

## **Development Model of Competence Test Expertise for Light Vehicle Techniques for Vocational Teachers**

**Chasan Asyari<sup>✉</sup>, I Made Sudana, Rodia Syamwil**

Universitas Negeri Semarang, Indonesia

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### **Abstrak**

The growth of the automotive industry is growing, so the demands for the availability of skilled vocational graduates are increasing, so that teachers who are competent and productive are needed. The problems that occur are the limited number of productive teachers, so that the competency test development model is needed. The purpose of this study: (1). Knowing the competency profile of TKR teachers, (2). Knowing the results of developing competency test models for vocational school teachers in the TKR field, (3). Conduct the effectiveness test of the development model of the TKR Vocational School teacher competency test. The method used is R & D with design post test-only technique. Tests carried out are tests of validity, normality, and effectiveness. Conclusion: (1). The professional competence profile of TKR teachers in the electricity sector at a fairly good level, (2). Model development is declared valid, so that the competency test model in the form of TKR modules is obtained, especially electricity, (3). The development model is effective in implementing TKR teacher competency tests

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## INTRODUCTION

The growth of the Business World and the Industrial World in Indonesia (DU / DI) is growing, so the demand for skilled labor graduates from Vocational Schools (SMK) is increasing. The position of teachers who are competent and productive, is very strategic in educating the life of the nation. This implies that the availability of the number and quality of competent productive teachers will have a synergic impact in creating quality vocational education. In connection with this, Sadjidan, et al. (2017: 14) concerning several important problems, namely "1). Increasing the competence of productive teachers to suit the needs of DU / DI, 2). Pattern of school collaboration with DU / DI, 3). Teacher internship to industry.

Minister of Industry Airlangga Hartanto stated that "Indonesia's industrial sector is currently able to occupy the top 10 of the world" (<http://www.liputan6.com>, released August 1, 2017). Indonesia has a pretty amazing development in the automotive world. The research included Vijay Rao, with the theme Automotive and Transportation Practice Frost & Sullivan, which stated that (<https://mobilkamu.com> on January 3, 2018): "Indonesia achieved the biggest automotive development in ASEAN. Frost & Sullivan predicts Indonesia will become the automotive market predicted in 2019 with a total of 2.3 million vehicles.

In connection with positive news related to the automotive sector, it means opening employment opportunities for graduates, especially TKR Vocational Schools. Plus, most of these industries would prefer fresh graduates from automotive vocational schools. On the other hand, there are also weaknesses, namely that the quota for new employees is limited. As a result, the requirements will be more complicated and the selection process will be more stringent, so only those who are truly competent can win it

(<https://www.autoexpose.org>, released 2 February 2018).

Efforts to anticipate this, it is appropriate if the Principal increases the competence of TKR teachers, because it is a graduate achievement printer. Furthermore, according to Utomo (2015), "increasing the competence of vocational teachers, especially vocational light vehicle engineering (TKR), needs to be studied on the development of instruments / competency test tools for teachers". Nawawi (2005: 236) revealed, in order to obtain a competency assessment instrument that can measure all activities carried out by TKR practice teachers, so as to be able to identify and measure the results of performance and manage (management) work carried out by the teacher, then: "assessment instruments must be made TKR productive teacher competence with a combination of teacher assignments theoretically, and practice.

