International Journal of Applied Mathematics

Volume 38 No. 5 2025,

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

DEVELOPMENT OF STUDENTS' SOFT SKILL ASSESSMENT IN BASIC ELECTRICAL ENGINEERING PRACTICE ACTIVITIES IN VOCATIONAL HIGH SCHOOLS

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Abstract

Vocational high school (SMK) carries out learning activities to educate skilled workers capable of working in the business and industrial world. In the learning process at SMK, teachers educate and teach about theoretical and practical subject matter. Soft skills are an important aspect so that practical activities are in accordance with the objectives. Based on the pre-survey, it shows that SMK teachers do not yet have instruments. The specific objective of the study is to develop an observation assessment in practical activities in the subject of Basic Electrical Engineering for students at SMK. The research method is research and development (R&D) 4D model. It was found that the developed Basic Electrical Engineering (DTL) practical assessment meets validity requirements and is very practical and effective for use in measuring and assessing students' soft skills in DTL practical activities.

Keywords: Soft skill assessment, DTL practice.

1. INTRODUCTION

Vocational schools (SMK) are formal educational institutions that provide secondary education in the implementation of the learning process with more practical activities specifically educating prospective skilled workers. SMK is being developed in Indonesia to prepare individuals to be more capable of working in a particular field of work. Vocational education or vocational aims to meet the needs of society regarding the workforce (Evans, 1978). This explanation is in line with that explained by Pavlova (2009), namely that vocational education and training activities are a process to prepare the formation of students who have the skills, abilities, understanding, behavioral attitudes, work habits, and appreciation for jobs needed by society and the business world or industry supervised by the community and government.

Based on this explanation, students are expected to possess skills and abilities called hard skills, while behavioral attitudes, work habits, and appreciation are forms of soft skills. Alumni of the Vocational School (SV) UGM (2016) said the world of work believes that superior human resources (HR) not only have hard skills but also expertise in soft skills. The results of research at Harvard University in the United States showed that a person's success is not determined solely by knowledge and technical abilities or hard skills alone, but more by the ability to manage oneself and others (soft skills). This study revealed that success is only determined by hard skills about 20% and the remaining 80% by soft skills. Workers who have soft skills are needed in the industrial world (Widarto, Pardjono, and Widodo, 2012). It is a reality that

Received: August 04, 2025

Volume 38 No. 5 2025,

ISSN: 1311-1728 (printed version); ISSN: 1314-8060 (on-line version)

education in Indonesia gives a larger portion to hard skills content, in fact it can be said to be more oriented towards learning hard skills alone. So how much soft skills content should be in the educational curriculum? Actually, the determinant of a person's success is more due to the soft skills element. Soft skills are crucial for a person's success in performing an activity (Herson & Wirda, 2012; Tang, 2018; Pachauri and Yadav, 2014). In addition to technical skills, soft skills are a crucial factor for various organizations (Robles, 2012; Ilias, Razak, Yunus, Rasak, 2012). Many industrial and service companies are frustrated by the inadequate workforce (Taylor, 2016).

Sutrisno (2016) stated that students, as subjects and products of education, are required to possess eight core competencies, namely (1) communication skills; (2) critical and creative thinking; (3) inquiry/reasoning skills; (3) interpersonal skills; (5) multicultural/multilingual literacy; (6) problem solving; (7) information/digital literacy; and (8) technological skills. Of these eight competencies, 1-6 are soft skills, while 7 and 8 are hard skills. According to Pramuniati (2013), the imbalance in teaching that emphasizes hard skills over soft skills is a serious problem for the world of education that needs to be addressed immediately.

The learning process in vocational schools is very important to master theory and practice so that students' behavior regarding soft skills needs to change their behavior as explained by (Fayadi, 2012) learning is a process to change a person's behavior in learning activities.

In order for DTL practice activities in vocational schools to produce optimal learning and training processes, students must have measurable soft skills to serve as information for conducting formative evaluations in DTL practice activities. Formative evaluation has the aim of knowing the extent to which it has been formed in accordance with teaching objectives within a certain period after participating in learning activities for a certain period (Sudjana, 2017). Furthermore, Silverius (1991) said that formative evaluation is carried out in the middle of a teaching program which has the function of monitoring students' learning abilities in the teaching and learning process in order to provide feedback to students and teachers. In order to measure soft skills, it is necessary to develop soft skill assessments for DTL practice activities.

