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Effectiveness of Project-Based Learning Video on Physical Fitness Level and Nutritional Status

Wildan Alfia Nugroho¹, Mesa Rahmi Stephani², Wulandari Putri³, Mukhlisin⁴, Sayid Fariz BSA⁵, Dody Tri Iwandana⁶, Witri Suwanto⁷, Yogi Akin⁸, Achmad Syakur Fahri⁹

¹²³⁴⁸⁹ PGSD Physical Education Study Program, Universitas Pendidikan Indonesia

⁵Sports Science Study Program, Universitas Muhammadiyah Semarang

⁶Sports Science Study Program, Universitas Mercubuana Yogyakarta

⁷Physical Education Study Program, Universitas Tanjungpura

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Abstract

This research aims to examine the effect of Video Project-Based Learning on the Physical Fitness Level and Nutritional Status of MKDU Physical Education and Sports Students at the Indonesian Education University. The research method uses an experimental pretest-posttest group design. The sample in this study was students from the Indonesian University of Education who took part in MKDU Physical Education and Sports with an age range of 18-22 years, totaling 37 students. The sampling technique used was cluster random sampling. The research instruments used were the Cooper Test to determine fitness level and BMI to measure nutritional status. Data analysis used the Paired Sample T-Test and the N-Gain Score test with SPSS version 21 software. The research results showed a significant increase in the VO2Max value between the pre-test and post-test results with Sig. $0.000 < 0.005$. Meanwhile, the average BMI value is 20.5, including the normal category. The N-Gain Score test for VO2Max is 0.22 with a moderate level of effectiveness. Project-Based Learning videos have been proven to have a significant effect on physical fitness and nutritional status.

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*Corresponding email : wildanalfian@upi.edu

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INTRODUCTION

Currently, the increase in non-communicable diseases (NCDs), such as heart disease, stroke, cancer, diabetes, and chronic lung disease has increased globally. The WHO reports that nearly 70% of global deaths are caused by NCDs. Reis et al. (2019) revealed that the prevalence of chronic non-communicable diseases has increased worldwide and become a major cause of morbidity and mortality in many regions of the world, including the Asian Region. The results of the Basic Health Research (Riskesdas) in 2007 showed that of the 10 highest causes of death, 6 were caused by non-communicable diseases (NCDs).

The ease of access to technology that is not matched by the competence to use it positively has led to a new life habit called sedentary behaviour. According to Tremblay et al., (2017) the definition of sedentary behaviour is waking behaviour characterised by energy expenditure of < 1.5 metabolic equivalents (METs) while in a sitting or lying position..

Sedentary activities are activities that refer to the type of activity carried out outside of sleep time, characterised by very little energy expenditure, namely <1.5 METs (P2PTM KEMENKES RI, 2017). Behaviours that illustrate sedentary behaviour include sitting or lying down for long periods of time, such as playing games, watching television (TV), sitting in front of a computer/laptop, browsing social media such as Tiktok, Instagram, YouTube, Facebook, Twitter, and other media questions. Some factors that cause

sedentary behaviour include technology, for example, gojek or grab applications. This application provides a number of services such as shopping and food delivery services that can be done using a mobile phone without having to go out of the house. This is both beneficial and detrimental if done for a long time.

This habit will cause a person to be lazy and tend to stay at home. The next factors are video games, watching television, surfing the internet, online learning, and social media. COVID-19 has worsened this situation, government policies related to area restrictions, work from home, online learning, and also the prohibition of activities outside the home encourage high sedentary behaviour and make the number of physical inactivity and obesity increase dramatically (Jahja et al., 2021). Other factors include increasing laziness, an unfavourable environment for physical activity, and government policies.

As explained earlier, sedentary behaviour is associated with many health problems, such as obesity, worsening mental health or stress, type-2 diabetes, heart disease, cancer, emotional, and cognitive problems (Dharmastuti et al., 2018; Kurdaningsih et al., 2016; Pengpid & Peltzer, 2019; Tan et al., 2021; Uddin & Khan, 2019; Zhu & Owen, 2017). Sedentary behaviour has become an important focus almost all over the world, including Indonesia. In Indonesia, obesity is one of the national problems currently being faced. According to the Indonesian Ministry of Health (2018), in Indonesia, those aged 18 years and over are

overweight by 13.5% and 28.7% are obese. In children aged 5-12 years, 18.8% were overweight and 10.8% were obese.

