

# Video analysis with youtube platform for Physical Education, Health, and Recreation students's Higher Order Thinking Skills (HOTs)

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## ABSTRACT

Learning using technology-based media has become the main thing in learning in the 4.0 era to support high-level life skills, one of which is thinking skills. The purpose of this study is to re-prove the use of video analysis, especially using the Youtube platform for students' Higher Order Thinking Skills (HOTs). The study used an experimental design with a factorial design in a population of 312 PJKR level IV students who were taking Sports Pedagogy lectures. The sample consisted of 79 people in the experimental group and 80 people in the control group who were taken using cluster random sampling technique. The research was conducted from April 2020 to July 2020 when online lectures were conducted during the Covid 19 Pandemic with 12 meetings. The results show that there are differences in student HOTs in the group that uses video analysis with the Youtube platform and those that do not. The difference in HOTs is also seen in gender groups. HOTs in students can be improved through video analysis on the Youtube platform with learning stages that contain the HOTs concept, namely Concept, Analytical, Understanding Knowledge, and Create.

**Keywords:** Video analysis; youtube platform; HOTs



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## INTRODUCTION

The Indonesian nation is faced with external challenges in the form of the presence of the Industrial Revolution 4.0 which relies on a cyber physical system, supported by technological advances, information bases, knowledge, innovation, and networks, which marks the era of affirmation of the emergence of the creative century (Supianti, 2018). To face these challenges, of course, it must be balanced with quality education in order to ensure the growth and development of quality Human Resources (HR) who can act and think quickly, precisely, and are able to adapt well in anticipating and overcoming the negative impacts of the wave of great change, (Kemendikbud, 2018). Fast thinking skills or more commonly known as Higher Order Thinking Skills (HOTs) are one of the main assets to be able to overcome global challenges that continue to

erode the world of education. Especially for teachers (Rump et al., 2016), in order to get used to being creative and innovative to create effective learning for students (Supianti, 2018).

It is undeniable that technology has entered into various aspects of the life of human civilization in the era of the Industrial Revolution 4.0, not least in the field of education. This global demand requires the world of education to always adjust technological developments to improve the quality and quality of education, especially physical education (Lestari, 2018), to always adjust technological developments in order to improve the quality and quality of physical education implementation in the direct learning process and assignments (Koekoek et al., 2018). The use of video analysis is believed to be able to bridge the increase in HOTS in students (Hopson, 2014). Video analysis provides motion recordings that must be seen by students (Laughlin et al., 2019), then students analyze the movements presented through videos about the right or wrong of the movement, the last stage students are given the opportunity to conclude, so they can make a series motion that they know after analyzing motion through video (Gonza, 2015).

All of these stages are in the HOTS thinking stage, namely Apply, Analyze, Evaluate and Create (Nachappan et al., 2018). Another study also stated that students' interpretation skills using video analysis were higher than those who only used traditional teaching (Hockicko et al., 2014). Learning activities that use analytical videos stimulate students to think harder in order to conclude (Johnson et al., 2019). The use of analytical videos watched on the Youtube channel can also affect the level of mastery of the material in students (Andrist et al., 2014). So far, the source of motion videos from Youtube has become the most widely used material by physical education teachers (Schieble et al., 2015). Information retrieval assisted by video analysis develops students' knowledge base (Chan, 2016), because it can connect students to data networks based on visual artifacts and expose them to transforming invisible thoughts into visible ones. Students can understand knowledge more completely and faster than before (Zhang & Chan, 2020). However, previous research has not revealed that gender differences in the use of video analysis have an effect on students' HOT skills (Nowels & Hewit, 2018).

Video analysis in learning using Youtube has been widely used. The use of video analysis with Youtube media has increased students' ability to understand teaching materials (Ndiokubwayo et al., 2020), students' learning motivation has increased (Azor et al., 2020), improved thinking skills in all the material they learn, (Tella et al., 2020). This Youtube media helps to simplify complex concepts and procedures by presenting videos that can be played back regardless of place and time, so this platform is ensured as a practical teaching tool among prospective teacher students (Rangarajan et al., 2019).

Most studies using video analysis in learning to improve HOTS are carried out on students (Ibrahim & Elfeky, 2018; Mcloughlin et al., 2016; Richland & Simms, 2015). Research conducted on prospective physical education teacher students in using video analysis during learning shows that video analysis can lead to learning satisfaction (Zhang & Chan, 2020), students who lead to HOTS (Barnett & Francis, 2018; Carroll et al., 2020; Deschryver, 2016; Ibrahim & Elfeky, 2018; Zhang & Chan, 2020).

Information retrieval assisted by video analysis develops students' knowledge base (Chan, 2016), because it can connect students to data networks based on visual artifacts and expose them to transforming invisible thoughts into visible ones. Students can understand knowledge more completely and faster than before (Zhang & Chan, 2020). However, previous research has not revealed that gender differences in the use of video analysis have an effect on students' HOT skills (Nowels & Hewit, 2018). Therefore, video analysis must be recognized as a supporting technology in learning, on any material (Coogle et al., 2019). Along with previous research, this study aims to reveal the use of video analysis in learning for students' HOT skills by distinguishing gender. The use of applications or web that specifically displays videos for analysis and the existence of discussion forums in it as feedback is almost non-existent (Laughlin et al., 2019). Therefore, making learning videos analysis to support the use of technology for students' HOT skills needs to be reveal.

