SCIENCE LABORATORY MANAGEMENT: STATE OWNED JUNIOR HIGH SCHOOL SEMESTA SEMARANG

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That is One of Prerequisite for Successful on Educational Management,
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Abstract

The objectives of this study are three objectives of this study (1) this study are to describe setting of Science laboratory room; (2) this study are to describe characteristic of Science laboratory material management; (3) this study are to describe the satisfaction of using the Science laboratory.

It is a qualitative research using ethnography design. The informants are the principal, teacher, and student. Technique of data collection uses observation, interview, and documentation. Method of data analysis uses data collection, data reduction, data display, and conclusion. Data validity of this research includes credibility, transferability, dependability, and conformability.

The results of this study there three subjects are (1) Designing of Science laboratory room at Junior High School Semesta Semarang has been relevant to the standard of laboratory management. Science laboratory has several rooms such as a room to store practicum tools which is located in the back of the room. The tool storage room measuring 3 m x 10 m, with a door to enter and exit the room. The arrangement of tables and chairs in the Science laboratory is tailored with the need of teaching and learning process. There are a white board and LCD in front of the laboratory room. There are 24 windows and four sinks in the Science laboratory of Junior High School Semesta Semarang. There are no fire-extinguisher and P3K box in the Science laboratory of Junior High School Semesta Semarang. (2) The management of Science laboratory at Junior High School Semesta Semarang is done based on the educational system applied that is moving class where students stay on their classroom based on the subject to be followed. The reference books are collected from Indonesian and Turkey. The reference books are stored in cabinet located in the back of the Science laboratory room. (3) The satisfaction of using Science laboratory is influenced by the completeness of available facilities and infrastructure in a laboratory room. The facilities and infrastructure include practicum room, and storage room of practicum tools. Tools in the laboratory are stored in the glass display cabinet in order to facilitate teachers to control it. The available of ventilation in a room is urgently needed to help the air circulation in the room. The sink in the laboratory is very helpful for students when the practice is finished.

Keywords: room setting, material, Science laboratory
Background

Depdiknas (2006), Science is associated to the way to know the nature systematically, so Science is not only a mastery of knowledge in the form of facts, concepts, or principles but also the process of discovery. Science education is expected to be the vehicle for students to know themselves and the environment, and the prospect of further development in applying it to the daily life.

The learning process emphasizes on providing direct experience to develop competence in order to explore and understand the environment scientifically. Science education is directed to inquiry and to do something that assist students to gain more understanding about the environment.

In Science learning, the use of laboratory or experiment activities is part of teaching and learning process. Through experiment activities, students will prove the existing concept or theory and can experience the experiment process itself and then make the conclusion so it can support students’ understanding of the materials. In this case, if students more understand of the material, their learning outcome is expected to be increased.

Management is a process of utilization of resources effectively and efficiently to achieve the expected goal optimally by considering the sustainability of resources functions. Sagala (2006) defines management as a process to plan and maintain the environment where individual can cooperate in group efficiently to achieve the goal (p. 18).

As bilingual school, Junior High School Semesta Semarang has complete facilities to support teaching and learning process at school. The facilities include language laboratory, Science laboratory, library, big classroom, and others. The Science laboratory assists students in teaching and learning process both for practice activity and delivering of material. It can be seen from the students who always become the winner of Physic competition in the school level, national, and international level such as physic competition at Turkey.

Based on the above background, the researcher is interested in conducting a research entitled “Science Laboratory Management: A Site Study at Junior High School Semesta Semarang.”
Science Laboratory (IPA), In Science education, laboratory activities are the integral part of teaching and learning activities. It shows the important of laboratory activities to achieve Science education goals. In the Science education context such as biology, it is a place or building which contains tool and material for biology learning. The laboratory functions to help students build knowledge of natural phenomena and develop life skill through scientific activities to get generalization or conclusion in the form of scientific explanation. Kinds of Science laboratory facilities include layout space, meubelair, research tool and learning which are needed to support learning. Introduction, use and basic technique works in laboratory such as the introduction, empowerment, maintenance of practical tools and materials, and the ability to operate certain equipment such as using thermometer, microscope and other tools. The work safety and security in the laboratory consist of things that must be done before, along, and after work in the laboratory; basic technique of work safety such as handling hazardous material, glassware, mechanical, electrical, and biological (wild animal and plant) (Alit, 2007, p. 4-5).