The Indonesian government, through the Ministry of Health, through the P2PTM (Prevention and Control of Non-Communicable Diseases) programme, has made various efforts and strategies to reduce sedentary behaviour and increase physical activity. This is stated in the National Medium-Term Development Plan (RPJMN) 2015-2019. Efforts made include the Healthy Living Community Movement Programme (Ministry of Health of the Republic of Indonesia, 2019) and specifically the Obesity Management Principles (Ministry of Health of the Republic of Indonesia, 2018), but efforts from the Government alone are not enough to control this problem. This is because sedentary behaviour can only be controlled by oneself and requires realistic planning with achievable targets. On the other hand, the role of technology can also help improve the health status of an individual if used properly, one of which is through Video Project-Based Learning.

Video Project-Based Learning is a learning model that uses video projects or activities as media. According to Kemdikbud (2013), learners conduct exploration, assessment, interpretation, synthesis and information to produce various forms of learning outcomes. Project-Based Learning is a learning method that uses problems as the first step in gathering and integrating new

knowledge. based on their experiences in real-life activities.

In addition, Video Project-Based Learning is considered a comprehensive teaching approach that engages students in co-operative and sustained inquiry activities. According to Grant (2002), project-based learning not only examines the relationship between theoretical information and practice, but also motivates students to reflect on what they are learning in a real project and can improve student performance. With this project-based learning, students are expected to be more active and consistent in doing sports activities because it is required as a project that must be done. Hopefully, the level of physical fitness and nutritional status in students can increase, and improve the overall health status of students and avoid sedentary behaviour. With the above background, the researcher is interested in the research title 'Implementation of Video Project-Based Learning to increase Students' Physical Fitness Level and Nutritional Status' to be implemented in MKDU Sports students at Universitas Pendidikan Indonesia.

METHODS

The research approach used uses quantitative research with experimental methods. Experimental research is the most conclusive scientific method because researchers directly give treatment to research samples and then study the impact. This research study tends to lead to the clearest interpretation (Fraenkel, Wallen, & Hyun, n.d. 1932).

The research design used was pretest-posttest group design. The research sample was conducted pre-test, treatment, post-test (Creswell & Poth, 2018). This study began by conducting an initial test, then providing treatment for the implementation of Video Project-Based Learning in the experimental sample group for 16 meetings and then conducting a final test.

Participants

The population of this study were Biology Education students in 2020, Faculty of Mathematics and Natural Sciences Education, Universitas Pendidikan Indonesia in male and female students with an age range of 18-22 years who took MKDU Physical Education and Sports. The number of respondents in this study were 37 students. Sample measurements for experimental and comparative research, recommended at least a minimum of 20 people per (Fraenkel, Wallen, & Hyun, 2012). The sampling technique in this study used cluster random sampling technique. Cluster random sampling is sampling by randomly selecting groups. If simple random sampling is effective for selecting large individual samples, then cluster random sampling is effective for determining large group/class samples.

Sampling Procedures

The instruments used in this study were the cooper test and Body Mass Index (BMI). The Cooper test is a widely used test to measure cardiovascular endurance, or the ability of the heart and lungs to deliver oxygen to the body

during physical activity. The test was developed by Dr Ken Cooper in 1968 and involves running as far as possible in 12 minutes. The distance covered in the test is used as an indicator of overall cardiovascular fitness (Maksud, M. G., & Coutts, K. D., 1971). The test is relatively simple to perform, requires minimal equipment and can be performed on a track or field. The test is also suitable for individuals of all ages and fitness levels, and can be easily adapted for people with disabilities. To take the Cooper test, individuals warm up for a few minutes, then run as far as possible in 12 minutes, the distance travelled is recorded. The distance travelled can be used to estimate VO₂max, which is a measure of cardiovascular fitness and endurance.

Body Mass Index (BMI) is a widely used tool to assess a person's nutritional health status. It is calculated by dividing an individual's weight in kilograms by their height in metres squared (kg/m²). The resulting number is then compared to a set of standardised categories to determine whether a person is underweight, normal weight, overweight, or obese. BMI is widely used because it is simple, inexpensive, and non-invasive, and is widely accepted as a rough indicator of body fatness and the risk of related health problems.

Design or Data Analysis

The findings of the results of this study are based on data processing steps consisting of: (1) Description of research data results (2) Prerequisite test analysis,

(3) Paired sample t test and (4) N-Gain Score test using spss version 25 application.

