The Readiness of CBT-ADeM Model Training Toolkit for Work Skills in Processing S-TKKS in Vocational Education

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Abstract. This research aims to create training teaching aids that support the development of the CBT-ADeM model which can hone skills in printing carbon composite sheets from TKKS fiber. The research phase began with preparing a TKKS carbon particle chopper and test instruments, to assess the suitability of the tool as a training tool, which was then tested by experts in the field of industrial engineering. Test results using instruments assessed by experts show validation exceeding the Aiken 's-V value > 0.677 by 0.786. In conclusion, the TKKS carbon particle chopper functions well. Can be used in the CBT-ADeM training model for skills in printing carbon composite sheets from SKKS fiber which acts as a piezoelectric sensor material.

Keywords: Training models CBT-ADeM, S-TKKS, Carbon Particle, Piezoelectric.

1 Introduction

Mastery, knowledge, skills and application of knowledge is a working competency that is in accordance with the area of expertise of the vocational education program, where the main aim is to provide skills to students so that they are able to apply the knowledge and skills appropriately in their respective fields. [1], [2].

BPS data for 2022 shows that graduates from mechanical engineering vocational education study programs in the industrial sector can be classified as low, where the majority of graduates are less able to adapt to changes/developments in science and technology that require skills training. Improve their skills by applying various learning models, one of which is the learning-based model. competence [3].

Responding to the challenges of the national and global job market cannot be separated from the importance of curriculum development and learning model approaches, this indicates that the curriculum and learning models in vocational education are always adapted to developments in the needs of the job market and technology [4], [5]. The demands of the industrial revolution 4.0 also integrate universities and industry in the use and development of IT and ICT in learning [6], [7], [8].

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Facing the demands of the world of work for vocational education graduates who have special skills, it is necessary to increase training efficiency in the future. One way is to develop a training model that includes analysis, implementation and evaluation of training. This aims to ensure that students not only acquire new skills, knowledge and attitudes in training but are also able to apply them effectively in the work environment. It is hoped that the factors that influence the success of training can serve as guidelines for conducting more efficient training in the future. [9], [10].

The learning carried out in Vocational Education refers to the applicable KKNI, but the demands of the industrial world require Vocational Education graduates to have the work skill competencies expected by industry, but this can be realized through holding training with SKKNI standards to support an OBE (Outcome Based Education) based curriculum) [11].

The problem that researchers are working on is preparing training equipment as part of the development of Competency Based Training (CBT) - Authentic, Demonstration, and Mastery (ADeM) training model, which is abbreviated as CBT-ADeM, in actualizing the needs study, design, development, implementation and evaluation of the students. composite engineering to answer problems in vocational education in carrying out a curriculum based on Learning Outcomes or OBE and at the same time answering special work competencies in meeting industrial needs and training intended to produce diversified products from waste in the palm oil industry.

2 Methodology

The research method used was a descriptive method, in which validation was carried out for the palm oil empty bunch fiber charcoal powdering machine as part of the CBT-ADeM training model training tool for EFB carbon fiber composite sheet printing work skills. Validation of training equipment (qualification) as an activity to prove that the equipment to be used in training can consistently meet the expected standards and produce products according to predetermined specifications.

Research preparation includes the availability of adequate equipment and training equipment, then validated through evaluation by several experts from various fields such as academics, technicians, laboratory assistants and industry. An assessment of the training equipment will be carried out in August 2023 with direct observation and the use of video media in the evaluation process. Experts provide assessments, input and suggestions on training equipment which is a product of innovation or technology that has been designed.

Validation of appropriate use of the equipment involved 7 (seven) experts, namely 2 (two) experts from academics, 3 (three) experts from technicians and laboratory assistants, and 2 (two) experts from practitioners/industry. After being assessed by a number of experts, the training equipment was evaluated using instruments that had been distributed and analyzed using the expert assessment method, a conclusion was reached, namely that the equipment was approved for use with minor improvements..

The validity of the suitability of using training tools is tested through expert evaluation using a questionnaire to assess your competency. These questionnaires are designed according to the aspects you want to measure, such as construction, use, maintenance and performance. The

use of language in each statement is also a concern for experts to ensure appropriateness and smooth communication.

Overall, this development research was carried out to assess the validation of the tool consisting of 3 (three) variables, namely the TKKS decomposing unit, the TKKS fiber charcoal powdering unit, and the TKKS carbon fiber composite sheet printing unit, but in this article the focus of the study is the usability test, tool for powdering TKKS carbon fiber into particles with each of the 4 (four) assessment aspects consisting of construction, operation, maintenance and tool performance. Table 1 displays the assessment framework for validating the training tool. The data is then evaluated using the V Aiken formula, where if the V value is > 0.677, the research product is considered valid.

