The Four-Net Game to Improve Students’ Psychomotor Skill

1st Adi Sumarsono  
Physical Education and Recreation  
Department, Faculty of Teacher  
Training and Education  
Musamus University  
Merauke, Indonesia  
adi@unmus.ac.id

4th Afif Khorul Hidayat  
Physical Education and Recreation  
Department, Faculty of Teacher  
Training and Education  
Musamus University  
Merauke, Indonesia  
afif@unmus.ac.id

7th Chyntia Novita Kalalo  
Physical Education and Recreation  
Department, Faculty of Teacher  
Training and Education  
Musamus University  
Merauke, Indonesia  
novita@unmus.ac.id

2nd Carolus Wasa  
Physical Education and Recreation  
Department, Faculty of Teacher  
Training and Education  
Musamus University  
Merauke, Indonesia  
gaspar_wasa@yahoo.com

5th Hendra Jondry Hiskya  
Physical Education and Recreation  
Department, Faculty of Teacher  
Training and Education  
Musamus University  
Merauke, Indonesia  
hendra.mustamu@yahoo.com

3rd Syamsudin  
Physical Education and Recreation  
Department, Faculty of Teacher  
Training and Education  
Musamus University  
Merauke, Indonesia  
sammymrq06@gmail.com

6th Emanuel Lewar  
Physical Education and Recreation  
Department, Faculty of Teacher  
Training and Education  
Musamus University  
Merauke, Indonesia  
juniorlewar@gmail.com

Abstract—Student learning outcomes at school can be grouped into cognitive, affective and psychomotor domains. The purpose of the learning process is always aimed at three domains, but the emphasis is different. Physical education in school includes the compulsory education taught in the School, which mimics the practiced motion activities. This study aims to produce games that are applied to physical education. The method used in this study was Research and Development (R&D) using five development steps. The results of four-net game research were specific to psychomotor training (motion skills) on a large ball game. Through the four net games, it could find the information provided by the students.

Keywords— net game, psychomotor

I. INTRODUCTION

A. Background

The purpose of physical education is, in addition to mastering sports techniques, to master the motion skills included in the form of games. Edginton, et al described that one of the physical education pedagogies is in focusing on content and methodologies to develop healthy active manifestations for children and youth. This requires the integration of skill development, physical fitness, health, nutrition and planning for leisure. Stated that the effective physical education program targets the development of physically fit cognitive task [1]. More rapidly and displays a pattern of neurophysiological activity. Indicative of greater mobilization of brain resources than less fit children. A good game model will certainly expedite learning process and make students get their learning outcomes improved, besides, students also gain new knowledge and experience [2].

One of the benefits of physical education by doing physical activities is to support academic achievement. Physical education shows that it does not have any negative impact on students' academic performance, even in female students, there is an improvement in math and reading scores in students who get higher scores in physical education [3]. Meanwhile, the opinion of [4] states that physical activity has an effect on the frontal lobe, an area of the brain for mental concentration and planning. CDC [5] states that physical activity through physical education helps shape and maintaining healthy bones and muscles, controlling weight, building muscles and reducing fat, reducing depression and anxiety, and preventing or slowing hypertension, as well as reducing blood pressure in some teenagers who suffer from hypertension. Fitness scores are significantly associated with academic achievement, both in elementary and high school students [6].

Every student in the learning process of physical education is obliged to do the type of motions taught by the teacher, that becomes the characteristic of physical education learning in which every student is obliged to perform tasks without being represented by other students. It is expected that every student can do every motion according to the teacher, that becomes the characteristic of physical education learning in which every student is obliged to perform tasks without being represented by other students. It is expected that every student can do every motion according to the teacher. This research is based on the needs of teachers in overcoming the problems that arise from the big ball game learning process by using the net games.

B. Literature Review

One of the characteristics of physical education at school is the involvement of students in doing the motion in
accordance with the material taught by the teacher. The material taught includes knowledge and evidence of activities that are submitted by each student. Physical education is education through a physical activity that focus on the achievement of all domains of learning objectives [6]. Explained that physical education was perceived as a unique means to promote the achievement of physical, motor, mental, and social objectives [7].

Learning theory says that in learning process, the outcomes are not always in accordance with the learning atmosphere. It is affected by methods, media and learning atmosphere. Meanwhile, the theory of motion learning to achieve changes in the quality of permanent skills is affected by natural and environmental factors. This is explained in human motor theory which is based on mastering the quality of manipulative motion, the automation must be learned from sequential basic motion techniques.