Management of Science Laboratory, The concept of Science Laboratory Management, TIM (2004) described management is the process of planning, organizing, directing, monitoring the efforts of organization members that have been set (p. 2).

Laboratory Design, a laboratory that full of equipment can not be used effectively if it is not designed properly. The proportional design will facilitate practical activities that impact to the achievement of goal as being expected (Anonim, 2010, p. 7). According to the writer, designing of a laboratory is very helpful to users when in the laboratory room. It is because the proportional room arrangement will facilitate teaching and learning in the laboratory.

Material Management, Practicum provides an opportunity for students find the theory and prove it (Sugiarto, 2008, p. 3). In addition to giving the opportunity for students, practicum in Science learning also can make illustration for Science concept and principles. From those activities can be concluded that practicum can support students’ understanding toward material.
User Satisfaction, customer satisfaction is a condition where the desire, expectation, and need of the customer are fulfilled. A service is considered satisfactory if it can meet customer’s need and expectation. Measurement of customer satisfaction is the important thing in providing better service, more efficient and effective. If the customer feels dissatisfied with the service, it means that the service is not effective and efficient. This is particularly important for public service (Triatmojo, 2006, p. 1).

According to the writer, the satisfaction of library user is very important because when the users are satisfied with all laboratory facilities, they will be comfortable and fun to come to the laboratory.

Zarghami and Schnellert (2004) entitled “Class Size Reduction: No Silver Bullet For Special Education Students’ Achievement”. They examined the effect of class size reduction on special education students. The research result is that no single best way to determine appropriate class and group size for special instructional programs and services; however, the existence of well-qualified teachers proved an important factor in increasing student achievement.

Schlautman and Silletto entitled “Analysis of Laboratory Management Competencies in Nebraska Agricultural Education Program.” It uses a qualitative method about the teacher’s competence to manage class and critical student’s behavior toward the positive educational result. Teachers need a preparation and develop their professionalism in the effective classroom organization. The competence to manage student’s behavior gives impact on the quality and indicator of education achieved.

Othman Talib (2009) in his research entitled “Uncovering Malaysian Students’ Motivation to Learning Science”. It is acknowledged that good science learning outcome does not only rely on the way teaching is carried out but also on other factors such as students’ ability and talent, language proficiency, and the right attitude toward science learning, just to name a few.

Andres Dewayne R (2008), on his research entitled “Management Strategies Help to Promote Student Achievement”. This research aims to describe about the important of management to assist students in improving their
achievements. The findings are teachers must be more creative in creating a comfortable classroom environment to make students feel comfortable and give more concentration in following learning process. It aims to make students more understand toward the material taught by teachers so it is automatically that students learning quality more increased.

This study has a focus on managing Science laboratory at Junior High School Semesta Semarang. The focus is described into three subfocuses: 1) How are characteristic of Science laboratory room setting? 2) How are characteristic of Science laboratory material management? 3) How are characteristic of the satisfaction of using Science laboratory?

There are three specific objectives of this study: 1) Describe setting of Science laboratory room; 2) Describe characteristic of Science laboratory material management; 3) Describe the satisfaction of using the Science laboratory.

Method

A research entitled “Science Laboratory Management” is done at Junior High School Semesta Semarang. The reason for choosing the location is due to this school has a good laboratory room design.

Data are writings and record of everything that is heard, seen, experienced and even thought by the researcher during collecting data and reflect it into ethnography. Lofland (as citied by Moleong, 2006) stated the main data sources in qualitative research are words and actions, the rest are additional data such as document and others (p. 57). Data used in this research are data about the Science laboratory management at Junior High School Semesta Semarang.

