

Level Of Validity And Practicality Of Electrical Installation Practice Learning Model To Improve Occupational Health And Safety In Vocational School

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ABSTRACT

The learning model of electrical installation practices to improve occupational health and safety for vocational students that has been developed needs to know the aspects of validity and practicality through an expert validation process followed by the assessment of teachers as users. The process of validation and practicality testing of the model's product using a descriptive-qualitative approach. Then the data was collected through quiz instruments and interviews, and the data was analyzed by looking at the average score of the validator. After the teacher's expert validation and practicality, a descriptive conclusion was made about whether the practicum learning model of electrical installations has been developed and has met the aspects of product validity and practicality. The results showed that aspects of validity and practicality of teacher books and job sheets of electrical installation practice subjects were expressed as very valid with validity scores based on assessments from experts of: (1) for teacher books, the validity value was 3.7, or in the category of very valid; (2) for job sheets, the validity value was 3.6, or in the category of very valid; and (3) for practical values, the practicality value was 3.66, or in the category of very practical. Therefore, teacher books and job sheets of the electrical installation practice learning model that have been valid and very practical can be continued to determine the product's effectiveness.

Keywords: Validity, Practicality, Learning Model, Electrical Installation Practice, OHS

1. INTRODUCTION

Occupational health and safety are important and should get serious attention. International attention to OHS has increased since the Occupational and Safety Management System (Hadi, 1999) was published by British Standard International (BSI) and world certification bodies containing OHSAS management standards. While in Indonesia, (President of Republic of Indonesia, 1970) the rules on OHS are stated in Law No. 1 of 1970 concerning work safety and the Republic of Indonesia Law Number 13 of 2003 concerning employment (State Gazette of the Republic of Indonesia, 2003). Furthermore, the main objectives of implementing OHS are to protect and ensure the safety of every workforce, ensure the safety of every workforce and others in the workplace, ensure that every

product can be used safely and efficiently, and improve national welfare and productivity.

A work accident is an unplanned, uncontrolled, and undesired event at work caused by unsafe actions and unsafe conditions, so work activities stop (Abdullah, Fahrizal, & Herdiansyah, 2009). The occurrence of work accidents caused by low awareness and knowledge about potential hazards in the environment and work facilities is also the cause of achieving established OHS standards. (Agustina, Ansori, Novianti, & Farikha, 2017) said that the occurrence of work accidents is caused by two factors: first, an unsafe condition, mechanical condition, and environmental factors; and second, (unsafe action), the human factor.

According to (Suma'mur, 2014), human factors occupy a very important position in work accidents,

which is between 80–85%. A worker performing unsafe actions reflects various psychiatric conditions such as knowledge, desires, interests, emotions, intentions, thinking, motivation, perception, attitudes, reactions, and so on, (Abidin et al., 2009). Three factors affect the individual: first, basic factors (predisposing factors), including knowledge, attitudes, habits, social norms, worker involvement, and communication with elements in society manifested in motivation. Second, enabling factors, including community resources or potential, manifested in training, the availability of facilities or means of work safety, physical environment, and work environment. Third, (reinforcing factors) include the attitudes and behaviors of others that manifest in social support. For example, reinforcing factors are management commitments, supervision, laws, regulations, and procedures of Occupational Health and Safety Green.

1.1. Standard of Occupational Health and Safety (OHS)

Discussing Occupational Health and Safety (OHS), the first thing that is most important to know is "anything that becomes the Occupational Health and Safety (OHS) standard." Here are the points that make up the OHS standard:

1. Prevent and reduce accidents
2. Prevent, reduce and extinguish fires
3. Prevent and reduce detonation hazards
4. Provide opportunities or ways to save themselves at the time of a fire or other dangerous event.
5. Giving classification to accidents
6. Providing workers with personal protective equipment
7. Prevent and control the onset of occupational diseases, physical and psychic, poisoning, infection, and transmission.
8. Obtain adequate and appropriate lighting.
9. Organizing adequate air, proper air temperature, and humidity levels
10. Maintaining the workplace's cleanliness and neatness
11. Ensure that labor and work tools are compatible.
12. Securing and facilitating the transportation of people, animals, plants, and goods
13. Securing and maintaining all kinds of buildings
14. Securing and streamlining loading and unloading work, treatment and storage of goods
15. Prevent exposure to potentially harmful electricity
16. Adjust and use safeguards on hazardous work.

