Can Scientific Approach in Physical Education Improve Creativity and Physical Fitness of Junior High School Students Living on Coastal Area?

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Abstract. The purpose of this research is to analyze the influence of scientific approach in physical education towards creativity and physical fitness of Junior High School students living on the coastal area. The methods of the experiment were Pre-test and Post-test designs. The population was the students of Indramayu State Junior High School with 30 students taken as samples through simple random sampling technique. The instruments used were creativity test and Indonesian Physical Fitness Test (TKJI). The data was processed by independent t-test with the level of trust 0.05. The result of independent t-test in the component of creativity shows that t=7.489, sig.0.000, and 0.000 less than 0.005, so H1 is accepted. The physical fitness component shows z=-3.976, Sig 0.000 and less than 0.005, so H2 is accepted. Conclusion: scientific approach in physical education can improve creativity and physical fitness of junior high school students living on the coastal area.

1. Introduction

In an effort to improve the quality of human resources, the education process including physical education and sport is one of the efforts to support in achieving national education goals. Through the process of school-like formal education, students are educated, and should be nurtured and encouraged to develop their ability and potential, so that each of them could have a quality self, healthy body and spirit as well as having independent character and personality. Physical education is an integral part of the educational system as a whole. Physical education in the 20th century emphasized more on the physical fitness, motor skills, and social knowledge [1]. This means that physical education is basically an integral part of the overall system which aims to develop the health aspects, physical fitness, critical thinking skills, emotional stability, social skills, reasoning and moral action through physical activities and sport. The teaching model used in physical education in school greatly affects the creativity and physical fitness of the students, so the ability of a teacher in selecting or specifying which models to be used must be precise and appropriate to the characteristics of students. Uninteresting learning process had made the students uneager to perform the given activities, which therefore made the level of physical fitness of the students to be low. Another survey found that only 27.1% of students had engaged in physical activity to raise the heart rate and caused rapid breathing with a total of at least 60 minutes/day (CDC, 2014). In addition, the percentage of students who had participated in muscle-strengthening exercises (e.g. push-ups, sit-ups, or weightlifting) in 3 days or more during the 7 days before the survey was given declined to 51.7%, from 55.6% in in 2011 (CDC, 2014). The prevalence of attendance on physical education classes (PE) also decreased to 29.4% in 2013 from 31.5% in 2011[2].
A study found that by increasing physical fitness, children can facilitate positive outcomes including improved quality of healthy life [3]. Nowadays there are still a lot of physical education teachers who lack an understanding of the applicable learning models. The lack of teachers' knowledge about the said models only made the teaching process to be less effective for students to develop their creativity. The discovery learning model is considered to be helping to solve the existing problem in learning. The discovery learning model is one of the models for developing active student learning by finding things on their own (own investigating) so that the results will last longer in memory and will not be easily forgotten by the students. In learning through discovery, children are used to learn analytical thinking and try to solve the problems they faced by their own [4].

Other experts predicted that the approach using scientific ethics is the best for the present and future [5]. It is further stated that men were not significantly more scientifically literate than women, except in the life sciences. Using the mindset that continues to be honed and growing, the aim towards lifelong healthy living can be realized and students' intellectual and social aspect can be developed as well [6]. One of the intellectual ability is creativity. In physical education, creativity or inventiveness will allow the emergence of new ideas in solving existing problems during the learning process. The level and quality of the concentrations found at the end of each lesson is significantly higher than at the beginning. The material does not affect the concentration. Increased concentration towards the end of this lesson implies the need for careful lesson planning or even in considering to increase the duration of the lesson [7].

Other opinion stated that every person has the intelligence, but the power itself will be different for each aspect. In the learning that involves movement, students were able to express ideas, as they were involved in the process of thinking and solving problems in kinesthetic way [8].

New thoughts or ideas become the completion of the previous thoughts or ideas in solving a problem. Creativity is an ability possessed by every individual in creating something new in resolving the problems [9, 10]. In this regard, learning physical fitness needs to be associated with improving the quality of life and avoiding diseases caused by lack of movements, therefore a person who has a good physical fitness will be able to avoid sedentary diseases (hypokinetic) so that they can enjoy a good and unpretentious life [11]. The aforementioned opinion explained that low physical fitness may result in such quality of life with less support for the activities undertaken by the students both in physical education or daily activities, and therefore they do not able to enjoy a better life.

The purpose of the discovery learning model is to shape the character of students to be creative and requires students to find a learning process and find the end result of learning as an effort to increase creativity and physical fitness of students during the learning process. On the basis of these ideas, eventually writer is interested in conducting a study titled "Influence of Discovery Learning Model in Physical Education towards the Creativity and Physical Fitness of Class VIII students of SMP Negeri 2 Indramayu".

2. Method
The method used in this study is experiment, because this study aims to look at the impact of physical education and sport undertaken with scientific approaches and conventional approaches towards the students' concentration and intelligence level. The research design used in this study is a Randomized Control-group Pre Test-Post Test design since there are control and experiment groups within this study. The experiment group was given treatment with a scientific approach while the control group was given treatment with a conventional approach.