Data sources of this research are the principal, teachers, laboratory assistant and students of Junior High School Semesta Semarang. Data can also be gained from data about the laboratory management from Science teacher who becomes the laboratory assistant at school when the researcher conducted observation at Junior High School Semesta Semarang.
In qualitative research, informant is not called as the research subject because data source involves people that act as the key person or the competent person. The informants of this research are the principal, teachers and students.

In-depth interview is intended to get a clear overview about what is said, thought, felt and what is known by the person interviewed. With the interview method, the researcher not only gets data but also can directly interact to subject so can reveal the answer freely and deeply. In-depth interview is done toward the principal, teachers, laboratory assistant, and students. Interview is done to get data about the Science laboratory management at Junior High School *Semesta Semarang*.

Documentary study is a supplementary of using the observation and interview methods in qualitative research. Documents collected are selected according to objective and focus of problems. Documentary study in this research is in the form of data in the school related to Science laboratory management at Junior High School *Semesta Semarang*.

Credibility Test, Sutama (2010) stated that to test credibility of findings in the field Guba further suggested three ways, namely extending the time stayed in the field to get a chance to expand the scope, do more observation to give the researcher an opportunity to experience it more, and to test the findings with triangulation method as have been suggested by Denzin with four triangulation modes, including the use of (1) multiple sources, (2) dual method, (3) multiple researcher, and (4) difference theories (p. 71).

Transferability Test, Sutama (2010) stated that the result of qualified social research is also supported by its change or ability to be applied in various condition and setting of time, place, and different context. When the researcher conducts a research, it is of course he does not know whether his findings can be applied on other condition or no (p. 72). Therefore, transferability test of a research needs to be done by other people that have learned the researcher’s report. To make the people can get a clear overview of the research the researcher needs to explain the background and the scene of the field where the phenomenon occurred and studied by the researcher. Social culture and values that exist in the
research field are important to make the report readers can conclude transferability of the research.

Confirmability Test, Sutama (2010) stated that naturalistic paradigm suggests the use of term “confirmability” that is the degree of certainty. Confirmability must be able to ensure that the research results are the determination and far from contradictory things. Confirmability needs to be supported by “audit trail” which also tests the dependability of research. If the dependability is more oriented on the process, the confirmability is more oriented on the research results (73).

**Proposition**

Teaching and learning process can be run effectively if the laboratory room designed in accordance with the needs of laboratory, so students and teachers feel comfortable when they are in the lab. With the provision of relevant material which lesson plan, the basic competence and standard competence can be achieved well. Therefore, students more the understand the material taught by teacher. With the good design of laboratory room, it makes the users are satisfied. It is seen from the users enthusiasm when in the laboratory.

**Discussion**

Science laboratory is a place for students and teachers finding and solving Science problems. In the laboratory, students and teachers conduct observation of the natural objects or experiments. As a learning place, laboratory generally has infrastructure that support teaching and learning activities in the laboratory.

In addition to the complete facilities, designing of the laboratory room by teachers gives more assistance for teaching and learning activities in the laboratory. Therefore, it is needs a good management in the arrangement. The purpose is to make the activities in the laboratory can run effectively and comfortable, facilitate the access from one room to another room, facilitate teachers to control, maintain the equipments and work safety.

Based on observation which was conducted by the researcher in the Science laboratory showed that Science laboratory at Junior High School *Semesta*
Semarang has several rooms such as equipment storing room. It is to facilitate teachers to control students when conducting practicum in the laboratory. The practicum equipments are stored in cabinets placed next to practicum room which are separated with glass. The equipment storage room large is 3 m x 10 m with a door to get in and get out of the room.

Arrangement of chair and table in the laboratory is tailored to the need in the teaching and learning process. Generally, table and chair are arranged to facilitate teachers to control students and not to interfere them to learn. Teacher’s table and chair is placed in front of students near the black board.