1.2. Occupational Health and Safety (OHS) Terms and Conditions

The terms and conditions in the process of implementing Work Safety in the Field of Electricity are as follows:

1. Electrical installations that have been completed must be inspected and tested before being electrified by electrical specialist supervisory employees.
2. For installations that have been electrified, the installer is still bound by one year of responsibility for accidents, including fires due to electrical installation errors.
3. There must be regular checks on insulators. Cracked insulators, especially for medium and high voltages, can cause interference with business or cause accidents.
4. All electrical installations, not only those that are easily exposed to interference, but also safety, protection, and equipment, must be maintained properly.
5. Do not allow worn out, aging, or damaged counterparties. Immediately replacement is made.
6. Oil switch insulators, transformers, and so on should be filtered overtime to remove water, dust, charcoal, and acidic substances, among other things.

7. Equipment such as relays is more disturbed by damage. Therefore, it must be tested on it.
8. In carrying out maintenance, those that during maintenance are opened or removed must be reassembled in place.
9. It is allowed to store flammable materials in areas that can harm electrical installations.
10. In the room with the danger of explosion, it is not allowed to carry out repairs and expansion of the installation in a voltage state, and in a safe state, electrical equipment must be well maintained.

1.3. Learning Model of Electrical Installation Practice to Increase OHS

Responding to the importance of OHS learning, a special learning model has been developed for the subject of electrical installation practicum. It is an effort to improve the aspects of OHS learning for vocational students with expertise in electrical installation engineering (TITL) as candidates for the level 3 workforce in the electricity field. The OHS learning model, especially in electrical installation practice, is needed by teachers and students to improve knowledge, attitudes, and skills in practicum. It is based on the phenomenon of work accidents increasing rate experienced by the workforce, especially in the electricity field, as a result of the lack of knowledge, attitude, and skills of these workers in terms of OHS, even though OHS is the main requirement in organizing the practice of electrical installations. According to him again, the OHS learning stage must start with learning practical electrical installations in schools (vocational) as a form of strengthening the knowledge, attitude, and skills of prospective workers in the field of electricity from an early age. As for the OHS learning steps in vocational school, they are generally outlined based on their components as follows:

1. Syntax
 - Manage (Preparation): Teachers prepare to learn tools, including RPP,

learning media, teacher manuals, learner practicum guides, and student worksheets (LKPD).

- Analysis Learner
2. Teachers group learners based on the level of knowledge development (Student Analysis)
 - Require Learner Participation (participation of learners). Teachers provide motivation (attract the attention) of learners to participate in learning activities
 - Life Skills, Teachers train learners to increase creativity.
 - Investigation: The Master investigates the results of student practicum
 - Negotiation, Teachers conduct Q&A with students on how to solve problems (problem-solving) in case of failure in practicum

3. Social system

This learning model of teachers acts as a facilitator who is expected to build cooperation in the learning process through organizing classrooms and preparing learning devices, including lesson plans, learning media, teacher manuals, learner practicum guides, and student worksheets (LKPD). In addition to being a source of learning, teachers can also instruct students' knowledge. Therefore, the learning model is very good for being implemented to stimulate student motivation.

4. Reaction Principle

Reaction principles are very closely related to instructional techniques expected by teachers in responding to every question, answer, and response during learning activities while providing learning motivation and focusing the attention of learners.

