



The Effect of Hots-Based Blended Learning on Students' Critical Thinking Ability in Physical Education Learning

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Abstract

This study intends to investigate the impact of blended learning based on HOTS on the critical thinking skills of Physical Education students. This study's instrument is based on (Valenzuela et al., 2011), which consists of five components: 1) Wishful Thinking, 2) Project Value Achievement, 3) The Worth of Utility, 4) Task Inherent Worth, and 5) Fee. The employed research approach consisted of a controlled experiment with experimental and control groups. The experimental group was administered the blended learning model based on HOTS, whereas the control group was administered the conventional learning model. Using the paired sample t-test, the data analysis yielded a p-value of 0.000 0.05. Students' critical thinking skills increased by 87.16 percent as a result of the blended learning paradigm, according to the findings of the study. Therefore, the integrated learning paradigm based on HOTS efficiently trains students' critical thinking abilities in Physical Education.

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INTRODUCTION

The COVID-19 pandemic has had a massive impact on life's fabric, including education. Schools were forced to close to prevent the spread of COVID-19 (Ernalida et al., 2021). The impact of closing schools forces schools to adapt their learning by carrying out synchronous and asynchronous online learning (Xhelili et al., 2021). Due to the hurdles that arose due to the COVID-19 outbreak, online learning became the sole option for finishing the semester (Williyanto, 2020). So students and faculty can engage in their online courses any time of the day or night (Moskal et al., 2013). That is the best thing about distance education; we can learn anywhere and anytime (Basilaia, 2020). However, the obstacles students and teachers face in online learning are limited access to online learning support facilities and infrastructure, which has an impact on reducing the achievement of learning objectives in all subjects (Pajariantanto et al., 2020). In addition, government policies related to face-to-face learning are limited (Supriatna, 2021), which is also why teachers must find solutions to educational problems that occur at this time.

Obstacles in the implementation of the learning process compel teachers to think more strategically, particularly in accomplishing learning objectives. Combining online learning (web-based learning) and face-to-face learning (face-to-face learning) can be an effective learning approach, according to Fariska and Erman (2017). Blended learning is an English term that consists of two syllables, blended and learning, and refers to the combination of face-to-face and elearning (Bryan & Volchenkova, 2016). In a course that combines face-to-face instruction with an online platform, students and professors employ technology to facilitate active learning (Tayebnik & Puteh, 2013). In Blended Learning, numerous delivery channels, teaching approaches, and learning styles are combined to facilitate learning. It is predicated on open communication amongst all course participants (Heinze & Procter, 2004).

In the 21st century, substantial changes have occurred in all parts of life, including education (Saleh, 2019). Critical thinking is one of the 21st-century talents that students must possess (Seruni et al., 2020). It is difficult to define and, more significantly, to apply critical thinking (Fahim & Pezeshki, 2012). In addition to molding the morality of the nation's youth, one of the attributes that has recently become a focus of education is critical thinking. Critical

thinking enables pupils to think clearly, solve problems effectively, and make sensible decisions regarding what to do or believe (Susilawati et al., 2020). In physical education, critical thinking will help students to provide answers, pose questions, generate solutions, and address challenges they encounter while learning. One of the implementation goals for students' higher-order thinking skills is the development of critical thinking (HOTS).

High Order Thinking Skills is a degree of cognitive hierarchy in Bloom's taxonomy involving a higher order of thinking (Suprpto et al., 2017). This notion was established using the problem-solving approach, Bloom's taxonomy, and the typologies of education, teaching, and evaluation (Saputra, 2016). HOTS features application, analysis, synthesis, and assessment capabilities (Tambunan & Naibaho, 2019). Students achieve successful mastery of an idea when they can think at higher levels, where they can not only retain and comprehend a notion, but also analyze, synthesize, evaluate, and create one. Implementing learning innovations is necessary to cultivate students' critical thinking capabilities (Suparni, 2020).

Several studies on the HOTS-based blended learning strategy to develop students' critical thinking skills have yet to be undertaken on a broad scale, as have a number of nearly identical studies (Darwis et al., 2020). The conclusion of this study is that the application of the blended learning model in conjunction with the problem-based learning model has a favorable influence on the critical thinking skills of students about acids and bases. In addition, the performed research (Kurniawan et al., 2021) was based on the results of research learning utilizing the 4C-based HOTS assessment module, which is more orienting students towards critical thinking. Then another investigation from (Budiarti & Harlis, 2020). This study examines the critical thinking abilities of Jambi students enrolled in a microbiology program with a standard printed curriculum by utilizing video education focused on the local culture of Jambi. Compared to traditional groups, video-based instruction on Jambi indigenous knowledge systems has a significant impact on students' reasoning skills, according to the findings. Following is research from (Raiyn, 2016). In this study, Raiyn introduced a novel concept based on visual learning methodologies to enhance students' analytical reasoning skills. Using his SWOT method to evaluate their HOTS skills, Raiyn contrasted visual and conventional learners. According to performance studies,

visual equipment can assist students in improving their HOTS abilities.

