



Analysis of Student Traveled Distance and Pulse Rate in Technical Learning Model Implementation

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Abstract

This study aims to analyze the mileage and pulse of students who apply the technical learning model to physical education subjects. Descriptive method is used to obtain information and descriptions of the distance traveled and the pulse of students during physical education learning. Participants as many as 30 students (12-13 years) were involved in this study, but only 8 students (4 boys and 4 girls) used Polar GPS. The instruments used are Polar GPS RC3 to measure the distance traveled by students and Polar Heart Rate Sensor H3 to determine the pulse of students. The results showed that the overall average of the students' pulse rates was 137.13 which was in the low to moderate category with the average mileage obtained was 0.48 km. The researcher concluded that the application of the Technical learning model in this study obtained the average pulse rate of students in the low to moderate category. This study was limited to a small number of samples due to limited tools, so further research is needed to obtain a broader picture.

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PENDAHULUAN

Learning is a process of interaction between students and educators and learning resources in a learning environment to help students learn well (Pane & Dasopang, 2017). In other words, learning is an effort to help students in the process of acquiring knowledge, mastering skills, and forming attitudes (Fitrah, Yantoro, & Hayati, 2022). The purpose of the learning process is student learning. This process can be divided into three management categories, namely routine management, core management of the learning process, and environmental management and learning materials (Soebarna, Juditya, & Gunawan, 2017). In relation to the teaching and learning process, educators are needed who understand how to teach well, one of which is the selection of effective and efficient learning models as an effort to develop student potential.

Physical education learning is very complex and has a role in various aspects of student development, such as cognitive, affective, and psychomotor aspects (Haris, Taufan, & Nelson, 2021). Physical education in schools is a physical activity in which learning leads and includes matters relating to these three aspects, which are aimed at developing the potential of students (Basuki, 2016). Therefore, educators must have the ability to plan, consider, and choose appropriate and effective learning models so that what is expected in learning can be achieved optimally. Planning, consideration, and selection in the learning model's application will influence students related to the learning objectives to be achieved.

The learning model is a way to make it easier for students to learn effectively so that they can improve their capabilities

(Setyosari, 2017). Furthermore, Ti-bahary & Muliana (2018) revealed that the learning model is a plan that is used to design teaching. The content contained in the learning model is in the form of teaching strategies used to achieve instructional goals. The selection and use of appropriate learning models in the practical teaching and learning process is an effort that must be made by every educator so that students get optimal learning outcomes (Gustiawati, Fahrudin, & Stafei, 2014). Therefore, the use of learning models must be adapted to the goals and learning needs of students.

The technical learning model is a skill learning model that emphasizes mastery of basic techniques first before playing patterns (Forrest, Webb & Pearson, 2006). This learning model is intended to form and develop students' motor habits or neuromuscular development (Fernando, 2018). The advantages of this model are repetition and mastery of techniques, so it is very suitable for strengthening basic movement patterns for students. The tactical learning model is a learning model that improves the movement techniques needed to be able to do sports that students do, for example, shooting ball techniques, throwing balls, catching balls, and so on (Juliantine, 2011). Furthermore, Fenanlampir (2020) revealed that the perfection of the basic techniques of each movement is important to determine the overall motion so that the basic movements of each form of technique needed in every sport must be trained and mastered perfectly.

Physical education learning activities in schools should be able to encourage an increase in students' physical activity in addition to focusing on the development of cognitive and affective aspects through the application of the applied learning model.

Regarding physical activity, WHO recommends children and adolescents practice for at least 60 minutes in the moderate to vigorous category (Fjortoft, et al., 2010). In addition, adequate physical activity also has a positive impact on individuals as revealed by Tremblay, Inman, & Willms, (2000) that there is a close relationship between physical activity, self-esteem, and student academic achievement.

Many previous studies have revealed data on the physical activity carried out by students through various devices to monitor student learning (Fjortoft, et al., 2009; Fjortoft, et al., 2010), but there are still few studies investigating the level of physical activity and distance traveled by students while applying certain learning models. Pulse rate measurement is one way that can be used to determine the intensity of physical activity. (Castellano & Casamichana, 2010). Furthermore, the data on the results of students' mileage during learning can also be used by educators as supporting data to analyze students' movements about how far they run or do physical activities. The results of monitoring and information on these data can be used by educators in evaluating learning in schools (Fjortoft, Kristoffersen, & Sageie, 2009). Therefore, the purpose of this study was to analyze and obtain an overview of the distance traveled and pulse rate that correlated with the category of students' physical activity levels during physical education learning that applied the Technical learning model.

METODE

This descriptive study provides an overview of the pulse rate and distance traveled by students during physical education learning. The research participants

were 30 students of the UPI Pilot Laboratory Junior High School, Earth Siliwangi Campus, aged 12-13 years, but due to the limitations of the equipment, only eight students (4 boys and four girls) used the Polar GPS research instrument and were chosen randomly.

Before collecting research data, students were given information about the benefits and procedures of using the Polar GPS device used. In this study, students carried out physical education learning by applying the Technical learning model to the soccer game material. The sub-learning material is about the basic technique of passing and then ends with a modified soccer game. The use of Polar GPS is carried out when entering core learning with a duration of 50 minutes.

The instruments used are Polar GPS RC3 to measure the distance traveled by students and Polar Heart Rate Sensor H3 to determine the pulse of students. The categories of physical activity in this study were divided into four categories based on the student's pulse rate, namely the category of low physical activity (<120 bpm), low to moderate physical activity (120-140 bpm), moderate to vigorous physical activity (140-160 bpm), and vigorous physical activity (>160 bpm), which refers to previous research (Fjortoft, Kristoffersen, and Sageie, 2009). The data from the measurement of mileage and pulse were then analyzed using descriptive statistical techniques.

