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ANALYSIS OF TEACHING MODULE DEVELOPMENT NEEDS BASED ON TEACHING FACTORY (TEFA) TO IMPROVE ENTREPRENEURIAL CHARACTERISTICS

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Abstract

The aimed of this research was to analyze and describe the need for developing teaching-based modules of Teaching Factory (TEFA) to improve the characteristics of entrepreneurs who are ready to work and produce products that comply with industry standards to support the implementation of the independent curriculum. The research method used was research and development. This research focuses on identifying student teaching module needs that are expected to meet national curriculum standards and regional potential, involving an understanding of the educational context, industry demands, and student needs. The data collection techniques that the researchers used were observation, interview, and questionnaire. The research results indicated that there was a significant need to develop teaching modules so that they can accommodate diverse students' needs customized to the level of difficulty and interest of students. Teaching modules should be designed to provide students with opportunities to develop 21st-century skills such as skills critical thinking, creativity, communication, and cooperation.

Keywords: teaching modules, Teaching Factory (TEFA), entrepreneurship, vocational education

INTRODUCTION

The Merdeka Curriculum is the latest curriculum designed by the Indonesian government to answer the challenges of today's world of education. Article 15 of Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System states that vocational education is secondary education that prepares students primarily to work in certain fields.

Specifically, the welding and metal fabrication engineering skills program at SMKN 1 Sungai Rumbai is to equip students with the skills, knowledge, and attitudes to be competent: 1) work either independently or fill existing job vacancies in the world of business and industry as mid-level workers in engineering, 2) choosing a career, competent, and develop a professional attitude in the field of engineering.

Program skill welding and metal fabrication techniques are one of the expertise programs at SMKN 1 Sungai Rumbai. The objectives of the welding engineering expertise program generally refer to the contents of the national education system law. Education is something inherent and exists in human life itself (Dewi, 2018). Vocational education is secondary education that produces professionals in the field of welding techniques that are oriented toward the needs of the business world. Specifically, the aim of the welding and metal fabrication engineering skills program is to equip students with the skills, knowledge, and attitudes to be competent.

Teaching Factory (TEFA) is a production and business-oriented learning concept to answer the challenges of current and future industrial

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development (Sunggoro et al., 2022; Siswanto et al., 2022; Maruanaya et al., 2021; Pratiwi et al., 2022; Perwiranegara, 2022). TEFA is a learning model that brings an industrial atmosphere to schools so that schools can produce industrial-quality products (Lestari et al., 2021; Dwijayanthi & Rijanto, 2022; Mourtzis et al., 2021; Purwanto et al., 2022).

Education requires media in learning. Learning media enables students to acquire knowledge, skills, or attitudes (Putri et al., 2022; Sulistiyarini et al., 2018; Batubara, 2023; Feladi et al., 2017; Supardi et al., 2023; Arpan & Sadikin, 2020; Hernando et al., 2022). With the learning process of TEFA, students can learn and master skills and abilities according to their competencies which are carried out based on procedures and standard real industrial work (Rohaeni et al., 2021; Setiawan et al., 2022; Dhani & Kristiani, 2021; Wahjusaputri & Bunyamin, 2022). Products made by students as a learning process can also be marketed to the community so that the results can be used to meet school operational costs for learning practices.

METHOD

This research method was research and development. Educational research and development is a process used to develop and validate an educational product, research and development is a process used to develop and validate educational products (Borg & Gall, 1989). The steps in conducting a needs analysis were the identity of learning objectives, understanding of the industry local, survey curriculum, consultation with the factory, project-based learning design, and evaluation and revision.

Development research was not only the development of an existing product but also to finding of knowledge or answers to practical problems. The research subject was class XI Welding and Metal Fabrication Engineering (TPFALO). Data analysis techniques used reduction data, data presentation, and conclusion. Data collection was interviews and needs analysis questionnaires.

Research and development methods are research methods used to produce certain products and test the effectiveness of these products (Sugiyono, 2016). To be able to produce certain products, research using needs analysis (survey or qualitative methods are used) and to test the effectiveness of the product so that it can function in the wider community, research is needed to test effectiveness that product.

Methodologically, research and development have four levels, namely 1) Research and Development at Level 1 (the lowest level) is research for produce design but does not proceed with making the product or testing it, 2) Research and Development at Level 2, where researchers do not conduct research, but directly test existing products, 3) Research and Development at Level 3, where researchers research to develop (revise) existing products, making revised products and testing the effectiveness of these products, 4) Research and Development at Level 4 is research to create new products and test the effectiveness of these products (Sugiyono, 2016).