2.1. Population and Sample
The population for the purpose of this study were junior high school students in the coastal area of SMPN 2 Indramayu, as many as 2 class consisting of 60 students who were [used as] sampled. The technique used for the sampling was Simple Random Sampling. Each class consisted of 30 students, one class was treated with a scientific approach and one other class with conventional approaches.
2.2. Analysis
Data Analysis using SPSS version 22 with the following steps:
- The normality test used is Kolmogorov-Smirnov with p-value > 0.05. The homogeneity test used is Levine Test with p-value > 0.05.
- Analysis of hypotheses 1 to 4 using paired sample t test and 5 to 6 using independent t test with p-value > 0.05.

3. Result and Discussion
3.1. Result

![Histograms](image1)

Figure 1. Histogram on the Differences between Scientific and Conventional Approach towards Creativity in Coastal Area
Figure 2. Histogram on the Differences between Scientific and Conventional Approach towards Physical Fitness in Coastal Area

Table 1. Test Result of Paired Creativity Test

| Paired Sample t Test                      | T     | Sig. (2-tailed) |
|------------------------------------------|-------|-----------------|
| PRETEST_CREATIVITY - POSTTEST_CREATIVITY | -7.489| .000            |
| PRETEST_CREATIVITY - POSTTEST_CREATIVITY | -12.839| .000            |

This means that physical education using scientific approach has resulted in increased concentration of students in the coastal area. Meanwhile teaching physical education using conventional approaches has resulted in the improvement students' creativity in the coastal area.

Table 2. Test Result of Paired Physical Fitness Test

| Wilcoxon Test | Physical Fitness Test | Physical Fitness Test |
|---------------|------------------------|------------------------|
|               | Experiment Group       | Control Group          |
| Z             | -3.976                 | -4.828                 |
| Asymp. Sig. (2-tailed) | .000                  | .000                  |
This means that physical education using scientific approach has resulted in improvement of physical fitness of students in the coastal area. Meanwhile, teaching physical education using conventional approaches has also resulted in the improvement students' creativity in the coastal area.

**Table 3. Test Result of Independent Sample T Test on Creativity**

| Independent sample t test | T    | Sig. |
|---------------------------|------|------|
| CREATIVITY                | -9.917 | 000  |

**Table 4. Test Result of Mann-Whitney U on Physical Fitness**

| Physical Fitness | Experiment Group |
|------------------|------------------|
| Mann-Whitney U   | 60.000           |
| Wilcoxon W       | 525.000          |
| Z                | -5.919           |
| Asymp. Sig. (2-tailed) | .000         |

This means that physical education using scientific approach has better result compared to conventional approach towards the improvement students' creativity in the coastal area. Meanwhile physical education using scientific approach also has better result compared to conventional approach towards the improvement of physical fitness of students in the coastal area.

### 3.2. Discussion

Based on the results from processing and analyzing the existing data, there are significant influence of the discovery learning model in physical education lesson in the creativity and physical fitness of the students from class VIII SMP Negeri 2 Indramayu. This happened because the use of discovery learning model on physical education can develop the students’ ways of learning and enable them to find their own way of learning as well as enable them to search for information themselves, so that the results obtained will stay longer in their memories and will not be easily forgotten. By learning from those findings, the students can also learn to analyze and try to solve their own encountered problems, resulted in increased creativity and physical fitness of the students.

There is a significant increase in the creativity and physical fitness for the experiment group, while the control group has also found an increase in the creativity and physical fitness. The treatment was given to the experiment group as many as 16 sessions with a frequency of three times a week, during Monday, Wednesday and Friday. After then, from the data processing that researchers have found which was strengthened by the theories of experts as well, it can be concluded that there are significant influence from discovery learning model in physical education towards creativity and physical fitness for the class VIII middle school students of SMP Negeri 2 Indramayu.

Physical education with a scientific approach is affecting to the improvement of students' creativity. Physical education done with conventional approaches does not affect the improvement of creativity. Physical education carried out with a scientific approach is giving influence on the increase of the creativity of students, physical education conducted using scientific approach is giving influence on physical fitness, physical education done with conventional approaches do not affect the physical fitness of students in Cimahi and Cikalong, but in Cirebon area it has an effect, physical education conducted using a scientific approach has a better influence on creativity, concentration, physical fitness and intelligence level of students compared to conventional approaches [12].
In order to have the physical education and sport giving positive impact to the students, it is advisable to use the FITT formula which means: F = Training Frequency 3-5 times per week; I = Mild and moderate intensity zone training pulse (Target Heart Range): 50% - 70% x (220-Age); Time = period of doing sports activity for 30-60 minutes; Type = type which is the category of sports being done which is aerobic [11].

Exercising three times per week can affect the students' creativity and physical fitness. In this study, using the discovery learning model is proved to be better than conventional model. This is evidenced by the Independent Samples t Test to calculate the creativity which has the significance value of 0.00, meanwhile the physical fitness test using Mann-Whitney Test has the significance value of 0.000. This is in line with the goal of physical education which is to develop the whole being of a person, either a person as a creature of individual, social, and religious, and operationally aims to promote the growth and development of knowledge, cooperation, reasoning, emotional, sportsmanship, respect for differences, mutual help, skills, health, physical fitness and even in improving the development of intelligence.

4. Conclusion
Physical education done in coastal areas using scientific approach is affecting towards the improvement of the creativity and physical fitness of the students. Physical education done in coastal areas using conventional approach do not affect in the improvement of students’ creativity but has an influence in the improvement of physical fitness of students.

Physical education carried out using scientific approach is better than the conventional approach towards the creativity and physical fitness of students.

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