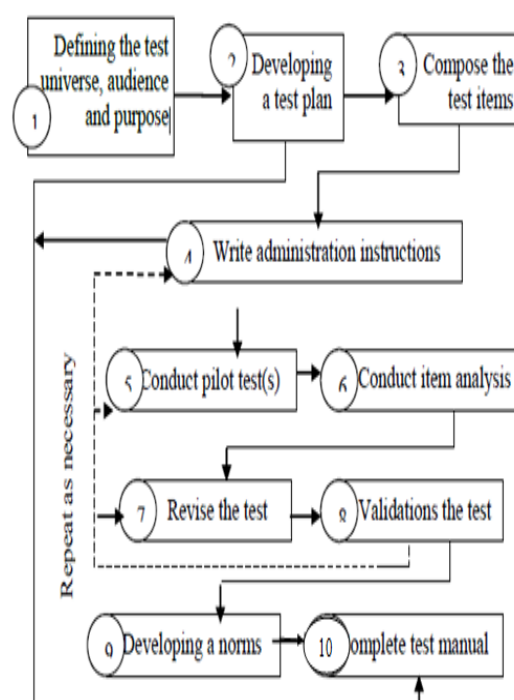
A Based on the sharing above, researchers are interested in conducting research regarding the competence of TKR teachers. This interest is also supported by preliminary studies in the field. At SMK 1 Karangawen there were 6 (six) TKR teachers who passed LSP 4 (four) people. There are also 6 (six) TKR teachers who have passed LSP in Demak 2 Vocational School, only 3 (three) people. Furthermore, in Al Fattah Vocational School there were 3 (three) TKR teachers who passed LSP only 1 (one) person. Ganesha Vocational School there are 5 (five) TKR teachers who pass LSP in only 1 (one) person. At Sunan Kalijaga Vocational School there are 2 (two) TKR teachers who have not passed LSP. The results of this observation show that of the 22 TKR teachers who already had certificates from LSP only 9 (nine) people or only 41%. This condition is interesting for researchers to conduct research regarding teacher competencies. Research is not enough if you do the same thing, but it is necessary to develop the teacher's competency test model.

The reason for the development began with a statement given by Utami (2015: 15), that "development is an activity of science and technology that aims to utilize the principles and theories of science that have been proven to improve the functions, benefits, and applications of science and technology that already exists, or produces a new product ". Regarding the contribution of development research to the world of education, Havis (2013) conducted a study which found that: "Development research has a positive contribution to progress and improvement in the quality of the learning process, because it involves practitioners of education experts, and practitioners from the industry.

On the basis of various problems and reviews above, the objectives of this study are: (1). Analyzing the competency profile of TKR teachers, (2). Test the development of competency test models for vocational school teachers in the TKR field, (3). Conduct the effectiveness test of the development model of the TKR Vocational School teacher competency test.

## METHODS

The method used in this study refers to Research and Development (R & D). The development of this model uses a procedure developed by McIntire (2000) which includes the following 10 stages:



**Figure 1.** Development Procedure Flow Chart

The data analysis technique uses t test. The steps taken to develop the model are: (1). Develop a conceptual model, by identifying the weaknesses of the competency test model that have been applied so far, combining with the existing theories and needs of DU / DI. (2). Develop a hypothetical model, by conducting a model trial, then revising. (3). Developing an empirical model (final model), by conducting validation, due diligence, effectiveness test, then becoming the final product in the form of a learning module.

## RESULT AND DISCUSSION

### Comprehensive Teacher Competency Profil

Teacher competency assessment is carried out by the Head of Vocational Competency (K3) of each school, through the questionnaire instrument, with the following results:

**Table 1.** TKR Teacher Competency Profile for Electricity.

No	School	Level of Competence
1	SMKN 1 Karangawen	Pretty good
2	SMKN 2 Demak	Well
3	SMK Al Fattah	Pretty good
4	SMK Sunan Kalijaga	Pretty good

Source: primary data processed (2019).

Based on table 1 it appears that the competence of TKR teachers in the electricity sector is only SMK 2 Demak which has good competence, this is because in having complete and adequate equipment. Other schools such as SMK 1 Karangawen, Alfattah Vocational School and Sunan Kalijaga Vocational School teachers have competency at a fairly good level. TKR The electricity sector consists of 15 aspects concerning the system: lighting, signs, brake lights and reverse lights, inspection of erasers / glass cleaners, horns, safety, relays, standard bodies, inspection of advans centrifuge (generator) and advans vacuum, and inspection distributor wear.

Constraints faced by TKR teachers in implementing learning are first identifying problems. Based on this, the next step determines the indicator. The indicators / indicators studied are viewed from the student side and from the institution side. Indicators of aspects of students regarding the willingness of students to take lessons, take notes, learn, read automotive books, ask questions, knowledge, analyze. Indicators from the aspect of the institution regarding the quality and quantity of practice equipment, time, availability of learning media, maintenance of tools, difficulties in finding a place of practice, ownership of tools at home, ability of teachers, development of syllabi.

