiksoy (2016), is an active, student-centered approach that is formed to improve the quality of the period in class. Baker (2000); Butt (2014); Mohanty & Parida (2016); Wallace (2014), the flipped classroom is a form of learning in which students learn the material through videos or other online learning tools in completing assignments and practices set during lesson time. Flipped classrooms help teachers work in allocating existing learning time efficiently in schools so that teachers can strengthen or focus on lesson topics or skills from the knowledge given to students in the classroom (Baker, 2000.; Mohanty & Parida, 2016; Trilaksono, Sasmokob, Tindas, Kartika, & Suroso, 2018). According to Bergmann & Sams (2012); Sams & Bergmann (2013), the flipped classroom model is a model that does not always use video in learning but about how to best use class time with students. The essence of the flipped classroom model is to move the learning that occurs in the classroom outside the classroom and prepare opportunities for students to be active in classroom learning (Bergmann & Sams, 2012).

During the Covid-19 pandemic changes in the learning Pencak silat course of higher education with instructional methods that embrace technology as a teaching online medium. These changes have led to the flipped classroom model where content is delivered outside class through media (video Pencak silat with biomechanical analysis) through problem-solving and/or group work occurs in a live class. Flipped learning a trending instructional model, reverses a traditional model of in-class lecture followed by practice and homework (Brewer & Movahedazarhouligh, 2018) in the physical education department, Universitas Islam 45, Indonesia.

Pencak silat is a sport of Indonesian cultural martial art which is preserved in formal and non-formal education, from elementary school to college. In the martial arts course, one of the skills that must be mastered is the empty-handed single artistic, which is one of the categories of martial arts competitions where a fighter demonstrates his skill in a single standard form correctly, accurately, and steadily, full of soul, with as many as 7 empty hands of jurus (50 movements) (Haqiyah, 2019; Lubis & Wardoyo, 2014).

The research on the learning outcomes of the single art Pencak silat style has been conducted by identifying physical and intelligence factors (Haqiyah, Mulyana, Widiastuti, & Riyadi, 2017). Currently what is needed is how to design practical learning in the covid-19 pandemic situation so that skills and competencies can be achieved. This study aims to determine how flipped classrooms and media assistance will be implemented during the Covid-19 pandemic in 2020. This research aimed at investigating the efficacy of flipped classroom model integrated with the online learning platform and video biomechanics analysis to enhance the learning outcome and improving the various abilities of learners in Pencak silat.

2. Method

Participant

The participant in this research based age and gender are:

Table 1. Participant based age and gender

		Gender		Total
		Male	Female	
Age	19	1	0	1
	20	31	1	32
	21	3	2	5
	Total	35	3	38

The participants are undergraduate students from the physical education majors at Universitas Islam 45 Bekasi, Indonesia. The class was taught by the combined model of the flipped classroom and live online teaching model a total of 38 students (age: $M=20.11$, $SD=0.39$; gender: 35 male and 3 female).

Treatment

Implementation of flipped classroom: students watch instructional videos pencak silat online before the live classes. Video pencak silat with biomechanic analysis made by kinovea software (Kinovea, 2014), it's application

for the analysis, comparison and evaluation of movement (Guzmán-Valdivia, Blanco-Ortega, Oliver-Salazar, & Carrera-Escobedo, 2013). Kinovea is useful for playing slow motion videos, and studying athletes' techniques.

3. Data collection and analysis

Data analysis used paired sample t-test with SPSS v25.0, confidence level $\alpha < 0.05$ (Muhamad, Memet; Hanif, Achmad Sofyan; Haqiyah, 2021).

The test procedures performed is measured learning outcome of pencak silat with test single art performance wich consists of 50 empty hand moves. The aspect of the assessment is the element of truth of motion.

4. Result and discussion

The results of the learning outcome student descriptively are as follows :

Table 2. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Post Test	41.5526	38	7.86954	1.27661
	Pre Test	17.7105	38	4.88189	.79195

It is known that descriptively, out of 38 students the post-test results were better than the pre-test results with a mean of 41.5526 while the pre-test results were 17.7105. The value of the increase is shown in the image below:

