

The Overview of the Needs for Development of Installation Practice Learning Models to Improve Occupational Safety and Health (OSH) in Vocational High School

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ABSTRACT

An overview of the needs of the learning model of electrical installation practices to improve occupational safety and health for students needs to be known through the analysis process first. As a result, in creating learning models that meet the needs of both teachers and students. This study's analytic procedure employed two techniques, quantitative and qualitative, resulting in two sets of data, namely data from questionnaire results and interviews examined with statistics and descriptive statistics. The study's findings showed that teachers required a learning model of electrical installation practice based on the OSH approach as a guide for planning, implementing, and assessing learning about electrical installation practice. Since the data shows that teachers' understanding of the electric installation practice learning model and the OSH concept is as follows: 1) The teacher's understanding of electrical installation practices with the concept of OSH was still not maximal or average, classified as moderate. 2) Planning for learning the practice of electrical installations with the concept of OSH by teachers was still relatively low, especially the determination of steps and the determination of the implementation of learning. However, overall learning planning of electrical installations with the concept of OSH on average was classified as moderate. 3) The implementation of learning the practice of electrical installations with the concept of OSH by teachers had not been maximal or was still classified as moderate. 4) The implementation of assessment of electrical installation practice learning with the concept of OSH implemented by teachers was still not maximal or classified as moderate.

Keywords: *Overview of Needs, Learning Model, Electrical Installation Practice, Occupational Safety and Health.*

1. INTRODUCTION

In the face of globalization, the fundamental difficulty facing the Indonesian country, particularly in education, is the low level of competency and quality of human resources [1]. The reason for this is that the industry does not require students to have a mastery of their skills. It will negatively influence graduates since vocational schools are not professionally managed, including the learning process and the completeness of facilities and infrastructure in laboratories that are inadequate [2]. It is what led to a paradigm shift towards the new education system. Education is well acknowledged as an intellectual device, but it will fail without context [3]. Anomalies in paradigms tend to lead to crises. A scientific revolution will be required to lead to a new paradigm [4]. In creating quality human

resources, the right education and character formation are required and the ability to equip learners with the skills needed in the workplace [5]. Vocational High School (SMK) can educate students to master skills in certain fields following the chosen major, the Electrical Installation Engineering Expertise Program (TITL). State demands against vocational schools through the National Education System Law No. 20 of 2003 [6]. Article 15 states that the vocational education system has the goal of "preparing learners, especially to work in certain fields." In addition, it is practically also required to master the engineering concepts that exist in the industry. Because the industrial world is part of society, it has an important role in implementing the national education system [7].

On the other hand, these demands cannot always be carried out without risk. Given the advancement of technology in the manufacturing process, it will also have

a significant hazard impact. According to data from the Ministry of Manpower, a hazard is an action that allows for work accidents and occupational diseases [8]. Workplace accidents result from a lack of concern, awareness, and understanding about potential hazards in the environment and workplace, which has resulted in the establishment of occupational safety and health standards (OSH) [9].

Occupational safety and health (OSH) is a framework for ensuring the physical and spiritual integrity and safety of everyone who works [10]. OSH is important and gets significant attention [11]. According to reason (2016), organizational factors are the primary source of dangerous behaviour. When combined with behavioural theory, organizational factors can indirectly induce work accidents caused by a lack of personal protective equipment (APD) and a lack of strict attention to OSH norms and procedures [12]. Safety culture is the interrelationship of three elements: organization, workers, and work [13]. This work culture combines attitudes, norms, and perceptions of occupational safety and health [14]. Based on global estimates, the ILO (International Labour Organisation) reports more than 250 million cases of workplace accidents every year, and more than 160 million workers become ill due to workplace hazards. Moreover, 1.2 million workers will be sick and die at work by 2020. This Figure shows that the effects of poor OSH implementation cause productivity to decrease in Produk Nasional Bruto (PNB), reaching 4% [15]. Therefore, the importance of a behaviour-based approach (behaviour-based safety) to improve workplace safety is consequently apparent [16].