RESULT

Tables & Figures

The results of the data obtained from this study can be seen in the frequency distribution table and it can be concluded that students fall into the very good category in their physical fitness are only 2 people, 11 people fall into the good category, 21 people fall into the sufficient category and 3 people fall into the less category.

Table 1. Distribution Frequency

Description	Frequency	Percent
Very Good	2	5,4%
Good	11	29,7%
Moderate	21	56,8%
Deficient	3	8,1%
total	37	100%

In addition to data from the physical fitness category, the sample is also seen from the results of the BMI category table, showing that there are 3 people who fall into the thin category, 31 people who fall into the normal category, 2 people into the overweight category and 1 person into the obese category.

Table 2. Kategori BMI

Description	Frequency	Percent
Skinny	3	8,1%
Normal	32	83,8%
Overweight	2	5,4%
Obesity	1	2,7%
total	37	100%

After the data was obtained from both physical fitness and BMI, the researchers analysed the data by testing the normality of the data, based on the results of Shapiro-wilk normality testing, The data shows that the results of all the significance values are greater than the significance level, namely $\text{sig} > 0.05$, so it can be concluded that all data can be said to be normally distributed and suitable for conducting the next stage of the test.

Then after the data is declared normal, the test will continue by testing its Homogeneity, so the researcher gets the following data description. all significance values are greater than the significance level, namely $\text{sig. count} > 0.05$, so it can be concluded that all data is said to be homogeneous or the same and is suitable for the next stage test.

After the data is said to be normal and homogeneous, the researcher conducts a more detailed data analysis, namely testing the paired sample t test, Based on the results of paired sample t test results, the initial and final VO2Max results show that the sig value is $0.000 < 0.05$, meaning that the data results show that there is a significant increase between the initial VO2Max test results and the final VO2Max.

DISCUSSION

Judging from the results of the N-gain score test, that the N-gain score value of $0.22 < 0.3$ means that the data is included in the medium criteria. While the N-gain percent value of $22.5\% < 40$ means that the data falls into the less effective category. The implementation of Video Project-Based Learning (VPBL)

in improving students' physical fitness level and nutritional status is an interesting approach in the context of education and health. This approach combines project-based learning with a focus on fitness and nutrition aspects, which can have a positive impact on students' well-being. This study aims to determine the significant impact on the implementation of Video Project- Based Learning on improving physical fitness levels and nutritional status in university students.

This project-based learning not only examines the relationship between theoretical information and practice, but also motivates students to reflect on what students learn in learning into a project to produce good student performance (Grant, 2002). From the facts in the field and from the results of data processing, it shows that students' physical fitness has increased significantly and the average student falls into the category of adequate norms when following Video Project-Based Learning and the nutritional status of students also falls into the normal category when following Video Project-Based Learning.

This means that project-based learning makes students realise that they need to be more extra in participating in learning. This causes minimal sedentary behaviour or it can be said that students do physical activity activities when carrying out Video Project-Based Learning. Therefore, students' physical fitness can also increase, because the factors that affect physical fitness are one of them physical activity (Shomoro &

Mondal, 2014). In addition, other factors that can affect physical fitness are food and nutrition, because the physical activity is one of the factors that affect physical fitness (Shomoro & Mondal, 2014). Food and nutrition are necessary for the body to maintain body condition and support physical activity.

If a student's nutritional status is good then, his physical fitness will also be good because, proper nutritional status is very important for overall health and well-being, playing an important role in preventing various diseases and disorders, including obesity, diabetes, heart disease, and certain cancers, meaning that the statement is in line with the definition of physical fitness, which is healthy and fit physically and mentally. Being physically fit means having a balance of all these components and having sufficient ability in each to perform daily activities without undue fatigue or risk of injury (Carter, C. W., & Micheli, L. J., 2011).

The increase in students seen from the test results shows that there is a significant increase, meaning that Project-Based Learning Video learning can improve students' physical fitness and nutritional status. However, for the level of effectiveness of learning is less effective, it is possible because of the lack of student motivation in doing learning, difficulty in adjusting the video when doing activities, limited physical activity, students cannot measure their abilities and so on.

Another factor in Video Project-Based Learning that can improve

physical fitness and nutritional status is the treatment given to students, namely using the Cooper test to measure cardiovascular endurance, or the ability of the heart and lungs to deliver oxygen to the body during physical activity.

CONCLUSION (Times New Roman 12)

Based on the results of the study, the conclusion in this study is that the implementation of project-based learning videos can improve the level of physical fitness and nutritional status of Biology Education MKDU students at Universitas Pendidikan Indonesia.

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