Physical Education Learning Media Based on Antropometrcis Mapping for SMP Students in West Java

E Nugraha*, H Firmansyah, S Mujianto, and D Budiana
Faculty of Health and Physical Education, Education Universitas Pendidikan Indonesia Jl. Dr. Setiabudhi No 229 Bandung

*ekafok@upi.edu

Abstract. The use of formal sports media tool always poses problems for students in teaching and learning physical education (PE). The research’s goal on the first year is to do mapping anthropometric for Junior High School (SMP) students in West Java as well as the suitability of the used of formal sports media on PE learning based on 2013 curriculum. The research method used in this study is analytical description. The data were collected through documentation and survey. The instruments were anthropometric data of SMP student and interviews with PE Teachers. The results show that the use of formal sport tools at PE learning PE does not match the learning outcome of students as well as anthropometrics mapping rules of ergonomics. Designed PE media learning is needed specifically in accordance with the rules of ergonomics, which is safe, comfortable, interesting, and in harmony with physical or psychological development for SMP student in West Java, Indonesia.

1. Introduction.
The issuance of PP no.19 of 2005 has changed the fundamental concept of “physical education” into physical education, sports, health (PSEH – PJOK in Indonesian). Although at first the model of physical education are taken from physical education (sport education) [1] [2], the concept of Physical education had been formulated by the Bureau of Physical Education in 1960, as “Education actualizing the potential of human activity in the form of attitudes, actions, and work by its form, content, and direction towards personal determination in accordance with the ideals of humanity” (Suherman, 2009: 4).

Government regulation no.19 of 2005 has an impact on the use of media/educational tool that should be in accordance with the concept of physical education itself. On the other hand the use of media/formal sports equipments used in physical education learning in schools will cause new problems for learners. The use of media/formal sports equipment formal on secondary schools, especially in class VII (seventh grade) has the characteristics and distinctive physical and mental development, which is not necessarily in accordance with the applicable rules of ergonomics. Media/formal sports equipment is made in accordance with SNI. They are reserved for official games that are tailored to the regulations of sports and their branches.’

The use of tools/formal media of sport in educational environments are still rife, because: 1). Availability of equipment/formal sport media, especially for teens and/early age in the market is difficult to find. 2) The strong public demand for PJOK teacher as coach, and even government...
educational institutions encourage high achievement in activities that are less precise (O2SN activities, KU Championship on sports and their branches, Popnas, etc.)

The use of tools/formal sport media on curriculum 2013-based PJOK learning has not been studied in depth, considering the use of tools/formal media sport which owns SNI was not planned and created specifically within the specification of tool/media education for specific age groups and certain specialties. The research problem at stage 1, which is: "how appropriate the use of tools/formal sport media is in anthropometric mapping of junior high school students in West Java”.

2. Research Method.
The method used in this research is analytic descriptive with anthropometricc data collection, as well as special interviews with physical education, sport, and health teachers (PJOK) about the use of tools/formal media sports in physical education learning at school. Reasons of using this method is based on the study itself, conducting the anthropometric mapping for modelling the ergonomics media/learning tool purpose.

The population in this study were all junior high school students in the capital cities/regencies in West Java, while the samples in this research were selected students from one (1) class VII that were chosen randomly. Instruments used in this survey were standard anthropometric data measurement that was adjusted to the needs of this research, as well as special interviews with teachers of PJOK/Physical education, Sports, and Health associated with the use of formal sport media in PJOK learning.

3. Results and Data Analysis.
Based on interviews and documentation for Junior High School teachers of PJOK in the capital city/regencies of West Java, 95.5% of PJOK teachers still use tools/formal sports media, for reasons as noted earlier.

The anthropometric measurements were adjusted in terms of the use of instructional media on PJOK learning. The literal meaning of anthropometric itself represents two words, ‘man’ and ‘measure’, referring to the measurement of the human individual and early tool of physical anthropology. Anthroopometry involves the systematic measurement of the physical properties of the human body, primarily the dimensional descriptors of body size and shape [3], among others:

- Height / Weight body: measurement to get whole standard of BMI (Body Mass index), as an index picture of students’ body time index
- High sit and Long leg: Measurement standard to compare students’ body proportion body, related to the bouncing of a ball that can be anticipated by students.
- open and closed palm of hand: Measurement standard to learn how wide a grip can do, related to the gripping ability of arms with manipulative objects/ideal ball.
- Circumference head: this measurement done to gain students’ head time indicator, related to impact caused by the bumping of manipulative objects time with students’ time head.