## METHOD

This research method uses an experimental method with a factorial design. This study compares the effect of learning with video analysis using the Youtube platform (X) and not using the Youtube platform on HOTS (Y) students of the PJKR STKIP Pasundan Study Program by distinguishing male and female gender

(moderator variable) in the Physical Education Pedagogy course. The population in this study were 312 fourth-grade students from 10 classes who were taking Physical Education Pedagogy courses. The sample selected by using cluster random sampling technique consisted of four classes, namely 4C & 4D classes as many as 79 students and 4A & 4F as many as 80 students.

The research was carried out starting from April 2020 to July 2020 when lectures were online during the Covid-19 Pandemic with a total of 12 meetings. In accordance with research that threats with 12 meetings for HOTS are considered effective (Mahoney & Harris-reeves, 2017), and will have an impact on students' thinking perspectives (Vidergor, 2017). The instrument used is the HOTS Questioners that have been developed for the world of education (Zhang & Chan, 2020). The following is an example of the procedure for using video analysis using the Youtube platform for student HOTS:

**Table 1. Example of Video Analysis Procedure for HOTS in Learning**

| Youtube Link                                | Video Duration | Category                | Questions   | HOTS Component                               |
|---|----------------|-------------------------|---|--|
| https://www.Youtube.com/watch?v=BTsmNkWC0mM | 27:25"         | Concept                 | Does the teacher appear to be doing apperception, giving feedback during the learning process and conducting evaluations? | Learn to get new information from videos.    |
|   |                | Analytical              | What should the teacher do when giving apperception?  | Analyzing skills from video                  |
|   |                | Understanding Knowledge | When students do not pay attention to the teacher during apperception, what should be done?                               | Integrating information and decision making. |
|   |                | Create                  | How to make an arrangement of activities that must be done by the teacher during apperception?                            | Evaluation, planning, and execution          |

Measurement data were analyzed using ANOVA to see the difference in the effect of video analysis on HOTS on gender differences.

## RESULTS AND DISCUSSION

HOTS measurement data on students were calculated descriptively statistics to see the average, standard deviation and standard deviation. Table 2. Explains the results of the data description.

**Tabel 2. Description Data**

| VideoAnalysis | Statistic      | HOTS                    |          |
|---------------|----------------|-------------------------|----------|
|               |                | Bootstrap <sup>a</sup>  |          |
|               |                | 95% Confidence Interval |          |
|               |                | Lower                   | Upper    |
| VA            | Mean           | 174,59                  | 174,59   |
|               | N              | 79                      | 79       |
|               | Std. Deviation | 20,761                  | 20,761   |
|               | Range          | 124                     |          |
|               | Variance       | 431,039                 | 431,039  |
| TVA           | Mean           | 146,60                  | 146,60   |
|               | N              | 80                      | 80       |
|               | Std. Deviation | 38,779                  | 38,779   |
|               | Range          | 124                     |          |
|               | Variance       | 1503,787                | 1503,787 |
| Total         | Mean           | 160,51                  | 160,51   |
|               | N              | 159                     | 159      |
|               | Std. Deviation | 34,086                  | 34,086   |
|               | Range          | 124                     |          |
|               | Variance       | 1161,846                | 1161,846 |

From the data in table 1 shows that the group that is given treatment (VA) has a value of  $\bar{x} = 174.59$ ;  $s=20.8$ ; and  $s^2=431.0$ . Meanwhile, the untreated group (TVA) has a value of  $\bar{x}=146.60$ ;  $s=38.8$ ; and  $s^2=1503.7$ . The research data has been tested for normality showing a value of 0.876 with  $p = 0.005$  meaning the data is normally distributed. Furthermore, the data are analyzed using ANOVA, the data is shown in table 3.

**Table 3. The Results of The ANOVA Calculation in The Treatment and No-Treatment Groups**

|                      |                | Sum of Squares | df  | Mean Square | F      | Sig.        |
|----------------------|----------------|----------------|-----|-------------|--------|-------------|
| HOTs * VideoAnalysis | Between Groups | 31151,498      | 1   | 31151,498   | 32,088 | <b>,000</b> |
|                      | Within Groups  | 152420,238     | 157 | 970,830     |        |             |
|                      | Total          | 183571,736     | 158 |             |        |             |

The results show that the value of sig.  $p = 0.43 < p = 0.05$  which means that the hypothesis is accepted. In conclusion, there are significant differences in students' HOTs seen from differences in gender, male and female.