Several of the aforementioned research demonstrate the effectiveness of blended learning on students' critical thinking skills. However, the aforementioned research has not yet been applied to physical education instruction. Therefore, the researchers attempted to investigate the impact of the HOTS-based blended learning model on the critical thinking skills of students. In addition, in implementing this blended learning, consideration must be given to the health protocol policy outlined in the Ministerial rule addressing the learning organization guidelines for the new academic year 2021/2022. So that the learning process can be conducted in a pretty secure manner.

METHOD

Due to a control group and a random selection of research subjects, the employed research method is a true experiment. Concurrently, cluster random sampling is employed to identify the research topic. Students in the ninth grade from junior schools in West Java, Indonesia, were selected at random to participate in this study. The instruments utilized for this study are listed in **Table 1**.

Table 1. Research Instrument

Indicator	Statement
Wishful Thinking	Regarding logic, I understand more than friends.
	I am capable of grasping everything linked to rigorous thought.
	I can learn how to think rigorously.
	I am greater than many of my contemporaries at learning to reason appropriately.
Project Value Achievement	It is critical for me to understand how to reason appropriately.
	It is critical for me just to be able to reason well.
	It is critical for me to make proper use of my intellectual abilities.
The Worth of Utility	I must be able to solve difficulties effectively.
	Critical thinking can assist me in becoming a better professional.
	Critical thinking would be beneficial to me in the future.
	In daily life, critical thinking is beneficial.
	Other topics and courses benefit from critical thinking.

Task Inherent Worth	Before making a decision, I like to think things over thoroughly.
	I enjoy learning new things that help me enhance my thinking.
	I enjoy critical thinking.
Fee	I enjoy debating methodically.
	If I have a situation that necessitates critical reasoning, I am willing to forego time that I might otherwise dedicate to other activities.
	I am willing to put in a lot of time and energy to develop my thinking skills.
	It is worthwhile to devote effort and time to learning and applying critical thinking skills.

The **Table 1** above is the instrument used in the study. The instrument used in this study refers to (Valenzuela et al., 2011), which consists of five components, including 1) Wishful Thinking, 2) Project Value Achievement, 3) The Worth of Utility, 4) Task Inherent Worth, and 5) Fee. Meanwhile, to clarify a research plan, there must be a research flow. The research steps are as follows **Figure 1**.



Figure 1. Research Flow

Based on the **Figure 1** above, the first step in this research is preparation, the researcher prepares and collects things related to this research such as phenomena found in the field, determining variables, and looking for sources to facilitate the research process.

Implementation Phase of Research. Using basic random side-by-side, the population and sample are determined as the initial stage in the implementation phase of the research. The researcher then selects an experimental group and a control group. In addition, the researchers administered an initial test (pre-test) of students' critical thinking skills to determine the extent to

which these skills existed before to treatment. The subsequent stage is to administer treatment or therapy. Using the HOTS-based blended learning approach to teach the physical education huge ball game to the experimental group, treatment was administered. The research design utilized is a pretest-posttest control group design, which is depicted more clearly in the following **Figure 2**.

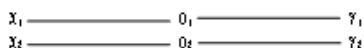


Figure 2. Research Design

Information:

- X1: Pretest experimental group
- X2: Pre-test control group
- Y1: Posttest experimental group
- Y2: Posttest control group
- O1: Blended learning model treatment
- O2: Conventional learning model treatment

Furthermore, the final stage of the research is to analyze the data on the results of the initial test (pre-test) and the results of the final test (post-test) using statistical tests. This was followed by drawing conclusions based on the results of statistical tests.

RESULTS AND DISCUSSION

The researchers discovered a variety of data that was ready to be processed, evaluated, and drawn conclusions from based on their findings. The demographics of the research sample are displayed in **Table 2**.

Table 2. Research Sample Demographics

Data	mean	SD	Min	Max	N
Age	14.46	0.51	14	15	26
Height (Cm)	157.38	9.21	140	169	
Weight (Kg)	47.76	11.37	30	69	
BMI	19.52	5.28	10.5	30.67	

The average age of the sample is 14.46 years, the average height is 157.38 centimeters, the average weight is 47.76 kilograms, and the average

body mass index is 19.52 based on the demographics presented in table 2 on the description of the research sample (Normal).