5. Support System

This learning model teacher is expected to prepare all the components to support the learning model, including props such as posters and examples of electrical installation materials, practicum facilities such as circuit boards and electrical panels, teaching materials, and OHS-oriented learner worksheets (LKPD) containing cognitive, affective,

and psychomotor aspects of learners. Lesson plans (RPP) and practicum guidance

6. Instructional impact

Activities to train and challenge learners to collaborate with other learners. This condition allows learners to have a greater opportunity to construct their knowledge.

7. Accompaniment Impact

It is the formation of learners' personalities who always prioritize safety at work and always apply healthy behavior at work. It is in line with the concept of OHS, which ensures the integrity and perfection of workers both physically and spiritually and aims to maintain the safety and comfort of the workforce to achieve physical resilience, work power, and high levels of health.

2. METHODOLOGY

This study analyzed the results of the validity and practicality of the electric installation practice learning model to improve occupational health and Safety in vocational high schools using a descriptive qualitative approach. Then the data was collected through the questionnaire and interview instruments. The data was analyzed by looking at the average score of the validator through this formula:

$$\text{Average} = \frac{\text{Number of Value}}{\text{Amount of Data}}$$

After knowing the results of expert validation and practicality from the teacher, a descriptive conclusion is made as to whether the practicum learning model of electrical installations that has been developed has met the aspects of product

validity and practicality or not.

3. RESULTS AND DISCUSSIONS

The analysis of needs as the issues raised in this study was the first step in developing a learning model for electrical installation practices to improve occupational health and safety in vocational schools. The analysis results were used as initial objective information for researchers so that the learning model developed was following the needs of teachers and students at SMKN 3 Makassar. 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 practice and the concept of OHS; (2) aspects of planning the learning of electrical installation practices with an OHS approach; (3) implementation of learning for the practice of electrical installation with an OHS approach; and (4) aspects of assessment of learning the practice of electrical installation with an OHS approach.

3.1. Aspects of The Validation of The Learning Model of Electrical Installation Practice

1. Teacher's Book

The results of expert validation of the learning model book were presented based on the product feasibility component, including (a) aspects of the development foundation; (b) aspects of language; and (c) components of the electrical installation learning model to increase OHS in SMK can be seen in table 1 below:

Table 1. Expert Validation Results

Assessment Aspects	Sub Assessment Aspects	Option			Category
		V1	V2	V	
Overview					
Development Foundation	Rational	4	4	4	Very Valid
	Objective	4	4	4	Very Valid
	Goals	4	4	4	Very Valid

	Benefit	3	4	3.5	Very Valid
	Foundation	4	3	3.5	Very Valid
	Instructions	3	4	3.5	Very Valid
Language	Sentence structure	4	3	3.5	Very Valid
	Language	4	3	3.5	Very Valid
	Writing	3	4	3.5	Very Valid
Content					
Components of the electric installation practice model	Syntax	3	4	3.5	Very Valid
	Social System	4	4	4	Very Valid
	Reaction Principle	3	4	3.5	Very Valid
	Support System	3	4	3.5	Very Valid
	Instructional impact	4	4	4	Very Valid
	Accompaniment Impact	4	4	4	Very Valid
Total Assessment Results		3.6	3.8	3.7	Very Valid

2. Job Sheet

The results of expert validation of the Job Sheet are presented based on the product feasibility component, including: (a) aspects of the

instructions; (b) aspects of material feasibility; (c) aspects of the procedures of the electrical installation learning model to increase OHS in vocational can be seen in table 2 below:

Table 2. Expert validation of The Electrical Installation Practicum Guide Job Sheet

NO	DESCRIPTION	OPTION			CATEGORY
		V1	V2	V	
Aspect of Instruction					
1	Instruction	4	3	3.5	Very Valid
2	Learning objectives	3	4	3.5	Very Valid
Aspects of material feasibility					
3	Content	4	4	4	Very Valid
4	Working Principles	4	4	4	Very Valid
5	Learning Concepts	3	3	3	Valid

6	According to science and technology	4	3	3.5	Very Valid
7	Procedures and methods	4	4	4	Very Valid
Aspects of Procedures					
8	Work order	4	3	3.5	Very Valid
9	Language readability	3	4	3.5	Very Valid
Total Assessment Results		3,66	3,55	3,6	Very Valid

