

## **The Role of Sport and Health Laboratories in Developing the Insights of Sports Science and Technology Towards Faculty of Sport Science Students**

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### **Abstract**

The present research aims to analyse the role of sport and health laboratories in developing the insights of Sports Science and Technology towards Faculty of Sport Science students in Universitas Negeri Semarang (FSS Unnes). The research conducted by using qualitative approach and ethnography design with critical ethnography type. Data sources collected from research informants by using Purposive Sampling and Snowball. Data collection technique used observation, interview, and documentation study. Data analysis used inductively by using Miles and Huberman interactive cycle. The results show that The Role of Sport and Health Laboratories of FSS Unnes in developing Sports Science and Technology towards sport science students indicated *quite maximal* contribution, with the sport and health laboratories provided in FSS Unnes, students could directly apply the materials they learned during lectures, they also could have skills to evaluate athletes' training programs, regulate the pattern of good nutritional intake for athletes and apply technology in physical education and other sport sciences.

**Keywords:** Role, Sport and Health Laboratories, Knowledge, Insights, Sports Science and Technology, Students

## Introduction

Recently the revolution of science and technology have got the most important place in Physical Education and Sport Science field which become the integral part of the physical education teacher's work in delivering materials and also sport practitioners including athletes, coaches and sport managers (Kocak, 2003; Liang et al., 2006). In some physical education and sport science faculties, technology equipment is increasingly used for learning and research purposes. For instance, after graduating from university and work in some sport institutes, students are expected to be able to computerise hardware and software in knowing physiology and anatomical components in athletes (FitzPatrick, 2004), and understand the application of conceptual learning and motor skills in schools that use various multimedia provided in elite schools (Antoniu, et al., 2003; Kirkwood et al., 2002; Wiksten et al., 2002). Furthermore, physical education and sport science students are expected to use automatic software to analyse statistical data to do given tasks so that they will obtain accurate and valid data (Shiffett et al., 2001).

In the scope of physical education, the technology in current era can be used by PE teacher in efficiency and improving students' learning, for example, PE teacher can use multimedia software to teach sport skills through videos (Vernadakis et al., 2002), use computer hardware to monitor students' pulse in evaluating their physical fitness (Liang et al., 2006) and use hardware and software to display video in analysing students' ability to move (Thomas and Stratton, 2006). Thus, it is clear that in university with department of physical education and sport science, graduate students have to have scientific and technological skills in order to utilize the technologies for learning and research purposes and prepare their professional careers in the future so that they can solve emergency problems (Papastergiou, 2010).

Form the phenomena, universities in Indonesia that have sports major entering this disruption era face complicated, complex responsibilities and missions, if it is related to expectations imposed Sports Development Strategy to university of sports by Indonesian sports community. Unsupported science and technology in sport is always being the reason of contingent failure.

Indonesia is in multi events arena, such as SEA Games Olympics, etc. It is quite reasonable if it reflects to countries that the sport development is developed such as China and South Korea. Styobroto (1993:12), states that the success of China cannot be separated by the supports of science and technology and many researchers and scientists from National Research institute of Sport Science (NRIIS) Beijing. However, a progress of a nation in any field including sport achievement cannot be separated from the contribution of its universities' quality (Dimiyanti, 2001).

Faculty of Sport Science Universitas Negeri Semarang (FSS Unnes) is an educational institution and educational personnel in the field of sports science in Central Java, Indonesia. In the framework of conservation vision in sport and health, this institution performs several tasks, including: 1) developing human resources in sport, 2) developing sport science in research and community development, 3) making sport works with community needs, 4) developing sport study centre, 5) developing cooperation at the regional, national and international levels, and 6) playing a role in national sport development though science and technology.

By performing the visions and missions, FSS Unnes trying to realise: 1) Graduate students who are devoted to God Almighty, virtuous, dignified, and responsible. 2) Graduate students

who are competent in Physical Education, Health, and Recreation, Sport Coaching Education, Sport Science, and Public Health Science. 3) Graduate students who are skilled, independent and capable of high competitiveness in the global world. 4) Graduate students who develop themselves in research and community service for the benefit of society.

