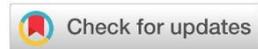


Research Paper

Has the Electrical Laboratory of Subang State Polytechnic Applied Occupational Safety and Health? Evaluation Report in 2019

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Published by Automotive Laboratory of Universitas Muhammadiyah Magelang collaboration with Association of Indonesian Vocational Educators (AIVE)

Abstract**Article Info**

Submitted:

28/05/2019

Revised:

06/07/2019

Accepted:

07/07/2019

The application of Occupational Safety and Health (OSH) is essential in vocational institutions that have a high risk of accidents. Therefore, this study aims to evaluate the application of OSH in the Electrical Laboratory of Subang State Polytechnic using a qualitative descriptive method through observation and interviews. The results of this study indicate that the aspects of the application of the standard Personal Protective Equipment (PPE) and the use of practical work standards have a score of 66.25% and 62.5%, respectively. Meanwhile, the application of room standards seen from the four main indicators, namely furniture, equipment, educational media, and supporting equipment obtained a total score of 91% (high feasibility). In conclusion, the application of the PPE standard and practical work standard must be considered in detail to improve the overall OSH score.

Key words: Electrical laboratory, OSH, Feasibility**Abstrak**

Penerapan Keselamatan dan Kesehatan Kerja (K3) sangat penting dalam institusi kejuruan yang memiliki risiko kecelakaan tinggi. Oleh karena itu, penelitian ini bertujuan untuk mengevaluasi penerapan K3 di Laboratorium Listrik Politeknik Negeri Subang menggunakan metode deskriptif kualitatif melalui observasi dan wawancara. Hasil penelitian ini menunjukkan bahwa aspek penerapan standar Alat Pelindung Diri (APD) dan penggunaan standar kerja praktik memiliki skor masing-masing 66,25% dan 62,5%. Sementara itu, penerapan standar fasilitas ruangan dilihat dari empat indikator utama, yaitu furnitur, peralatan, media pendidikan, dan peralatan pendukung diperoleh skor total 91% (kelayakan tinggi). Kesimpulannya, penerapan standar APD dan standar kerja praktik harus dipertimbangkan secara rinci untuk meningkatkan skor K3 keseluruhan.

Kata Kunci: Laboratorium Listrik, K3, Fisibilitas**1. Introduction**

Subang State Polytechnic is one of the new vocational colleges that aims to produce competent graduates. Learning activities in polytechnic consist of theory and practice, which seeks to improve student competence [1]. Practical

learning generally relates to equipment that has an accident risk, so that the application of OSH must be applied in a standardised manner.

In the Chatigny study [2], teachers and students had a 27.33% chance of being injured in a laboratory. Strengthened by Basori [3], at the end

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of 2017, there were 80,393 work accident cases in workshops and laboratories. In general, the cause of an accident is the condition and action of unsafe workers (incomplete of PPE). PPE in one engineering field will be different from other engineering fields. For example, PPE in welding workers will be different from the PPE needed by electricity workers. Therefore, PPE is essential and must be adapted to their respective fields.

Globally, the protection of workers from injury and disease has long been a concern of employees, workers, government, education, and the general public [4]. To reduce the number of workplace accidents can be realised through training and education [5]. Another determining factor for preventing work accidents is by standardising PPE, work systems, and supporting facilities. The standard is only a guide that shows the desired level of quality for the right product or procedure to carry out tasks in the workplace [6]. Based on these opinions, in addition to the availability of standards regarding OSH, awareness of each worker is also needed to implement OSH. In the vocational education context, the application of OSH must be understood and implemented by instructors and students simultaneously.

Poor OSH implementation can reduce work productivity [6]. That is, the practice learning process can be disrupted if this OSH standard is not implemented properly. At present, the occupational safety and health factors at the vocation campus have not received too

much attention, resulting in losses and even work accidents [7]. In the Subang State Polytechnic, especially in the Electrical Laboratory, until this article was written, there were still many cases of neglect of OSH, as presented in Figure 1.

Some courses practiced in the electrical laboratory are the practice of control systems, basic electrical installations, advanced electrical installations, and so on. Examples of cases that occur in electrical laboratories are short circuits caused by cable connection errors that cause workplace accidents. Therefore, OSH implementation can be maximized if the instructor has competence and relevance regarding OSH standards in the industry [8]. The instructor must be able to supervise and provide the right examples to students to reduce the risk of workplace accidents that occur in the laboratory/workshop. Also, OSH includes management commitment, safety training, employee involvement, regulations, safety procedures, and safety promotion policies [9].

Learning from cases and good practice experience about OSH which was suggested by the previous researchers, this study aims to evaluate the application of OSH in the electrical laboratory of Subang State Polytechnic. Some of the aspects assessed are the standards for the implementation of personal protective equipment (PPE) during practice, standards for applying work procedures in the laboratory, and standard laboratory facilities.



Figure 1. Some photographic views neglect PPE during practice in the workshop

2. Method

The study was conducted on the electrical installation practice course in an electric laboratory, with respondents being students of the engine maintenance department in 2018. The stages of this research are as follows:

- First, the researcher conducted observations to determine the research problems.
- Second, after finding research problems, researchers conducted observations in the library to look for supporting references.
- Third, researchers conduct field observations and interviews with students about the standards of OSH implementation.
- Finally, the data is interpreted to obtain conclusions regarding the application of OSH.