RESULTS AND DISCUSSION

One of the successes of students in education is demonstrated by their academic achievement. In reality, it was found that the demands for academic achievement on students were getting higher while their learning abilities were mediocre. This is what causes the level of student success in academic achievement to be less than expected by the school, parents, and students themselves (Amar et al., 2016). One of the functions of education is to shape students' attitudes and orientation toward learning, instill a positive attitude and thirst for knowledge, and develop effective learning skills (Amar et al., 2016).

Learning outcomes are influenced by various factors, both internal factors and external factors (Burke et al., 2024; Sinay et al., 2023; Arpan & Marpanaji, 2015; Nyoni et al., 2017; Sari et al., 2023). Internal factors are physiological and psychological factors (for example intelligence, achievement motivation, and cognitive abilities), while external factors include environmental and instrumental factors (for example teachers, curriculum, and learning models) (Amar et al., 2016).

The program rolled out by the government through the education department is an implementation program teaching factory in vocational high schools. A teaching factory is an approach to the learning process in industry-

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based vocational schools, meaning that the school carries out planning, workmanship, and control of products under actual industry standards. The importance of learning the teaching factory is 1) Increasing the competence of teachers and students, 2) encourage the creation of a school-quality culture, 3) Creating an industrial culture in schools, 4) A vehicle for creativity and innovation for students and teachers, 5) A vehicle for creativity and innovation for students and teachers, 6) Means for developing entrepreneurship in schools, 7) internships and accommodation for graduates who have not yet found work in the industrial world of business.

Teaching factory carried out in unit form production or other forms that do not conflict with the rules and applicable legislation and carried out integrated in activities learning or outside of learning. Interviews were conducted with students. The results of the researcher's interview are as follows 1) Students were very interested in welding practice, 2) Students were interested in improving practical-based welding skills in TEFA, 3) Students would benefit from learning-based learning TEFA, 4) Based learning of TEFA made learning more interactive, 5) Students need module-based teaching of TEFA, 6) Students need teaching modules that can be understood independently, 7) Students strongly agree with module-based teaching TEFA as an alternative teaching module to support the welding practice learning process.

Based on the results of observations during the learning process, data was obtained as listed in Figure 1.

TABULASI DATA HASIL PENELITIAN

KELAS X TP FALO

NO	KETERTARIKAN												JUMLAH	%	KATEGORI
1	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
2	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
3	5	4	4	4	4	4	4	4	4	4	4	5	50	83	Tinggi
4	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
5	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
6	4	4	5	5	5	4	4	5	4	4	3	5	52	87	Tinggi
7	5	5	4	5	4	3	5	4	5	3	5	5	53	88	Tinggi
8	4	5	4	3	5	5	3	4	4	4	3	4	48	80	Sedang
9	5	5	4	5	5	5	5	5	4	4	5	5	57	95	Sangat tinggi
10	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
11	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
12	4	4	4	5	4	5	5	5	5	5	5	5	56	93	Sangat tinggi
13	4	4	4	5	4	4	5	4	5	4	5	4	52	87	Tinggi
14	5	5	5	5	4	5	5	5	5	5	5	5	59	98	Sangat tinggi
	66	66	64	67	65	65	66	66	66	63	65	68			
	94	94	91	96	93	93	94	94	94	90	93	97			
	RATA-RATA			94											

Figure 1 The Needs for Teaching Factory-Based Welding Practice

Figure 1 showed that the level of student interest was very high in teaching factory-based welding practices. After these data were collected, researchers conducted further analysis to gain a deeper understanding of the factors that influence interest in teaching factory-based welding practices.

TABULASI DATA HASIL PENELITIAN

KELAS X TP FALO

NO	KEBUTUHAN												JUMLAH	%	KATEGORI
1	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
2	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
3	4	4	5	4	5	3	3	3	3	3	3	4	44	73	Sedang
4	5	5	5	5	5	4	4	4	5	4	4	5	55	92	Sangat tinggi
5	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
6	5	5	5	5	4	4	4	4	4	4	4	4	52	87	Tinggi
7	5	5	4	5	5	5	5	4	5	4	5	4	56	93	Sangat tinggi
8	4	4	4	3	4	4	4	4	5	4	4	3	47	78	Sedang
9	5	4	5	5	5	5	5	5	5	5	5	5	59	98	Sangat tinggi
10	4	4	4	4	4	4	4	4	4	4	4	4	48	80	Sedang
11	5	4	5	4	5	5	5	5	5	5	5	5	58	97	Sangat tinggi
12	4	5	5	4	4	4	4	5	5	5	5	5	55	92	Sangat tinggi
13	4	5	5	4	4	5	4	5	4	5	4	4	53	88	Tinggi
14	5	5	5	5	5	5	5	5	5	5	5	5	60	100	Sangat tinggi
	65	65	67	63	65	63	62	63	65	63	63	63			
	92,9	92,9	95,7	90	92,9	90	88,6	90	92,9	90	90	90			
	RATA-RATA			91											