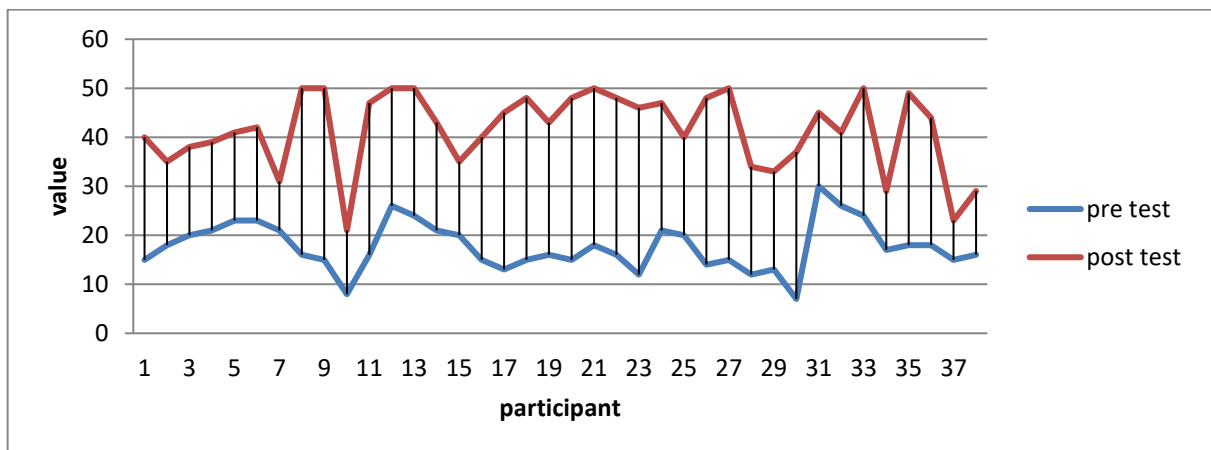


Figure 1. Learning outcome of pencak silat

To determine the level of significance, the t test was carried out, while the results were as follows :

Table 3. Paired Samples Test

Variable	Mean Difference	t	Sig	Remark
Learning outcome of pencak silat	23.84211	18.406	0.000	Significant

The results of the t-test indicate that the application of flipped classrooms and biomechanical analysis videos can improve the learning outcomes of pencak silat. It is known that the mean difference in the pre-test and post-test values is 23.84211. The flipped classroom is effectively applied during the Covid-19 pandemic in pencak silat learning with the support of good learning media. The examples of pencak silat videos based on biomechanical analysis are as follows:



Figure 2. Pencak silat video analysis

The video of Pencak silat with biomechanic analysis is made using the Kinova application which aims to make it easier for students to learn the movements of a single art category of Pencak silat. The main element of assessment is the correctness of movement, therefore students must memorize the moves and sequences correctly.

The learning media provided with the flipped classroom learning model is a formula designed during the Covid-19 pandemic to maximize the learning outcomes of Pencak silat, with the flipped classroom learning model, the capacity of learning activities in the classroom by maximizing interaction with one another namely teachers, students, and their environment. This flipped classroom learning model utilizes learning media that can be accessed online by students who are able to support the learning material (Maolidah, Ruhimat, & Dewi, 2017). The implementation of the flipped classroom model can be given or realized in various forms of learning media, one of which is by using interactive multimedia facilities, so that by implementing this model in learning it is hoped that student-oriented learning or better known as student center learning can be developed so that it can improve quality learning (Ozdamli & Asiksoy, 2016a).

One of the biggest advantages is that students have the option to watch each learning video as many times as needed to be prepared for class study (Mok, 2014), it allows students to access the content previously prepared by lecturers (Isidori, E., Chiva-Bartoll, O., Fazio, A., & Sandor, 2018). Flipped classrooms can increase student motivation in learning (Nouri, 2016; Østerlie, 2018) and are effectively used to improve critical thinking skills (Maolidah et al., 2017) and provide time to meet individual student needs (Blair, Maharaj, & Primus, 2016).

Milman (2012), classifies three types of knowledge that can be provided in learning with the model flipped classroom, namely: (1) factual, the knowledge that describes the basis and important elements that a person must have or know; (2) conceptual, knowledge of the relationship between classifications and categories; and (3) metacognitive, knowledge about knowledge itself.

The strategy flipped classroom has several advantages, namely (1) students learn according to their respective speed with the given material, (2) teachers can find out the difficulties and learning styles of students with students doing assignments or practice in class, (3) time learning in the classroom can be used more effectively, efficiently, and creatively, (4) learning becomes meaningful, (5) increasing skill development to a higher level, and (6) student performance can be improved (Arnold-Garza, 2014; Fulton, 2012; Mccarthy, 2016; Ozdamli & Asiksoy, 2016b; Trilaksono et al., 2018).

The strategy is flipped classroom that the teacher provides teaching materials for students to use for independent study at home before the next meeting. So students prepare more material before entering class while learning in class is strengthening and training (Ozdamli & Asiksoy, 2016b). The combined model of online teaching with flipped learning and media improved students' learning, attention, and evaluation of courses (Tang et al., 2020).

5. Conclusion

Flipped classroom integrated with an online learning platform and video biomechanic analysis is the right formula to increase learning outcomes in pencak silat during the Covid-19 pandemic. The combined model of online teaching with the flipped learning and video can improve students' learning. The implementation of the flipped classroom model can be given or realized in various forms of learning media facilities. The video of Pencak silat with biomechanic analysis is made using the Kinova application which aims to make it easier for students to learn the movements of a single empty-handed artistic category of Pencak silat. So, that by implementing this model in learning it is hoped that student-oriented learning or better known as student center learning can be developed so that it can improve quality learning.

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7. Declaration of competing interest

All author certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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