To realise the visions and missions, FSS Unnes is demanded to always know and absorb what is developing in community, especially people around FSS Unnes, either in sport or health. Therefore, learning, research and community service must be in accordance with community development and needs. To play the role and facilitate the program activities, facilities and infrastructures must be prepared as supporting tools in FSS Unnes. The results of a research by Setiawan, et all (2017) show that the prerequisite of sport and health laboratories in FSS Unnes were already at quite maximal level, it was based on technical standards from equipment, personnel, condition of accommodation and environment, test and measurement, quality assurance of measurement and test results to result reports that referred to ISO 17025 or SNI 17025 standar. The certified sport and health laboratories will be the superior especially in university level and generally in Central Java. Furthermore, they can also give the role which develop students' insights more in sports science and technology.

The existence of laboratory is one of the spearheads of a university and the laboratory progress is also one of the benchmark assessments of a university. It is one of the strategies for development of quality improvement, relevance and competitiveness. The definition of laboratory in general is a place where experiments and investigations are conducted (Nuryani, 2003:163). Richardson (1957:70) states that laboratory is very important because it has various functions including: 1) it can cause various problems to be solved, 2) it is a good place for students to conduct experiment, perform exercise and demonstration or other methods, 3) it can cause students' understanding and awareness on the role of scientists, 4) it can cause students' understanding and awareness on facts, principles and generalisations, 5) it gives opportunities for students to work with certain materials and tools, cooperate with their peers, be motivated to reveal, find and feel satisfied with the results they obtain, 6) it pioneers the development of good attitude, habit and skill.

According to Sundari (2008), the aspects of skill that need to be assessed while students are performing laboratory activities are: 1) cognitive aspect, performed by written and oral test, 2) affective aspect such as discipline work, creativity, persistence, honesty, cooperation, and leadership, 3) psychomotor aspect which aims to measure the extent to which students understand the concepts and apply them in experimental techniques, especially in the use of tools and materials, data collection, data clarification, data generalisation, prediction, and conclusion.

Based on the background, the present research aims to: 1) Analyse the role of sport and health laboratories in developing the insights of Sports Science and Technology towards FSS Unnes students.

## **Materials and Method**

This research was conducted by using qualitative approach and ethnography design with critical ethnography type. (Creswell, 2012:476). This research was conducted to analyse, study and review the implementation of policy and improve the implementation in sport and health laboratories in FSS Unnes. In this terms, the press point is to find out the contribution

of sport and health laboratories in developing the insights of Sports Science and Technology towards Faculty of Sport Science Semarang State University students.

The sources of data in this research consisted of primary and secondary data. Primary data was collected by interview and observation process in sport and health laboratories FSS Unnes, while secondary data was from documentation analysis study. The sources of data were obtained from the research informants by using Purposive Sampling and Snowball technique.

The instruments used in this research were 1) The interview guidelines on interview data collection technique, 2) The observation guidelines on observation data collection technique, and 3) Check list blank on data collection technique of documentation study, the supporting media used tape recorder, camera, and note book. To collect primary data for this research, there were three kinds of data collection technique: 1) Direct observation, 2) Semi-structured interview, 3) Documentation study or documentation searching and documentation in the form of archives used as the supporting data or secondary data. The validity of data in this research was investigated by triangulation technique and reviewing the sources of the data. The triangulation techniques used by the researcher were technical and source of triangulation.

Data analysis used in this research was based on the interactive analysis model developed by Miles and Huberman (1984) in Sugiyono (2015:534). Processing and analyzing data consisted of 4 interactive components 1) Data Collection, 2) Data Reduction, 3) Data Display, and 4) Conclusion/Verifying. Data analysis was done during data collection process. Data reduction was done by summarizing data into some pre-defined categories. This division used coding method. Data display was done by using brief description, table, or diagram. Table and diagram were based on the pre-defined categories.

## Results

### *The conditions of Sport and Health Laboratories in Faculty of Sport Science Universitas Negeri Semarang*

Based on the observation and document searching, the physical conditions of Laboratories had these specifications:

- 1) Surface Area : 7.641.58 m<sup>2</sup> with details of land use as follows:
  - Public access zone : 685 m<sup>2</sup>
  - Sport Lab. : 3.818 m<sup>2</sup>
  - Physical Examination Lab. : 882.72 m<sup>2</sup>
  - Public Health Lab. : 895.68 m<sup>2</sup>
  - ICT Centre : 815.18 m<sup>2</sup>
  - Calibration Lab. : 545 m<sup>2</sup>

From the physical conditions above, the laboratories could support the activities in the laboratories, it was based on the standard rates of open space adopted by Olympic Committee that every person was given 3.5m<sup>2</sup>/person to do activities related to sports in order to be comfortable. However, based on the results of interviews with students, lecturers, coaches, and sport observers element, it was explained that the space in Sport and Health Laboratories

of FSS Unnes was still less widespread so that the space for athletes to do test and measurement would be flexible.