Based on the observation which was done by the researcher it showed that teacher’s chair and table is placed in front of students’ chair and table. There are black board and LCD in the front of Science laboratory.

The existence of adequate ventilation in the Science laboratory is very helpful for the air circulation. Air circulation can be a window and fan which usually set in the ceiling of Science laboratory room.

Observation that was conducted by the researcher showed that in the Science laboratory of Junior High School Semesta Semarang has good ventilation that is from 24 windows. It also has two big fans in the ceiling of the room.

The next important facility in the Science laboratory is a place to wash the practicum tools. Based on the observation and documentation, it showed that the Science laboratory of Junior High School Semesta Semarang has had a place to wash practicum tools or known by the sink. There are four sinks which are located in the middle of the room between students’ table and chair.

A laboratory room must have a fire-extinguisher and P3K box. The fire-extinguisher used to extinguish the fire when the surge of electricity occurred during the practicum activity. While P3K box is needed when students get any accident during the practicum.

Observation that was conducted by the researcher showed that the Science laboratory of Junior High School Semesta Semarang do not have Fire-extinguisher and P3K box in which it is so needed in a laboratory.
Characteristic of Science Laboratory Material Management.

There are three Science subjects- biology, physic, and chemistry. For Secondary School only get biology and physic subject due to chemistry is taught in the high school level. Science learning is always related to practicum activity in the laboratory which is planned in the lesson plan.

Teaching and learning activities for Science subject are held in the laboratory both for delivering the material and to do experiment. That is because the educational system using moving which is a class used for teaching and leaning activities where students have a class based on the subject to be followed. But in the implementation is based on the lesson plan which is created before.

According to the syllabus and lesson plan, teaching and learning activities for Science subject can be the delivery of material. To support the subject matter delivered by teacher, generally the school provides a reference book to add students’ knowledge about the material to be taught. The reference books are from the country and overseas.

Based on the observation that was done by the researcher in the field, it showed that Junior High School Semesta Semarang has many reference books, especially for Science subject. The references are derived from domestic and overseas such as Turkey. It is because Junior High School Semesta is an International School which cooperates with Association of Pasiad Turkey.

Reference books used by teachers generally stored in the library to keep it well maintained. But sometimes it is also stored in the Science laboratory to make students easy to use it during the lesson without taking to the library. The books are stored in cabinets near the practicum equipments cabinet.

Observation in the field showed that there are several reference books in the Science laboratory at Junior High School Semesta Semarang. The books are stored in the cabinets which located in the back of the Science laboratory space. Several books are published from Indonesia and others from Turkey.

The subject matter delivered in the Science laboratory of Junior High School Semesta Semarang are all subject matters. Due to this school uses moving
class system, students have classroom based on the subject to be followed. So for Science subject, they will be in the Science laboratory.

For the subject that requires a practice can provide an opportunity for students finding theory, and prove it. Practicum activity in Science learning can make illustration for Science concept and principle. From those activities can be concluded that practicum can support students’ understanding of the subject matter.

By implementing the practicum activities in the Science learning, it can make illustration for the Science concept and principle. Practicum activities also can support students’ understanding of the material due to it helps students to know whether their learning basic competence has been achieved or not.

Teachers of Junior High School Semesta Semarang who conduct practicum activities also consider the basic competence to be achieved by students. it can be seen from the indicators which were showed by students after doing practicum.

Based on the interview, it can be known that the practicum at Junior High School Semesta Semarang is to achieve the basic competence in the lesson plan. It also can help students to understand the material that has been or beng taught by a teacher.

**Satisfaction of Using Science Lab**

The completeness of available facilities and infrastructure in a laboratory room are very helpful for students and teachers as the users no exception for Science laboratory. Due to the availability of facilities and infrastructure gives much support to the process of teaching and learning in Science laboratory. The facilities and infrastructure are also arranged well to facilitate students who will use it.