The results of expert validation of the Electrical Installation Practicum Guide Job Sheet were validated by two experts. Expert validators help validate the accuracy of designing teaching materials (Suparti, Wiryokusumo, & Adiwajujo, 2015). So, if there is an inappropriate part, it can be revised again. For example, validator (1) media expert assesses teaching materials in the form of physical size, print, font size, color, illustration, and accuracy of components. For example, teaching materials are well packaged to make students interested in learning (Oktaviana, Sumitro, & Lestari, 2015). For example, validator 1 (V1) gets a score of 3.66, including the Very Valid category, and validator 2 (V2) gets a score of 3.55, including the Very Valid category. Based

on the validation results of both, they then obtained a value of 3.6, which falls into the Very Valid category. But it still requires revisions to ensure the practicality of the job sheet within the learning model developed. Validator suggestions/comments will provide the meaning of the material to be arranged systematically, simply towards more complex materials (Salim, 2016).

Teaching materials must also have a complete component to achieve learning goals (Lestari, 2013; Prastowo, 2013) and examples of questions and how to answer them (Mbulu & Suhartono, 2004). Learning media is one way to support the learning process. Learning media is used to clarify the presentation of information, validate and provide practicality in providing learning experiences, providing learning motivation, and overcoming the limitations of senses, space, and time (Ariyanto, Priyayi, & Dewi, 2018). Well-designed teaching materials can be used to practice truth in systematic, analytical, critical, and creative thinking (Salim, 2016).

3.2. Practical Aspects of The Learning Model of Electrical Installation Practice

The results of expert validation of practical aspects of the electrical installation practice learning model against the job sheet are presented based on the product feasibility component. It includes: (a) aspects of learning devices; (b) the feasibility aspect of presenting the material of the electrical installation learning model to improve OHS in vocational It can be seen in Table 3 below:

Table 3. Expert validation results of practical aspects of electrical installation practice learning models against Job Sheet

No	Assessment Items	Assessment				Category
		V1	V2	V3	V	
Learning Device Aspects						
1.	Suitability of KI and KD	4	3	4	3.66	Very Practical

2.	Suitability of indicators and objectives	3	4	4	3.66	Very Practical
3.	Suitability of models and materials	3	3	4	3.33	Very Practical
Feasibility Aspects of Material Presentation						
4.	Teaching materials	4	4	3	3.66	Very Practical
5.	Learning materials	4	4	4	4	Very Practical
6.	Illustrated image	3	4	4	3.66	Very Practical
Total Assessment Results		3.5	3.6 6	3.8 3	3.66	Very Practical

The results of the expert validation assessment aspects of the practicality of the electric installation practice learning model against the job sheet are: the first validator (V1) gives a rating of 3.5 or falls into the very practical category; the second validator (V2) assesses 3.66 or falls into the very practical category. Based on the conclusion of the two validators, 3.86 is included in the category of Very Practical. Therefore, products that have been developed are worthy of being used by students more effectively and efficiently (Sunismi & Fathani, 2016). Comments and suggestions given by validators are to be added to questions in each practicum so that students can identify and analyze problems until they are solved (Nugraha, Binadja, & Supartono -, 2013). It is so that the job sheet can be understood by students and be very practical to use (Mbulu & Suhartono, 2004).

4. CONCLUSION

Aspects of validity and practicality of teacher books and job sheets of electrical installation practice subjects developed from the results of research on the learning model of electrical installation practices to improve occupational health and safety in vocational schools are declared very valid with validity values based on assessments from experts of: (1) For teacher books, the validity value is 3.7, which falls into the category of very valid; (2) for job sheets, the validity value is 3.6, which falls into the category of very valid; and (3) for practical

values, the practicality value is 3.66, which falls into the category of very practical. Teacher books and job sheets of the electrical installation practice learning model that has been valid and very practical can be continued to determine the product's effectiveness.

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