The results of the study prove that the teachers agree that the sincerity and low willingness of students to learn is an obstacle in the learning process. In addition, the teacher stated that he agreed that from the side of the institution it could also be a separate obstacle. For example the availability of equipment and practical equipment. Can be seen in the following picture:

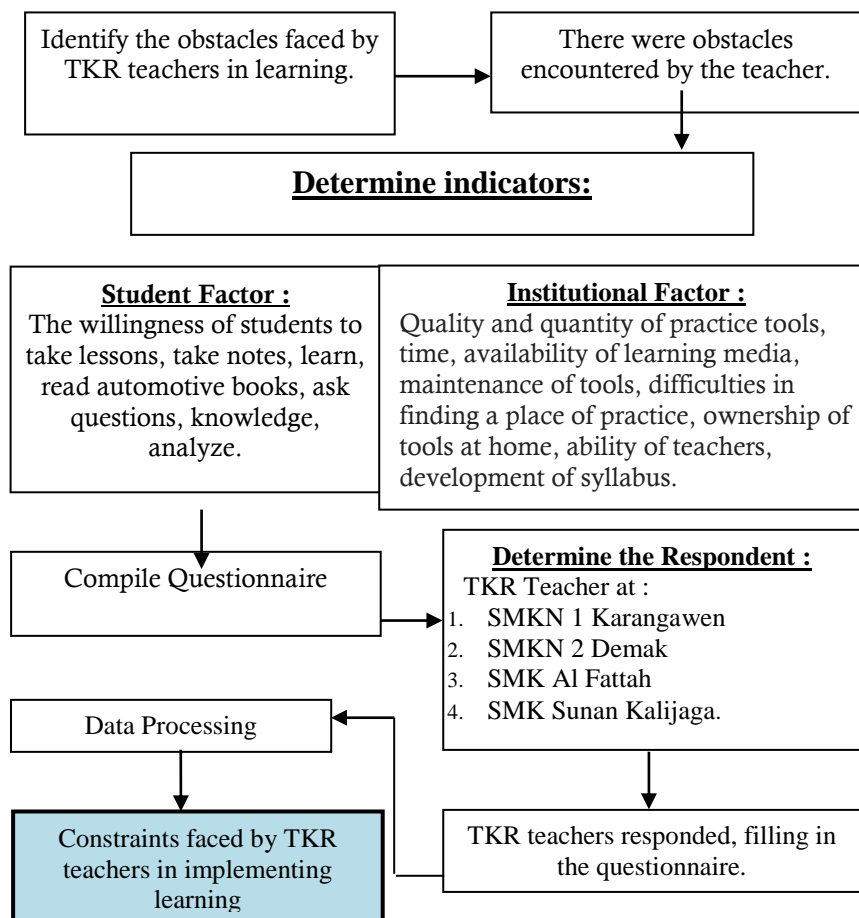


Figure 2. Stages of Knowing the Constraints Faced by TKR Teachers in Implementing Learning

**Development of competency test models for TKR vocational school teachers**

The development of the model in this conceptual and hypothetical models, explained study consisted of the development of below:

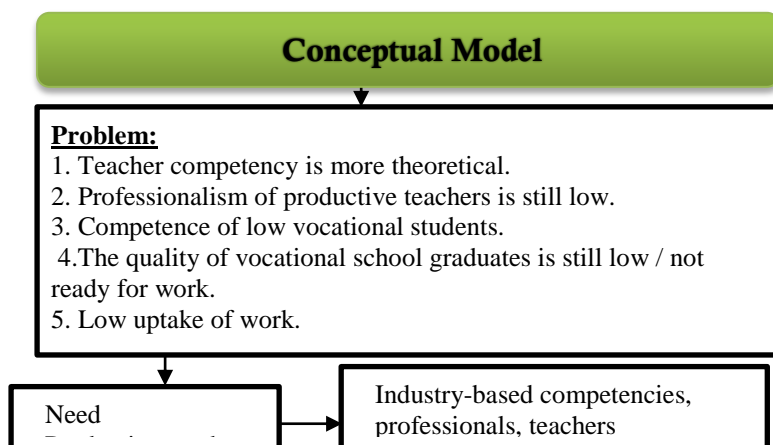


Figure 3. Conceptual Model

The products produced are in the form of with the following framework:  
 TKR Electricity Module for Vocational Schools,