From the aspect of tools, Sport and Health Laboratories FSS Unnes had 36 types of tool for athletes' test and measurement. The tools had good capabilities, needed to be repaired, and dysfunctional/broken, however most of the tools were still good. The tools of a laboratory should be able to facilitate and accommodate athletes' needs in order to find out their potentials based on the standard noted in ISO 17025 or SNI 17025. However, based on the interviews with students, lecturers, coaches and sport observers element, it was explained that the tools in Sport and Health Laboratories in FSS Unnes needed to be repaired and added more tools but the quantity and quality of the tools should be considered in order to make the implementation of learning efficient. Not apart from the norms of athletes' skill measurement to be met, each measurement tool should be equipped with SOP (Standard Operating Procedures) in order to make the users feel easy to used them and also provide comfort and security. Based on the observation of tools in Sport and Health Laboratories FSS Unnes already had SOP for each tool.

### ***The Role of Sport and Health Laboratories in Faculty of Sport Science Universitas Negeri Semarang in Developing the Insights of Sports Science and Technology Towards Students***

Based on the results of observation and interviews, the use of laboratories performed to develop the insights of Sports Science and Technology for students was by learning given in courses. Learning process performed by using practical and theoretical method for 2 Semester Credit Unit (in Indonesian *Satuan Kredit Semester* – SKS) in each course provided. In learning, the lecturer will direct students to try several tools.

The Role of Sport and Health Laboratories of FSS Unnes in developing Sports Science and Technology towards sport science students indicated ***quite maximal*** contribution, with the sport and health laboratories provided in FSS Unnes, students could directly apply the materials they learned during lectures, they also could have skills to evaluate athletes' training programs in Central Java in order to be better and regulate the pattern of good nutritional intake for athletes.

However, in between the roles which were quite maximal, there were problems faced by sport and health laboratories of FSS Unnes in order to develop the role to be maximal until it reaches very maximal, including 1) Unnes should improve governance of laboratories because students, lecturers, coaches, and sport observers element considered that the space was less widespread, it means that the laboratories should be expanded and 2) There were many dysfunctional tools. From the observation, interview and questionnaire process by students, the tools were incomplete and resulting in efficiency and effectiveness of the implementation of test and measurement practices in lectures became less optimal.

The obstacles of sport and health laboratories of FSS Unnes needed to be developed in order to be very maximal were firstly, the land or area which could be used to expand sport and health laboratories of FSS Unnes was still too narrow and secondly the fund used to develop sport and health laboratories of FSS Unnes to add tools was still minimum because to have good quantity and quality of tools required a lot of funds.

## Discussion and Conclusion

As one of centres of excellence in their respective areas, university is expected to be able to encourage the mastery of science and technology through education, research and community service. Through the *Tri Dharma* (three principles of higher education) of university, it is expected that university is able to be innovator and dynamist in order to respond to various changes occur in society.

The research results describe how important the role of sport and health laboratories had by each university who was implementing study program of physical education and sport science. The role of equipment inside the laboratories was able to give an experience for students in technological field, so that after they graduated they would have skills in technological application of physical education and sport science.

The application of learning in lectures by introducing students with technology based test and measurement tools is a significantly positive and influencing strategy to make graduate students be able to adjust to the development of more advanced times, so that they get career professionalism in the future in physical education and sport science (Torkzadeh et al., 2006; Chen, 2004; Martin and Dunsworth, 2007).

However, in terms of accommodating students with various experiences in technology of physical education and sport science should always be monitored and evaluated in learning process so students who are basically have slow abilities will not feel less confident. Further, the application of technology should not only be perform in lectures but also outside of study hours, such as conducting training and workshop of physical education and sport science (O'Neil, 2006). The Impacts of technological advances do not always provide positive but negative contribution, for example spreading fake news via social media, and can give addiction effect which makes students lazy. Therefore, controlling and reflecting to students in lectures are needed (Durndell and Haag, 2002; Ertmer et al., 1994; Hsu and Chiu, 2004; Sam et al., 2005).

It can be concluded that the role of Sport and Health Laboratories of FSS Unnes in developing the insights of Sports Science and Technology towards students have been played well and given quite maximal contribution, however there were problems and barriers including 1) Unnes should improve governance of laboratories and expand them and 2) There were many dysfunctional tools so that they can decrease the effectiveness and efficiency of lectures for students.

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## Conflict of Interest

The authors have not declared any conflicts of interest.



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