Based on the results of anthropometic mapping from 1018 samples of seventh grade junior high school student in West Java, the data obtained in Table 1 as follows:
### Table 1. Average anthropometric mapping data of seventh grade junior high school student in West Java

| Age   | BW   | Height | High sit | Length of limbs | Length of sleeves | Head circumference | palms closed | Open Palms |
|-------|------|--------|----------|-----------------|-------------------|-------------------|--------------|------------|
| OVERALL AVERAGE | 12,11 | 45,22  | 150,28   | 74,80           | 75,42             | 53,24            | 49,04        | 11,96      | 14,07      |
| AVERAGE OF MALE STUDENTS | 12,13 | 45,09  | 150,84   | 74,62           | 75,31             | 53,31            | 50,93        | 12,23      | 14,48      |
| AVERAGE OF FEMALE STUDENTS | 12,09 | 45,36  | 149,71   | 74,97           | 74,97             | 53,17            | 47,16        | 11,69      | 13,66      |

Examples of formal basketball specifications, which complies with SNI standard no. 1282:2009, in table 2.

### Table 2. Quality requirements of basketball (adopted from SNI, National Standardization Agency 2001).

| Type of test | Unit | Requirements | Information |
|--------------|------|--------------|-------------|
| State of the valve | Not prominent | At a pressure of 0.4-0.69 kg/cm² (0.39-0.65 bar). The beginning of ball pressure 0.54kg/cm² |
| The ball pressure | Kg/cm(bar) | Min 0.5 (0.49) | |
| a. Ball circumference | Cm | 74.9-78.0 | On ball pressure 0.40-0.69kg/cm² (0.39-0.68 bar) |
| Ball no. 7 | 72.4-73.7 |
| Ball no. 6 | 68.8-73.0 |
| Ball no. 5 | < 1.5 |
| b. Roundness | | |
| Heavy | Ball no. 7 | Gram | 567 - 650 |
| Ball no. 6 | 5.10 – 567 |
| Ball no. 5 | 460 – 500 |
| Rebound ability | Cm | 120 -140 | At the same ball pressure at above if dropped from a height of 180 cm. |

If we compare the two tables above, observed based on the concept of ergonomics, “it is necessary to think that all the equipment was adjusted to the anatomical and physiological conditions of children, for their safety and in order to develop their maximum skill. [3] [4] Strengthened by ‘Sport’ achievements’ starting from young children and adolescents are now ... for the application of children ergonomics (paediatric ergonomics). It should be understood that children are not miniature of adults but they will grow, develop appropriately on their own [4], related to the use of physical education sphere advantages of “equipment and facilities (physical education) will increase the ability of student learning, make the learning environment becomes more secure, and balance between the issues of learning and the centre of attention. (Thomas, Lee & Thomas, 2008: 330-313, related to the equipment for beginners) “To start the ball must be slow and bounce kindly-sponge balls satisfy the requirement [5] so the development of tools/media learning should be in accordance with this ergonomics rules. Ergonomic itself, ergonomics (or human factors) is the scientific discipline concerned with the understanding of the interactions among human and other elements of a system, [7] [8].
If you want an improved learning PJKO to the fullest, it requires careful thought, associated with the opinion of some experts, both from the substances/materials used for appropriate learning media, suitability with the right mapping anthropometric, also the functioned standard that is easier to be manipulated by students, as well as safe and interesting to wear.

4. Conclusion

Based on the analysis of data and development of the existing theory, the use of tools/formal sport media in curriculum 2013-based PJOK learning and the results anthropometric mapping surveys of junior high school students in West Java, it’s concluded that the use of the media/formal sports equipment in PJOK learning is not proper in accordance with applicable rules of ergonomics.

Tools/special physical education instructional media are needed to be designed in accordance with the rules of ergonomics. A good, safe, comfortable and attractive model of media learning that is in harmonious growth of physical and psychological development for junior high school students in West Java in particular and Indonesia in general

References

[1] D. Siedentop, Developing teaching Skill in Physical Education, Mayfield: Mayfield Publishing Company, 1991.
[2] M. W. Metzler, Instructional Models for Physical Education, Arizona: Holcomb Hathaway.inc, 2005.
[3] S. Giriwijaya, Ilmu faal Olahraga, Bandung: Rosda Karya, 2013.
[4] T. Reilly, ergonomic in Sport in sport and Physical Activity, unite state america: www. human kinetic, 2010.
[5] R. Thorpe and David Bunker, Landmarks on Our Way to teaching for Understanding, -, -, 1987.