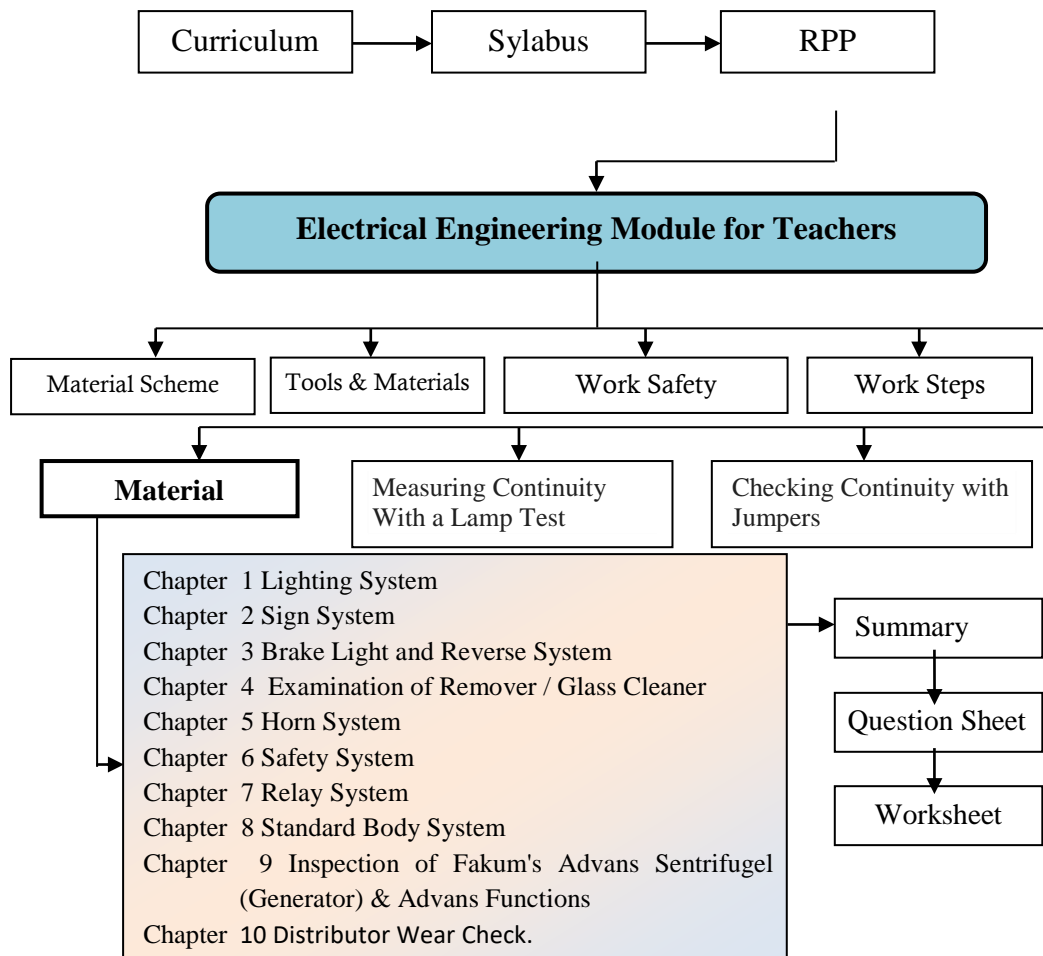


Figure 4. TKR Module for Electricity for Vocational Schools

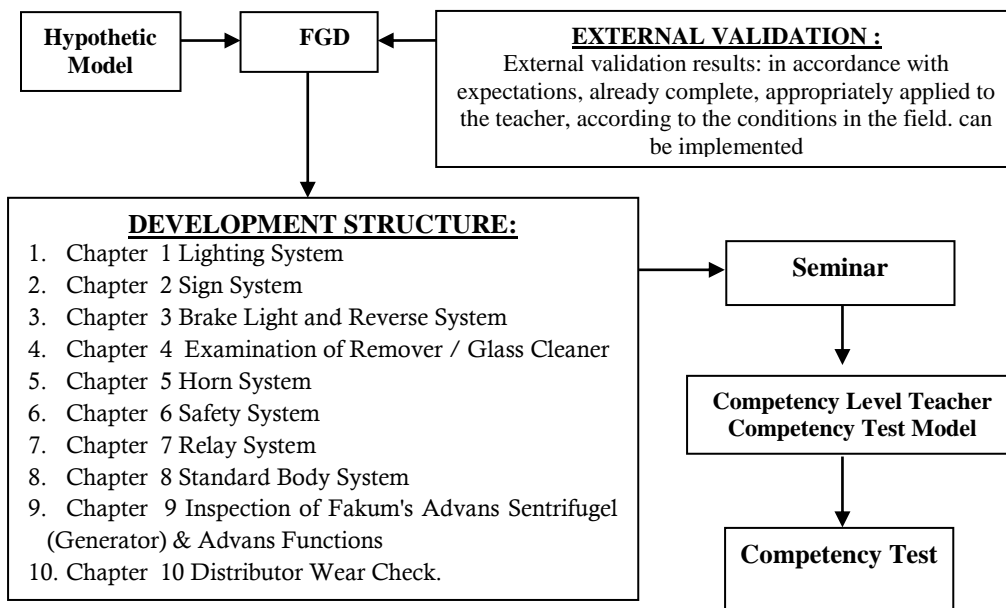


Figure 5. Hypothetic Model

The results of the development of the model are then carried out by the initial step of the validity test, with the following results:

**Table 2.** Model Development Validation Test Results

No	Aspect	Validator			Average	Conclusion
		K3	Teacher	DU/DI		
1	Presentation	3.50	3.25	3.00	3.25	Valid
	Appeal	Valid	Valid	Valid	Valid	
2	Language	3.33	3.33	3.33	3.33	Valid
		Valid	Valid	Valid	Valid	
3	Graphics	3.20	3.40	3.40	3.33	Valid
		Valid	Valid	Valid	Valid	
4	Benefits	3.25	2.88	3.25	3.13	Valid
		Valid	Valid	Valid	Valid	
5	Suitability	3.00	3.00	3.00	3.00	Valid
		Valid	Valid	Valid	Valid	
Average		3.30	3.15	3.25	3.23	Valid
Conclusion		Valid	Valid	Valid	Valid	

Source: primary data processed (2019).

Based on table 2 it appears that the model developed from various aspects was declared feasible by the validator team. The next step is due diligence, with the following results:

**Table 3.** Model Feasibility Test

Aspek	% Appropriateness	The Results
A. Presentation Appeal	60.94	Worthy
B. Language	83.33	Very Decent
C. Graphics	50.00	Worthy
D. Benefits	58.59	Worthy
E. Suitability	75.00	Very Decent

Source: primary data processed (2019).

Based on table 3 the feasibility test of the model shows that from the aspect of language, and suitability is stated to be very feasible. The aspects of attractiveness of presentation, language, graphics, and benefits, are declared feasible by all validators.

### Model Effectiveness Test

The first step taken for the effectiveness test is to do a normality test with the chi square test ( $\chi^2$ ), with the following results:

**Table 4.** Test for the Normality of Competency Test Results Data

Class	$\chi^2$ Count	$\chi^2$ Table
Experimental Class	4,766	3,84