There is a common misconception that the potential for risk in the laboratory is low because it uses comparatively little equipment and materials compared to industry [17]. Though a lack of understanding of the possible threat is the root of the problem, it will result in financial losses, equipment damage, occupational diseases, and even death [18]. Occupational safety and health (OSH) issues are still frequently neglected in the laboratory. The absence of specialized subjects on occupational safety and health (OSH), inadequate laboratory facilities and infrastructure, poorly maintained equipment, outdated electrical installation practicum modules, and the lack of standard personal protective equipment are all determinant factors that cause accidents when students practice (APD). In addition, the absence of binding operational standards (SOPs), practical materials that are not following SNI standards, the none of light fire extinguishers (APAR), the absence of hazard signs, and students are not being equipped with making Job Safety Analysis (JSA) that serves to predict the impact of hazards that will arise. Therefore, it is considered necessary to instil a working character integrated into the subjects of electrical installation practice with various strategies that are believed to be corrective and preventive solutions in response to the phenomenon of work accidents in vocational schools [19]. One of them is developing a learning model of electrical installation

practice to improve occupational safety. Also, it is to improve health in vocational high schools as a guide for teachers and students in conducting practicum learning in laboratories. Particularly, those related to electrical installation must first be known to describe the need for models to be developed at the early stages.

2. METHODS

This research analyzed the need to develop electrical installation practice learning models to improve occupational safety and health in Vocational High School Makassar using a mix-method approach, combining quantitative and qualitative research types. Quantitative data was collected through questionnaires, while qualitative data was collected through interviews so that the study's results could be analyzed and presented statistically and descriptively.

3. RESULTS AND DISCUSSION

The analysis of needs as the issues raised in this study was the first step in developing a learning model of electrical installation practices to improve occupational safety and health in vocational schools. The analysis results were objective preliminary information for researchers so that the learning model could be developed following the needs of teachers and students in Vocational High School. In this section, the aspects to be analyzed and described were four aspects, namely: (1) aspects of the teacher's understanding of the learning model of electrical installation practices and the concept of OSH; (2) aspects of planning the learning of electrical installation practices with the OSH approach; (3) the implementation of learning for the practice of electrical installations with the OSH approach; (4) aspects of assessment of electrical installation practice learning with the OSH approach.

3.1. Aspects of Teacher Understanding of Electrical Installation Practice Learning Models and OSH Concepts

The teacher's understanding of the learning of electrical installation practice with the OSH approach: (1) the basic concept of learning the practice of electrical installation with the OSH approach; (2) an understanding of the planning of learning the practice of electrical installations with the OSH approach; (3) an understanding of the implementation of electrical installation practice learning with the OSH approach, and (4) an understanding of the assessment of electrical installation practice learning with the OSH approach. Conceptually, these four aspects are importantly understood by teachers as basic skills in the management of learning.

Based on the results of preliminary studies, it was found that: (1) the basic concept of learning electrical

installation practice with an average OSH approach of 3.30 or being in the moderate category; (2) an understanding of the learning planning of electrical installation practice with an average OSH approach of 3.07 or being in the moderate category; (3) an understanding of the implementation of electrical installation practice learning with an average OSH approach of 2.85 or being in the moderate category; and (4) an understanding of the assessment of electrical installation practice learning with an average OSH approach of 2.77 or being in the moderate category. More details about the teacher's understanding of the learning of electrical installation practices with the OSH approach can be seen in the following figures:

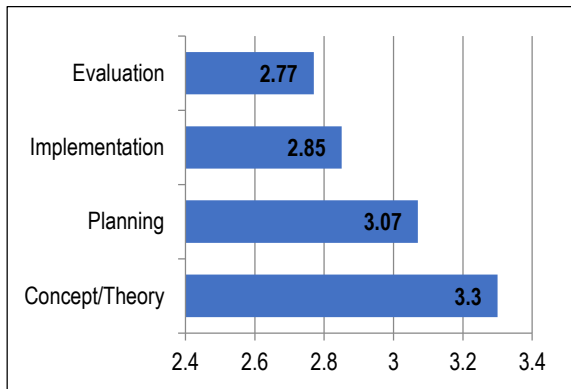


Figure 1. Aspects of the teacher's understanding of the learning model of electrical installation practice and the concept of OSH

Based on Figure 1, it is known that the teacher's understanding of the learning model of electrical installation practice and the concept of OSH above shows that the teacher's understanding is still not maximal or average, classified as moderate. It is following the results of an interview with Dra. Hj. Janarti Rahman, M.Pd., as the head of the Department of Electricity, stated that of the eight teachers who teach on electrical skills, only three had followed the training on OSH, meaning that there are still many teachers who do not understand the application of OSH in the learning process conceptually.