The results showed that there were differences in HOTs in students after being given a learning intervention using video analysis with the Youtube media platform and those without intervention. Recent studies have shown that there is a significant effect on the use of visual analysis using both images and videos on the mastery of student learning outcomes and the improvement of higher order thinking skills in students (Hopson et al., 2001; Nachiappan et al., 2018; Zhang & Chan, 2020).

Information search assisted by video analysis develops students' knowledge base (Chan, 2016), because it can connect students to data networks based on visual artifacts and expose them to transforming invisible thoughts into visible ones. Students can understand knowledge more fully and faster than before (Zhang & Chan, 2020). Therefore, video analysis must be recognized as a supporting technology in learning (Coogole et al., 2019). HOTs in students will develop when there are questions in learning (Ibrahim & Elfeky, 2018). One of the factors that can be manipulated in the learning process is the use of media, the media used in this study is the Youtube platform (Cousins & Ross, 2014).

The increase in HOTs in students depends on the way the teaching is carried out by the teacher. HOT occurs when a person takes in new information, and the information is stored in memory and it is interconnected and rearranged and extended to achieve a goal or find possible answers in a confusing situation. Indicators to measure higher order thinking skills include: analyzing, evaluating, and being creative (Permana et al., 2018). There are 4 dimensions of teaching in order to improve students' HOTs, namely Teaching for Thinking, Teaching of Thinking, Teaching with Thinking and Teaching about Thinking (Yeung, 2016). Table 1 explains the teaching concepts for HOTs to students.

These four dimensions of HOTs teaching can be adopted by physical education teachers to improve students' HOTs skills through video analysis on the Youtube platform. Research shows that an increase in HOTs during the teaching and learning process will occur when using the right strategies and approaches, meaning that it can lead students to always think (Peterson et al., 2016). The learning approach using technological media in the form of learning analysis videos on the Youtube platform is one of the learning strategies for student HOTs, this strategy will lead students to think (Koekoek et al., 2018; Laughlin et al., 2019). Of course, the didactic design of using video analysis in applications for student HOTs must be considered.

The difference in the results of HOTs on students in terms of gender is clearly visible in this study. One of the factors that can affect student HOTs is gender differences (Lee & Choi, 2017), although this influence does not directly have an impact (Wan et al., 2018), but depends on the presentation of the material and the teacher's teaching strategy (Vidergor, 2017). The effectiveness of using audiovisual media on students' critical thinking and HOTs shows that it is proven effective (Brown-Kramer, 2020). Another study found that there were differences in thought patterns and mastery of material in terms of gender between learning using audio-visual and conventional (Liao, 2020).

Gender differences between men and women in using technology including accessing Youtube are determined by culture and environment (Azor et al., 2020). In addition, this difference appears due to the presentation of lectures conducted by the teacher in one session (Vidergor, 2017). The use of appropriate

learning media and technology that is in accordance with the interests between men and women (Mooney & Hickey, 2017). Male students tend to have the ability to think to assume in solving problems compared to female students (Yeung, 2016).

A pleasant learning atmosphere by using new media in it (Loughlin et al., 2013), such as the use of videos on the Youtube platform will make students have fun learning and be able to follow the flow of their minds to be ready to accept any direction from the teacher (Azor et al., 2020), including analyzing videos for their HOTS. The process of presenting learning in the form of analytical videos using the Youtube media platform is felt as a form of teacher strategy in presenting learning that is in accordance with culture (Calderon & Sood, 2018), and student habits in accessing Youtube on a daily basis (Tella et al., 2020). This makes it easier for them to learn and think at a higher level.

The results of this study can be used as a form of learning to prepare students to think logically, analytically and able to create something for contextual benefit at the academic level and in everyday life. Increasing HOTS in students through learning can use technology media that they often access as part of their daily culture, for example the Youtube platform. With this, they will be happy to be involved in the learning process that contains stages to improve HOTS.

However, the treatment in this study does not guarantee that HOTS in students will change permanently, continuous treatment is needed in the form of a learning process whose stages support the improvement of HOTS (Ichsan et al., 2019). In addition, the strategy of providing technology-based learning media also needs to be adjusted to the stages of HOTS and the pleasure of students to access them (Hopson, 2014). Further research is needed on the use of other types of technology-based learning media platforms to see differences in HOTS results for students so that they can find an appropriate technology-based learning media platform for increasing HOTS in students.

## CONCLUSION

Based on the results of the study, it can be concluded that there are differences in student HOTS who are taught through video analysis using the Youtube platform and those that are not given. Differences in HOTS also appear in the gender in the group that is treated with video analysis using the Youtube platform and those who are not. These results indicate that HOTS in students can be improved through video analysis with learning stages that contain the concept of HOTS, namely Concept, Analytical, Understanding Knowledge, and Create. The results of this study can be used as a form of learning to prepare students to think logically, analytically and be able to create something for contextual benefit at the academic level and in everyday life. Recommendations for lecturers that the didactic design in using video analysis in applications for student HOTS must be considered in the learning and learning process at the student level.

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## CONFLICT OF INTEREST

There is no conflicts of interest in this article. The authors declare that the result of this study was not affected by any parties or sponsors.

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