The researcher made an instrument that was validated by experts. The approved instrument is used as a data retrieval checklist. Then, the data is

analyzed by quantitative descriptive method. The scores obtained are then interpreted in the feasibility criteria presented in [Table 1](#).

Table 1. OSH feasibility scale

Score range	Category
100-81%	Very Worthy
80-61%	Worthy
60-41%	Fair enough
40-21%	Not feasible
20-1%	Very inappropriate

3. Result and Discussion

Some of the aspects examined in this study are the standards for the application of personal protective equipment (PPE), standards for applying work procedures in the laboratory, and standard facilities in the laboratory. The results of observations and interviews are presented in [Table 2](#), [Table 3](#), and [Table 4](#).

Table 2. Personal protective equipment (PPE)

Aspects	Score	Condition
1. Students use wear-pack.	95%	Generally applied
2. Students use rubber shoes.	60%	Not according to standards
3. Students use protective gloves.	30%	Not yet implemented
4. The pockets on the wear-pack are not used as a storage place for sharp tools.	75%	Generally applied
Total score	66,25%	

Table 3. Application of work standards

Aspect	be obeyed (yes/no)	Condition
1. Students remove the plug from the socket correctly.	Yes	Generally carried out
2. Students replace broken contacts.	No	Limitations of practical tools and materials
3. Students do not touch open wires.	Yes	Generally carried out
4. Students do not use broken cables.	No	Limitations of practical tools and materials
5. Students do not work on equipment that is still electrified.	Yes	Generally carried out
6. Avoid installing cables lying on the floor.	Yes	Generally carried out
7. Avoid using electrical equipment connected in another room.	Yes	Generally carried out
8. Avoid cables that are crossed or pressured by heavy objects.	No	Generally carried out
Total score	62,5%	

Table 4. Standard room facilities in the laboratory

Kinds	Description	Yes/No
1. Furniture		Yes
2. Workbench	For a minimum of 16 students on installation, inspection and operation work.	Yes
3. Office chair		Yes
4. Storage cabinets		Yes
5. Equipment	For a minimum of 16 students on the job of repairing the main electrical components on the engine.	Yes
6. Equipment for electrical installations		Yes
7. Media Education	To support a minimum of 8 students in the implementation of learning.	Yes
8. Whiteboard		Yes
9. Other Equipment		Yes
10. Contact box	Minimum 2 pieces / laboratory	Yes
11. Trash can		No
Total score		91%

3.1 Aspects of Personal Protective Equipment (PPE)

The aspect of applying PPE has a total score of 66.25% or in the feasible category. The application of PPE is supervised by lecturers and technicians on duty. If students do not wear wear-packs, according to laboratory regulations, students are not permitted to practice. The observation results, as presented in Table 2, are also reinforced by the results of interviews with students who stated that the application of PPE in the workshop was regulated in regulations that must be obeyed. This practice strengthens the results of Basori's study [3] that commitment is needed to build a system in OSH applications that involve the attention of management, instructors, and students to avoid workplace accidents in education workshops.

3.2 Aspects of Applying Work Standards

The aspect of applying work standards is evaluated based on the process when students practice in the laboratory. In this aspect, the total score obtained is 62.5% or in the feasible category. Of the overall eight indicators assessed, two indicators are not implemented by students, related to broken socket and cable. These two indicators have not been implemented due to the

limitations of the practical tools and materials used. In the previous author work [7] optimal supervision from lecturers was needed when students practiced in workshops. According to Endroyo [5], industry-based OSH training is also required to reduce work accident rates.

Based on interviews with students, in general, students understand the aspects of applying work standards through lecturer instruction. However, the absence of standard signs for the application of work installed in the laboratory has made students forget about restrictions that must be avoided. As a solution, laboratory administrators must install signs of implementing work standards.

3.3 Aspects of Implementing Facilities Standards

Aspects of applying room facilities standards are assessed from four main indicators, namely furniture, equipment, educational media, and supporting equipment. Based on observations, the total score obtained is 91% or included in the very feasible category. Indicators that have not received the maximum score are supporting equipment. There is only 1 unit of trash can/laboratory, while the recommended standard is at least two pieces/laboratory. The results of interviews with students found the conclusion

that students already felt quite satisfied with the service and facilities available in the electrical laboratory of Subang State Polytechnic. The standard for implementing a decent room is expected to be able to prevent work accidents. This argument is also reinforced by Rejal [9] that to avoid accidents of work, a safety program is needed that includes safety training for workers to prevent injuries and accidents in the workplace. Finally, to improve work safety levels, in the future it is necessary to make an Android OSH simulator that is easily accessible [10] or other media that accelerates students to apply OSH [11], [12].

4. Conclusion

During the observation, we found that the aspects of the application of PPE and the application of work standards in the electrical laboratory of the Subang State Polytechnic in 2019 were not as expected, which only reached a score of 66.25% and 62.5%, respectively. Meanwhile, better results were obtained in the aspects of the application of room facilities standards, which were assessed from four main indicators, namely furniture, equipment, educational media, and supporting equipment. Based on observations, the total score obtained is 95% or included in the very feasible category. In conclusion, the application of the PPE standard and practical work standard must be considered in detail to improve the overall OSH score.

Acknowledgement

The researcher thanks to the Director of Subang State Polytechnic for the research facilities provided, also to laboratory assistants who had helped during the observation process. The author also thanked the reviewers who gave invaluable suggestions.

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