RESULTS AND DISCUSSION

This study aims to analyze and provide an overview of the distance traveled and the pulse of students who apply the technical learning model to physical education subjects. The results of the acquisition data re-

garding the mileage and pulse of students during physical education learning with technical learning models are shown in table 1.

Table 1. Data on Acquisition of Mileage and Pulse of Students

	Distance (km)	Heart rate (bpm)
mean	0.48	137.13
SD	0.05	5.53
Min	0.38	129
Max	0.54	145

In Table 1, it can be seen that the average student mileage is 0.48 km with a standard deviation of 0.05. Meanwhile, the students' average pulse rate was 137.13 bpm with a standard deviation of 5.53. Furthermore, in detail, the acquisition of pulse rate measurements for each student is shown in Figure 1.

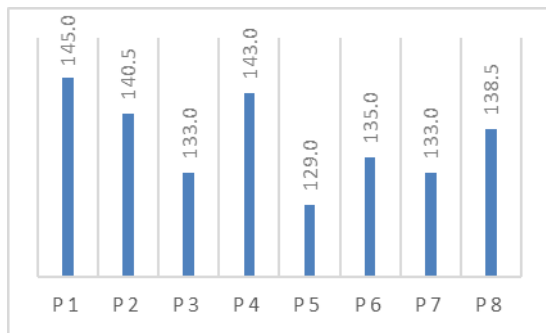


Figure 1. Obtaining Student's Pulse Measurement

Figure 1 shows the results of pulse rate measurements from eight students. The highest gain in the highest pulse rate was in P1 students with the acquisition of 145 bpm, while the lowest was in P5 students with 129 bpm gains. Furthermore, in Figure 2, information is obtained about the percentage of male and female students' pulse rates based on the physical activity category

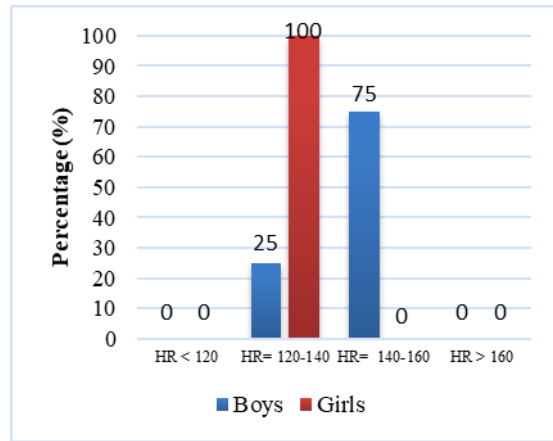


Figure 2. Percentage of Mileage and Pulse Rate of Students by category of physical activity

In Figure 2, it can be seen that most of the male students are in the moderate to vigorous physical activity category with a pulse rate of between 140-160 bpm, while all of the female students are in the low to moderate physical activity category with a pulse rate of 120-140. bpm. Furthermore, the acquisition of student mileage measurements during physical education learning can be seen in Figure 3.

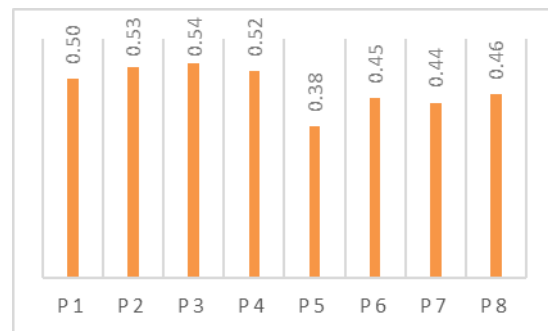


Figure 3. Achievement of Student Mileage Measurement (in km)

Figure 3 shows the results of measuring the distance traveled by eight students. The furthest mileage gain is for P3 students with a distance of 0.54 km, and the lowest mileage gain is for P5 students with a distance of 0.38 km.

Previous research revealed that the application of the Technical model has advantages in improving the basic techniques of the game being taught (Fernando, 2018). However, in this study, in terms of the overall physical activity category, students were still in the low to moderate category because the main focus of this model was the repetition of basic techniques until they were considered proficient enough to switch to the game. This is in line with the results of previous studies that the technical learning model has a less significant impact in terms of movement intensity and motivation when compared to the tactical approach (Stephani, et al., 2019).

Another finding related to the difference in pulse rates in male and female students was seen when carrying out student learning activities. Male students tend to run to find space or position to pass and receive the ball, while female students tend to be silent, waiting for the ball to be fed to them. Previous research revealed that male students achieved higher pulse rates during team activities while female students had higher pulse rates during individual activities. This means that male and female students respond differently to types of physical activity (Laurson, Brown, Dennis, & Cullen, 2008).

The Technical Learning Model broadly consists of warm-up activities, skill development, a modified game, and then the game (Forrest, Webb & Pearson, 2006). The philosophy underlying this model is that once a skill is mastered, students will be in a position to transfer these skills into game situations. In this case, educators usually modify existing games according to the skills being taught. Assessment procedures tend to be skill-based, measuring students' ability to perform skills separately and not on their actual ability to play the game.

CONCLUSION

This study concludes that the overall average pulse rate of students is in the low to moderate category by applying the Technical learning model. However, when viewed from the gender of the students, most of the male students obtained the moderate to vigorous pulse rate category and the female students in the low to moderate category. The average distance traveled by students during learning is 0.48 km. The limitations of the tool cause there is still at least a sample involved in this study, so it is hoped that in further research, the number of samples can be expanded and compared with other learning models so that a broader picture of information can be obtained.

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