Table 1. Validation instrument grid suitable for use as a TKKS carbon fiber particle powdering tool

Variable	Aspect	Statement Items	Items Number	Aiken's-V Average
Validation of the TKKS fiber charcoal powder tool	Construction	10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10.	0,789
	Operation	10	11,, 12, 13, 14, 15, 16, 17, 18, 19, 20.	0,785
	Maintenance	10	21, 22, 23, 24, 25, 26, 27, 28, 29, 30.	0,782
	Performance	10	31, 32, 33, 34, 35, 36, 37, 38, 39, 40.	0,787
Total Items		40		0,786

3 Result and Discusion

Validation results regarding the use of the TKKS carbon fiber particle pounder have been reviewed by experts based on 4 (four) main variables, in terms of construction, operational, maintenance and performance validation assessment results, each of which has ten statements are considered valid and suitable for use, with an average Aiken's V value ranging from 0.782 to 0.789. Overall, the average Aiken's V value of the four variables is 0.786, which shows the validity of the tool in the context of CBT-ADeM model training for work skills in printing carbon composite sheets from SKKS fiber as a piezoelectric sensor material. This information is presented in Table 2 in tabulated form.

Table 2 shows the results of validation of the feasibility of using the TKKS carbon fiber particle powdering tool by experts with the Aiken's V value being the average of the four assessment aspects assessed, declared "Valid" and required for completeness in CBT-ADeM model training for work skills print a carbon composite sheet from SKKS fiber as a piezoelectric sensor material with an Aiken's V value of 0.881, as shown in Figure 1.

Table 2. Validation results for the feasibility of using a TKKS carbon fiber particle powdering tool

Variable	The subject matter being assessed	Statement Items	Aiken's-V Average	Results Aspects of assessment
Validation of the TKKS fiber charcoal powder tool	Construction	10	0,789	Valid
	Operation	10	0,785	Valid
	Maintenance	10	0,782	Valid
	Performance	10	0,787	Valid
	Total Items	40	0,786	Valid

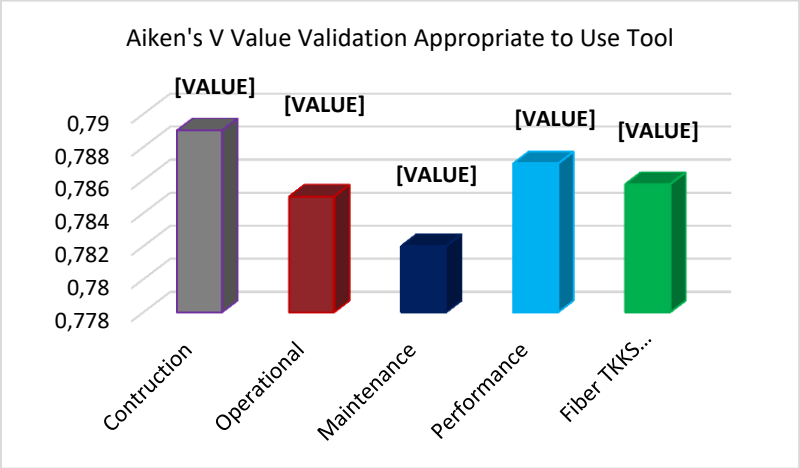

Fig. 1. Average value of Aiken's V, validation of the feasibility of using the S-TKKS carbon particle powdering tool

The results of the design of the TKKS carbon fiber particle powdering tool which will be used in the CBT-ADeM model training for work skills in printing carbon composite sheets from SKKS fiber as a piezoelectric sensor material for vocational education based on the results of validation using the expert judgment method by 7 (seven) experts/ according to Agrawal's statement. T., (2013) [2] In organizing vocational education training, it is recommended to utilize training tools that have been evaluated by experts who have related expertise. This is in accordance with the view Siregar B., et al., (2019) [9] in their study, researchers emphasized that training equipment must be in line with the pattern or form of training carried out in the context of vocational education..

4. Conclusion

The results of the validation analysis and discussion concluded that the training device in the form of a TKKS carbon fiber particle crusher, which will be used in the CBT-ADeM model training to hone skills in printing carbon composite sheets from SKKS fiber as a piezoelectric sensor material in vocational education, is considered suitable for use after passing the test validity. Evaluation by experts using the Aiken validation method showed strong validation

results, with values for construction validation of 0.789, operational 0.785, maintenance 0.782, tools 0.782, and performance 0.787. The variable test results of the TKKS carbon fiber particle pounder showed validity with an Aiken's-V value of more than the threshold of 0.677, namely 0.786.

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