As the study's sample, grade 9 junior high schools' scores on a test of critical thinking skills constitute the data acquired from this research. The following is an overview of statistics pertaining to the ability to think critically, as presented in **Table 3**.

Based on **Table 3**, it can be seen that the experimental group has a pre-test standard deviation value on students' critical thinking skills of 8.06 and an average of 100.77, the post-test standard deviation value on students' critical thinking skills is 9.80 and an average of 115.62. On the other hand, while the control group has a pre-test standard deviation value on students' critical thinking skills of 8.69 and an average of 102.23, the post-test standard deviation value on students' critical thinking skills is 7.9 and an average of 103.08.

Based on **Table 4** of paired sample t-test results for the experimental group, the p-value of 0.000 < 0.05, then Ho is rejected, and H1 is accepted, which means that there is a significant influence on student's critical thinking skills using blended learning models and found an increase in students' critical thinking skills. Which is significant at 87.16%. Meanwhile, a p-value of 0.379 was obtained in the control group, so Ho was accepted, which means there is no effect of conventional learning on critical thinking skills.

Information :

- Ho is accepted if the p-value > 0.05, then there is no significant difference.
- Ho is rejected if the p-value < 0.05, then there is a significant difference

Sentence hypothesis:

- Ho: There is no significant increase in critical thinking skills
- H1: There is a significant increase in critical thinking skills

Table 3. Summary of Pretest and Posttest Data on Critical Thinking Ability

Group	Variable	Pre-test		Min	Max	Posttest		Min	Max	N
		Average	SD			Average	SD			
Experiment	CTA	100.77	8.06	89	110	115.62	9.8	91	127	13
Control		102.23	8.69	87	114	103.08	7.9	89	114	

Table 4. Results of Paired Sample T-Test

Data	Avg ± SD	Different	Enhancement (%)	t-count	p-value	conclusion
Experiment	Pre 105.54	10.08	87.16	-5.171	0.000	Significant
	Post 115.62					
Control	Pre 102.23	0.84	99.19	-0.914	0.379	Not significant
	Post 103.07					

Using the paired sample t-test to analyze the data, it was determined that the hots-based blended learning model had a substantial impact on the pupils at Ciamis Junior High School 5's critical thinking skills, with a p value of 0.000 0.05. Therefore, H_0 is rejected and H_1 is approved, indicating that the hots-based blended learning paradigm has a considerable effect on students' critical thinking abilities. In addition, there was an 87.16 percent boost in the pupils' critical thinking skills.

This is in accordance with the researcher's hypothesis that the hots-based blended learning paradigm has a considerable impact on students' critical thinking abilities. In addition, these results indicate that the learning process utilizing the blended learning model based on hotspots is appropriate for developing students' critical thinking skills on the topic of big-ball sports in physical education. This result is consistent with the findings of (Sidiq et al., 2021), which indicate that his research utilizing HOTS-based questions effectively enhances the critical thinking skills of elementary school pupils during scientific learning.

In addition, HOTS-based blended learning is one model that can build the abilities needed during a pandemic, where government laws connected to face-to-face learning of 50% are also a reason why teachers must be more creative in their approach to learning management. This is consistent with the belief (Fariska & Erman, 2017) that combining online learning (web-based learning) and face-to-face learning (face-to-face learning) can be an effective technique for learning. So that students and teachers may engage in online learning at any hour of the day or night (Moskal et al., 2013).

In the civilization of the 5.0 era, critical thinking is also a necessary ability to cultivate. Important because, with critical thinking, kids will be able to think clearly, solve issues effectively, and make sensible decisions about what to believe or do (Susilawati et al., 2020). This viewpoint aligns with as well (Seruni et al., 2020). Students must therefore possess critical thinking as one of their 21st-century talents.

The HOTS-based blended learning paradigm is effectively used to train students' critical thinking skills in physical learning, according to the specific objectives of the research. This can be shown by the increase in the N-Gain value of each student and the N-Gain of each indicator. Thus, critical thinking skills show a favorable relationship with HOTS-based mixed learning.

CONCLUSION

Based on the results of the study, it was also found that blended learning based on hots was able to improve student's critical thinking skills. This is proven through learning physical education in schools with sig. 0.004. Therefore, hots-based blended learning is one model that can develop the skills needed during the pandemic. Besides that, critical thinking is also a skill must be developed in society in the 5.0 era in the future.

Research on the same topic should be carried out in the future, with the variability of educational levels of different subjects or educational institution settings. The absence of differences in terms of gender and cognitive function in viewing students' critical thinking skills is the main background that needs to be discussed further.

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