Figure 2 Tabulation of Research Data on Interest in Teaching Factory-Based Welding Practices

Figure 2 showed the types of needs related to teaching factory-based welding practices, and the number of respondents who expressed these needs. This data can provide insight to researchers about the needs that must be met in developing teaching factory-based welding practices.

Table 1 Categories of Student Needs for the Development of Teaching Modules

Interval	Interpretation	Frequency
90-100	Very high	9
80-89	High	2
65-79	Medium	3
55-64	Low	0
0-54	Very low	0
Total		**14**

By paying attention to these categories, teaching module developers can design materials that are more responsive to student needs and characteristics, and maximize student learning potential. Development research is based on needs in the field, namely the form of conditions desired with that condition found in the field, to overcome this inequality, techniques are needed on how to increase maximum results from

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learning using needs analysis. The teaching module needs analysis in this research is a needs analysis to find out what teaching module models are needed by students. So, it is very important at the beginning to carry out a needs analysis to collect the necessary information.

In the context of product development, needs analysis is a very important part and step. Development research needs to begin with a step where the researcher carries out a needs analysis before product development activities are carried out so that the product to be developed departs from the data resulting from the interpretation of the needs analysis carried out at the beginning. This activity is often interpreted as an initial research activity before researchers determine the type of product to be developed.

This means that needs analysis is an activity to collect information to make a priority decision, and to identify needs that are relevant to learning. Analysis procedures for developing teaching modules based on TEFA using the following steps of **ADDIE**. **Analysis**. Analysis activities of work situations and the environment so that it is determined what needs to be developed. For example, this analysis stage was in an Engineering class Reasoning, we do an analysis, we look at the student's situation, the student seems uninterested and bored, unenthusiastic, lazy, the student even talks to his or her seatmate or next to him.

We look at the situation and conditions, and what products in that class are needed. Maybe we need a product-based TEFA so that students don't get bored when they are interested. This means that later students like. **Design**. Product design activities according to requirements. The teacher made designs for the teaching module. Examples of designs include the teacher providing orientation, and materials, explaining work techniques, preparing practical equipment, carrying out practice, and carrying out assessments.

Development. Manufacturing activities and testing products (expert validation test and trial). The product that has been found was tested, we test a teaching module with experts, it can be corrected, it can be assessed, and it can be given input. The experts were competent in research on based teaching modules TEFA would be better, as it would provide more input into the development of teaching modules designed. Then the next step was revising from the input given by the member earlier. Then do a trial, meaning we try it out in class, usually with experiments. We need a control class and an experimental class. In-class experiments were carried out learning with the model that has been developed. One more class was the control class, in this class, no learning was carried out designed. Here we tested learning in the experimental class and control class and tried to compare which learning results were better and which were more effective.

Evaluation. The activity of assessing whether each step was a successful activity and the products that have made whether it meets the specifications or not. Teachers can give questionnaires to students using the model we developed. Whether students are happy or vice versa, students become stressed, and students become happy. We can also see from the perception teacher, whether the teacher is happy or not, interested or not.

In this research results, the population was 25 students, and the sample was 14 students, 9 students in the very high category, 2 students in the high category, 3 students in the medium category, and none in the low and very low categories. Based on data tabulation, the overall research results showed that in general students tend to be interested in and need effective and efficient teaching modules so that they can help the learning process.

CONCLUSION

Analysis of the needs for developing this teaching module to determine interest and needs analysis, the needs for developing a teaching module based on teaching factory to improve students' entrepreneurial character, competency in welding and metal fabrication engineering skills. From the research also known that it was necessary to develop teaching-based modules of TEFA because many students were interested and needed the development of this teaching factory-based teaching module, the development of this module was suitable for application to students at SMKN 1 Sungai Rumbai in the field of Welding Engineering because it can improve student learning outcomes. Apart from that, it can increase students' competence in entrepreneurship industrial scale.

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