2. LITERATURE STUDY

Soft Skill

Soft skills are personal behavior (Choudary & Ponnuru, 2015; Herison & Wirda, 2012; Schulz, 2008). Soft skills are related to intrapersonal and interpersonal (Aly, 2017; Illah, 2008:19). Moss & Till in Romedios (2012) define soft skills as skills, abilities and traits related to personality, attitudes and behavior. Rumengan, et al (2011: 67), defines soft skills as life skills and abilities, both for oneself, in groups, or in society, as well as with the Creator. By having soft skills, a person's presence will be increasingly felt in society. Skills will be communication, emotional skills, language skills, group skills, having ethics and morals, being polite and spiritual skills. Furthermore, Rumengan, et al. said that soft skills cause hard skills to function.

According to Aribowo, as quoted by Illah (2008: 17), soft skills are a person's ability to relate to others (including themselves). Soft skills attributes, therefore, include values, motivation,

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Volume 38 No. 5 2025,

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behavior, habits, character, and attitudes. Each person possesses these soft skills attributes to varying degrees, influenced by their habits of thinking, speaking, acting, and behaving. However, these attributes can change if the person is willing to change them by practicing and adapting to new things.

Soft skills complement hard skills. These skills are part of a person's intellectual intelligence and are often required to obtain certain positions or jobs (Mulyono, 2011:99). Someone with soft skills will communicate well, work well, influence others, and get along well with others (Agarwal & Ahuja, 2014).

Aspects of students' soft skills in TDL practical activities include: initiative, active, obedient, responsive, cooperative, creative, enthusiastic, positive attitude, communication, honesty, politeness, and ethics.

Evaluation

Assessment has specific terminology to describe the activities carried out by teachers to obtain information about students' knowledge, skills, and attitudes (Marsh, 1996). Attitude is one aspect of soft skills, meaning soft skills need to be measured.

Assessment is a series of activities to obtain, analyze, and interpret data about the learning process and outcomes at the class level that are carried out systematically and continuously, so that it becomes meaningful information in decision making (Sukirman, 2012), further said that assessment is related to measurement and evaluation. Before conducting an evaluation, measurement and assessment are first carried out. Ponto (2016) said that measurement and assessment are carried out to obtain information as a basis for making policies or decisions about the implementation of educational programs.

DTL Practice

Practice is the actual implementation of what is stated in theory (Hasan, et al, 2005). Komaruddin (2006) also stated that practice is a way of implementing what is stated in theory in real situations. Based on the theory, what is explained in the theory will be applied in practical activities. Various types of practical implementations, including in laboratories (often called practicums) and workshops (workshops) are used to train students' skills so they have certain competencies as stated in the school or college curriculum.

Notoatmodjo (2003) states that practice is divided into 4 levels according to its quality, namely: (1) Perception. Recognizing and selecting various objects in relation to the action to be taken is the first level of practice; (2) Guided response. Being able to do something in the correct order and according to an example is an indicator of second level practice; (3) Mechanism. If someone can do something correctly automatically or it has become a habit, then he has reached third level practice; and (4) Adaptation, which is a practice or action that has developed well. This means that the action has been modified without reducing the correctness of the action. In this case, Notoatmodjo emphasized that someone who carries out practical activities until they achieve perfect skills does so through a certain level of process.

Received: August 04, 2025

International Journal of Applied Mathematics

Volume 38 No. 5 2025,

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The topics of DTL practical activities include: (1) how to use measuring instruments; (2) measuring conductor conductivity, voltage, current, resistance, and frequency; (3) testing electrical and electronic components; and (4) using an oscilloscope to observe wave curves.

In order for DTL practical activities to be carried out well, students are required to do it seriously by fulfilling the soft skill aspects.

3. RESEARCH METHODS

This research is to develop soft skill assessment in DTL practice activities in SMK in North Sulawesi province. The method used is R&D. The purpose of R&D is to develop a good and effective product for schools (Gay, Mills, and Airasian, 2012). The R&D used is the four-D (4D) model developed by Thiagarajan, Semmel & Semmmel (1974) with the following stages: (1) define, namely to define the soft skill aspects of students in DTL practice activities; (2) design, namely designing an assessment model; (3) develop, namely to improve the product based on expert validation, field trials on the practicality and effectiveness of the product; and (4) disseminate, namely the distribution of the product in the Electrical Engineering expertise program of SMK in North Sulawesi.

This research will develop an assessment of students' soft skills in DTL practical activities. To obtain a quality product, this research will test its validity, practicality, and effectiveness, as stated by Nieveen (1999: 127) that product quality in education is reviewed from three aspects: validity, practicality, and effectiveness.