3.2. Aspects of Understanding About Electrical Installation Practice Learning Planning with OSH Approach

Planning the learning of electrical installation procedures using the OSH concept contains a set of decision-making activities that will result in future learning programs. The use of the OSH concept to planning the learning of electrical installation practices is intended to be realistic because of the environment and demands of students. Learning objectives, learning goals, learning steps, and learning implementation time are all used to develop learning for electrical installation procedures using the OSH approach. The results of the analysis of electrical installation practice learning of planning indicators with the concept of OSH by teachers

showed that four indicators of learning planning electrical installation practices with the concept of OSH had not been maximal and even tended low. (1) The teacher planned the learning by setting an average goal of 3.32 or a moderate category. (2) The teachers planned to learn electrical installation practices with the concept of OSH, setting an average target of 2.84 or a moderate category. (3) The teachers planned to learn by setting average learning steps of 2.60 or including low categories. (4) The teachers planned electrical installation practice learning with the concept of OSH, first set an average learning implementation time of 2.57 or include low categories. For more details, the results of the analysis on the learning of electrical installation practices with the concept of OSH by teachers each indicator can be seen in the following Figure:

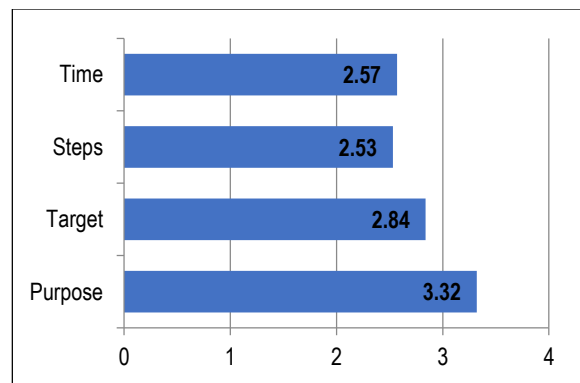


Figure 2. Aspects of Understanding About Electrical Installation Practice Learning Planning with OSH Approach

Figure 2 shows that teachers' planning of learning the practice of electrical installations with the concept of OSH is still relatively low, particularly in terms of step determination and learning implementation. Overall planning and learning the practice of electrical installations using the OSH average approach, on the other hand, is classified as moderate. Several problems, including a lack of teacher comprehension of learning planning and a lack of time, have impacted the maximum learning process of electrical installation practice with the idea of OSH. As a result, learning planning only follows the planning completed in previous years. It is following the results of the plan with some teachers, who, in conclusion, state that: "Basically, all teachers make plans by setting learning goals and objectives according to the conditions and needs of students." However, the planning tends to be the same as other teachers. Learning steps are not arranged systematically because they are adapted to the concepts used on average by teachers. At the same time, the implementation time is adjusted to the opportunities that exist in each teacher.

3.3. Aspects of Learning Implementation for Electrical Installation Practice with OSH Approach

The implementation of learning is the planning of electrical installation using the OSH concept that teachers have compiled. The learning has successfully required the development of conceptual, interpersonal, and engineering abilities. As a result, every teacher must have technical skills, such as applying concepts, procedures, types, and approaches to learning appropriate to the environment and conditions in which they are being taught.

Based on the findings of data analysis for aspects of learning implementation carried out by teachers, It shows that: (1) teachers applied the principles in carrying out learning electrical installation practices with the concept of OSH on average of 3.31 or classified as a moderate category, (2) teachers applied to learn on various average kinds of learning techniques of 3.21 or classified as moderate categories, (3) teachers applied principles in carrying out learning electrical installation practices with an average OSH concept of 3.29 or classified as moderate categories; and (4) teachers applied an average learning approach of 3.35 or classified as a moderate category. The results of a complete analysis of electrical installation practice learning implementation with the concept of OSH by the teacher for each indicator can be seen in the following Figure.