Control Class	4,491	3,84

Source: primary data processed (2019).

Based on table 4, it can be seen that the data from the professional competency test of TKR teachers in the experimental class have  $\chi^2$  count >  $\chi^2$  tables which are  $4.766 > 3.84$  so that the data can be concluded to be normal. The next test in the control class also has a normal distribution of data, because the value of  $\chi^2$  count >  $\chi^2$  table is  $4.491 > 3.84$ .

Effectiveness test was carried out by experimental test type post-test only village control, statistical test t. The selection of the experimental group and the control group was done randomly. The experimental class consisted of 9 (nine) TKR teachers from SMK 1 Karangawen as many as 6 (six) people, and Al Fathah Vocational School 3 (three) people. The control class consists of 8 (eight) people including SMK 2 Demak 6 (six) people, and SMK Sunan Kalijaga 2 (two) people. Based on the results of the calculation, it is known that  $t$  count >  $t$  table ( $17,671 > 1,740$ ). This means that the model developed is effective for conducting competency tests of Vocational School Teachers in TKR fields, especially electricity. Students in acquiring materials and competencies in Light Vehicle Engineering.

## CONCLUSION

The results of the study can be concluded:

- (1). The competency profile of TKR teachers especially the level of competency is only good.
- (2). The results of the development of the competency test model for vocational school teachers in the TKR field in the form of electrical modules for vocational schools.
- (3). The effectiveness test of the development model of the vocational teacher competency test in the TKR field obtained results that the development model was effective in implementing the TKR teacher competency test.

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