After the practicum room and the room to store the equipments are separated then it needs a place to store practicum equipments. The equipments are stored in cabinets to keep it well maintained. Equipments in the Science laboratory of Junior High School *Semesta Semarang* are stored in the glass display cabinets that facilitate teachers to control it. Due to being stored in the glass display cabinets, the equipments can be seen from outside.
The arrangement of tables and chairs are aligned with the position of the board and LCD screen. It is so useful for students when in the Science laboratory room. The chairs and tables can be moved when conducts a discussion for the material being taught because if it is arranged permanently, the teaching and learning process will seem monotonous and it can make students feel bored.

Chairs and table in the Science laboratory of Junior High School Semesta Semarang are arranged parallel to the board and LCD screen placed in front of the room. Tables and chairs can also be rotated to facilitate the students and teachers when conducting discussions.

Ventilation in a room is urgently needed to help the air circulation in the room. As the observation that was conducted by the researcher in the Science laboratory of Junior High School Semesta Semarang showed that there are 24 windows in the laboratory rooms. According to the principal, many windows in the laboratory can help the air circulation and the lighting in the room.

Based on the above data, it can be concluded that many windows in the Science laboratory give many benefits such as good air circulation and lighting. Although do not turn on the lamp, the room is still bright.

The other Science facilities that give benefit in teaching and learning process is a place to wash practicum equipments or sink. A large number of sink in the laboratory is very helpful for students due to when they scramble or stand in line to wash the practicum tools, it needs more time.

The number of sink in the Science laboratory of Junior High School Semesta is varied. There are two sinks for Physic laboratory and four sinks for Biology laboratory.

Conclusion

Designing of Science Laboratory, designing of Science laboratory room at Junior High School Semesta Semarang has been relevant to the standard of laboratory management. Science laboratory has several rooms such as a room to store practicum tools which is located in the back of the room. The tool storage room measuring 3 m x 10 m, with a door to enter and exit the room. The
arrangement of tables and chairs in the Science laboratory is tailored with the need of teaching and learning process. There are a white board and LCD in front of the laboratory room. There are 24 windows and four sinks in the Science laboratory of Junior High School Semesta Semarang. There are no fire-extinguisher and P3K box in the Science laboratory of Junior High School Semesta Semarang.

Characteristic of Science Laboratory Material Management, the management of Science laboratory at Junior High School Semesta Semarang is done based on the educational system applied that is moving class where students stay on their classroom based on the subject to be followed. The reference books are collected from Indonesian and Turkey. The reference books are stored in cabinet located in the back of the Science laboratory room.

Satisfaction of Using Science Lab, the satisfaction of using Science laboratory is influenced by the completeness of available facilities and infrastructure in a laboratory room. The facilities and infrastructure include practicum room, and storage room of practicum tools. Tools in the laboratory are stored in the glass display cabinet in order to facilitate teachers to control it. The chairs and tables can be moved when conducts a discussion for the material being taught. The available of ventilation in a room is urgently needed to help the air circulation in the room. The sink in the laboratory is very helpful for students when the practice is finished.

Implication
1. If the laboratory room design has been relevant to the standard of laboratory, the process of teaching and learning can run effectively.
2. If the delivery of material is relevant to the lesson plan, the standard competence and basic competence can be achieved well.
3. If the laboratory room is well-designed, the laboratory users feel satisfied.

Recommendation
For students, to be more active participate in the teaching and learning process to improve the quality and quantity Science learning so the result will be better.
For teachers, to have more effort to consider the students’ understanding level in Science learning and more varied in using learning method to make students do not bored when following the teaching and learning activities.

For school, to complete facilities in the Science lab, so students and teachers can learn well.

For the further researcher, to be more creative and objective in choosing the issues to be observed related to the management of Science laboratory so can give solution of the Science laboratory utilization.

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Ilham Fertile Jatmiko, husband of Suratmi. From the marriage is blessed with two children namely Ztumas Sabilla Yasza and Athahillah Akbar. The author was born in Semarang on the 9th of September 1971.


ACCEPTANCE

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