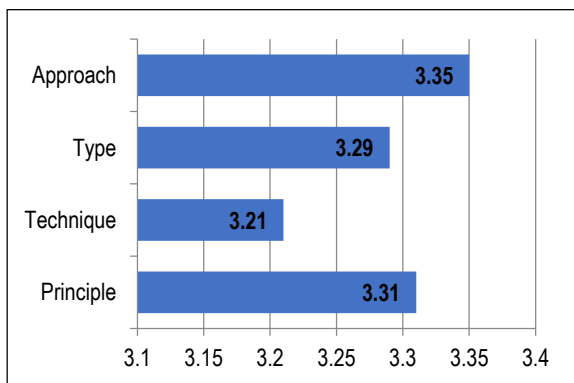


Figure 3. Aspects of Learning Implementation for Electrical Installation Practice with OSH Approach

Figure 3 shows that teachers have not implemented learning the practice of electrical installations with the concept of OSH to its maximum potential, and it is still categorized as moderate. Several factors influence the maximum implementation of electrical installation practice learning with the concept of OSH. The time available to carry out learning by applying various principles, techniques, types, and learning approaches is severely limited due to the numerous tasks that teachers must complete.

3.4. Aspects of Learning Assessment of Electrical Installation Practices with OSH Approach

Learning outcomes implemented by teachers need to be evaluated to impact enhancing student learning outcomes. Aspects of the assessment in the form of evaluation and analysis of evaluation, reporting, and follow-up results in strengthening and awarding are given to students who have met the standards or achievements of learning electrical installation practices with a OSH approach.

Based on the results of data analysis for aspects of electrical installation practice learning assessment with the OSH approach that teachers have implemented, it shows that: (1) teachers conducted evaluations and analyzed the results of learning evaluations on an average of 3.02, which was classified as a moderate category. (2) teachers compiled and submitted reports on implementing electrical installation practice learning with the concept of OSH to students and parents on an average of 4.13, which was classified as a high category. (3) Teachers carried out and followed up on the results of learning electrical installation practices with OSH concepts on an average of 2.90, which was classified as a moderate category. More details about the implementation of the assessment of electrical installation practice learning with the concept of OSH by teachers can be seen in the Figure below:

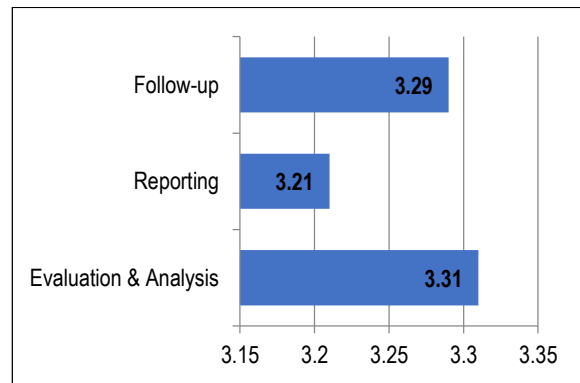


Figure 4. Aspects of Learning Assessment of Electrical Installation Practices with OSH Approach

Figure 4 shows that the implementation of the assessment of electrical installation practice learning with the concept of OSH implemented by teachers is still not maximal or classified as moderate. However, reporting the results aspect of electrical installation learning practice with OSH to students and parents is already included in the high category. The high reporting results are due to teachers' being required to report all learning activity results to principals, which are passed on to the students' parents. Also, because some teachers still do not grasp the use of assessment instruments and processes for assessing the outcomes of learning assessments, the maximum evaluation and analysis of evaluation results

and follow-up evaluation results have not yet been achieved.

Based on the results of the needs analysis as described in the four points above to find out the needs of teachers and students for the development of electrical installation. Overall, it is still not maximal, so it is concluded that the need for a new learning model is a learning model of electrical installation practice with a very high OSH approach.

The conclusion was strengthened by an interview with Agustiah, S.Pd., M.Pd. (teacher of electrical installation practice subjects), which stated that: "The practice of electrical installations with the concept of OSH has been carried out so far, although it has not been maximal, so there are still some shortcomings there, especially in uniformity of implementation patterns that are still very varied and the lack of time available to teachers. Therefore, if there is a pattern or model of practical learning that can be used as a reference or guide in the implementation of electrical installation practice learning, then I think it is very good."

4. CONCLUSION

The research results of the need for a new learning model, namely a learning model of electrical installation practice with a high OSH approach, as needed by teachers of electrical installation practice subjects to provide knowledge and build the character of electrical installation engineering students about the importance of OSH is important. So, students always apply the principles of OSH. Furthermore, the model is a preventative measure against workplace accidents during practical learning.

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