4. RESULTS AND DISCUSSION

The product developed in this research is a soft skills assessment in DTL practical activities at vocational schools.

R&D products need to be validated by experts and undergo practicality and effectiveness tests (Sugiyono, 2012). To test validity, practicality, and effectiveness, a product must meet the criteria (Nieveen, 1999).

Validation in this study concerns the content of the soft skills assessment. Validation was conducted by two experts in educational measurement and evaluation to provide their opinions on the content of the soft skills items. The rubric to be filled in by the experts uses a Likert scale, namely very good (5), good (4), sufficient (3), less (2), and very less (1). Validity assessment criteria are seen in Table 1.

Table 1. Product validity criteria

Range	**information**
$V > 4.5$	Very valid
$3.5 < V \leq 4.5$	Valid
$3.0 < V \leq 3.5$	Quite valid

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International Journal of Applied Mathematics
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2.5 < V≤3.0	Less valid
≤ 25	Invalid

Overall product validity is calculated using the formula:

$$V = \frac{\Sigma M}{n} \quad \text{... [1]}$$

Where: validity level, = total mean, and number of items.$V = \Sigma \text{Mn} =$

The product trial subjects were teachers who teach DTL practical subjects. In this trial, teachers used product drafts to assess students' soft skills in DTL practical activities. The soft skills instrument rubricusing a Likert scale, namely very good (5), good (4), sufficient (3), less (2), and very less (1). The criteria for assessing the practicality and effectiveness of the product are shown in tables 2 and 3.

Table 2. Practicality testing criteria

Range	**Information**
P > 4.5	Very practical
3.5 < P≤4.5	Practical
3.0 < P≤3.5	Quite practical
2.5 < P≤3.0	Less practical
P ≤ 25	Not practical

The practicality of using the product to assess students' soft skills in DTL practical activities as a whole is calculated using the formula:

$$P = \frac{\Sigma S}{n} \quad \text{... [2]}$$

Where: practicality level, = total practicality score, and number of assessing teachers.$P = \Sigma Sn =$

Table 3. Criteria for testing effectiveness

Range	**Information**
E > 4.5	Very effective
3.5 < E≤4.5	effective
3.0 < E≤3.5	Quite effective
2.5 < E≤3.0	Less effective
E≤ 25	Ineffective

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Overall, the effectiveness of the product for assessing students' soft skills in DTL practical activities is calculated using the formula:

$$E = \frac{\Sigma S}{n} \quad \text{... [3]}$$

Where: level of effectiveness, = total effectiveness score, and number of assessing teachers.$E = \Sigma S n =$

The expert validation data are shown in Table 4.

Table 4. Product validation by experts

Item No.	Assessor Score		Mean
	Expert 1	Expert 2	
1	5	4	4.5
2	5	5	5
3	5	5	5
4	5	4	4.5
5	5	5	5
6	4	5	4.5
7	5	5	5
8	5	4	4.5
9	5	5	5
10	5	5	5
11	5	5	5
12	4	5	4.5
Total mean (ΣM)			57.5

From table 4, the data obtained for the number of items (n) is 12 items, while the total mean(ΣM)is 57.5. After the data is substituted into formula 1, the validity level obtained is 4.8. Based on the criteria in table 1, it shows that$V = 4.8 > 4.5$. Thus, overall the product assessment items meet the very valid category.

The trial results data for practicality testing are presented in Table 5.

Table 5. Data on product practicality and effectiveness

Teacher	Assessment Score

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	Practicality	Effectiveness
1	5	4
2	4	5
3	5	4
4	5	4
5	5	5
6	4	4
7	5	4
8	5	4
9	4	4
10	5	5
11	5	4
12	4	4
13	5	5
14	4	3
15	5	4
16	5	5
17	5	4
18	4	4
Total score (ΣS)	84	76

The practicality trial results data in table 5 show that the number of assessing teachers is (n) = 18 while the total practicality value () = 84. After the values are substituted into formula 2, 4.7 is obtained. This value shows that P = 4.7 > 4.5. Based on the testing criteria in table 2, the product resulting from this development is very practical.ΣS

Furthermore, in table 5, the total effectiveness value () = 76 and the number of assessing teachers (n) = 18 are listed. After these quantities are substituted into formula 3, E = 4.2 > 4.5 is obtained. Thus, the product developed is categorized as effective.ΣN

5. CONCLUSION

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Volume 38 No. 5 2025,

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Based on the research results, it was concluded that the product developed was categorized as highly valid. Furthermore, this product was very practical and effective for measuring and assessing students' soft skills in DTL practical activities.

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