II. RESEARCH METHOD

This study used the research and development (R&D) method. This study was adopted from the development steps of Borg and Gall. The development steps in this study include; (1) needs analysis, (2) game drafting (3) draft validation and (4) final product. Needs analysis is based on the teacher's activities in teaching the big ball materials at school. 

Game drafting is a reflection of the study of needs in the learning process. The draft of the initial product is the game set in the form net. The draft of initial product of research and development is a modification that is adjusted to the area of field and the body height of students. The net is made in an elongated form and consists of four sides. The types of products that have been produced were then validated by experts by involving the experts of each game, motor learning experts and practitioners consisting of physical education teachers. The final step in the development was the making of the final product which consists of game equipment, rules and the type and size of the game.

III. RESULTS AND DISCUSSION

A. Needs Analysis

The results of the needs analysis obtained based on the results of observations are; first, the lack of teacher's knowledge in modifying the equipment that is still based on the knowledge of teacher who masters the game technique not modification; second, the physical activities taught have not resulted in the basic motions skills, as this is almost similar results of observation on learning materials; third, the limited facilities and infrastructures at different schools; fourth, the teachers are always busy correcting the students' movements without regard to students' mobility; and fifth, the domination of male students in the game caused the female students to passively wait on the court sides during the Physical, Sport, and Health Education subject.

B. Expert Validation

The product developed in this study has passed internal validation from experts in advance. The result of expert validation on the developed products is shown in Figure 1:

![Figure I. Expert Validation in the Aspect of Information](image)

![Figure 2. Expert Validation in the Aspect of Efficiency](image)

The results of the draft validation in this study highlighted two things, namely: the aspect of information and the aspect of efficiency. Based on the results, the average percentage is categorized as very feasible to use as the media in learning physical education, especially for learning big ball game.

C. Final Product

The final product is a four-net game which is used in learning big ball game as shown in Figure 3:

![Figure 3. The Four-Net Game Equipment](image)
The four-net game created in this research and development has four courts, each side of which is localized by nets on two sides and by lines on two other sides. Each line is separated into an extension of the court with a distance of 30 cm. This is consistent with the expert input that the line should be extended to the service line. The game court is shown in Figure 5:

![Figure 5. The Court of Four-Net Game](image)

The nets used in the four-net game consist of four nets joined in the middle. The net height in the installation at school can be adjusted to the body height of the students. The poles used to install the net are made of iron equipped with extension pad to stick the poles to the ground. The nets used in the four-net game can be seen in Figure 6:

![Figure 6. One-side view of the Net](image)

The four-net game uses four nets in one court that are joined to each other forming a cross. The height of each net varies. Starting from the lowest, the higher and the highest net. The court area used is the same as the length and width measured from the nets.

The four-net game is one of the modified games in overcoming the limitations of facilities and infrastructure that are experienced by almost all schools. In the four-net game, each team is on each side of the net and consists of 5 students. There will be 4 teams in the game occupies each side of the nets. The principle of this game is to keep the ball over the ground as long as possible. The technique used is almost similar to the volleyball starts with a server then the ball goes over the net to the receiving team any side and it is limited to only 3 touches without smash. Due to practicing a sense of honesty, there will be no referees on duty in this game, assuming that all players act as referees. Cooperation is made between players to make a decision to win the game. Another modification on regulations is if a student makes a mistake or intentionally gets the ball grounded, he will be ejected from the game. With the implementation of the game that have been done, it has been ascertained that the students’ (psychomotor) motion skills increase. The implementation of the four-net game can be seen in Figure 7:

![Figure 7. Implementation of Four-Net Game](image)

Description of the results of the development in this study is that the four-net game is suitable for use in the physical education learning process, especially for improving the psychomotor domain of students. The results of the implementation showed that the four-net game can improve students' motion skills through a challenging and fun game. The rules made and the equipment used in the game make students motivated to perform active and consistent motion tasks. In addition, based on the observations conducted, students are not only happy but also feels confident and can cooperate with their team members, while based on expert judgment, in terms of attractiveness, the product is feasible by being able to innovate through net modification on one side, the use of colorful materials adds another attractiveness of the product. The clarity of the rules made has been enough because it adds and reduces the existing regulations. The equipment has also been declared safe and environmentally friendly. As well as in terms of conformity with the curriculum at school, it is appropriate to implement the big ball game learning. Based on the results of the observation of validation above, the experts stated that the results of the development of the four-net game worthy to use as learning.
IV. CONCLUSION

Based on the results, it can be concluded that the four-net game model can be used in the learning process of Physical Education subject. The materials used in making the equipment of the four-net game are simple but can be applied to build the students’ motion skills as the solution to improve students’ psychomotor domain.

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