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Industry-Oriented Automotive Learning Model to Improve Job Readiness of Automotive Vocational School Students

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ABSTRACT

Work readiness is a measure of the success of learning in vocational high schools (SMK). So far, the work readiness of graduates is still school-oriented, not fully in accordance with industrial needs. This study aims to produce an automotive learning model that is oriented towards industrial needs and to test its feasibility and effectiveness. The research design used was development research with 36 vocational students as subjects. The test object is the Gajah Mada Auto Service workshop and the Daihatsu International Armada Magelang. The research stage includes the development and validation stages. The development stage is to map the competencies needed by the industry and produce a learning model. The validation stage is to test the feasibility of the instrument and the effectiveness of the learning model. The research instrument used is a performance instrument that is used as a measure of the effectiveness of the model. The test results show that the industrial-oriented automotive learning model encourages disciplinary attitudes, responsibility, knowledge of the field of work and skills in the field of work very well over 70%.

Keywords: Industry-Oriented Automotive Learning Model, Job Readiness, Automotive Vocational School

INTRODUCTION

The development and improvement of the quality of learning are the demands of the development of science and technology [1][2]. The development of science and technology implies a consistent and gradual adjustment and improvement of the learning process. Learning innovation and creativity are needed to improve the quality of graduates who are ready to use in the world of work, and increase the competitiveness of human resources[3][4].

One of the educational institutions that is prepared as a forum for improving ready-to-use graduates is a vocational high school (SMK)[5]. SMK is an educational institution at the secondary level that is oriented towards preparing graduates who are skilled and ready to work[6]. According to the Central Statistics Agency (BPS) in 2020 the highest unemployment rate (TPT) is still dominated by SMK, namely 8.49 percent.

The high rate of unemployment is due to the lack of readiness for vocational school students in the industrial world[6][7]. Job readiness is the ability to get or create or do work[8]. The impact of the low employability is low self-confidence, lack of effort and willingness to enter the world of work[9]. Individuals with low job readiness have a more difficult time entering the workforce or finding work[10].

Some of the problems that affect vocational students' job readiness are: (a) the competence of graduates is not optimal[11]; (b) the absorption of SMK and vocational training to the needs of the job is low[12], (c) the relevance of the quality of graduates to the needs of society and industry is low [13]; (d) the industry's concern for SMK in Indonesia is low[14], (e) inadequate learning support facilities and infrastructure [15]. and (f) the academic climate in SMK which is not in accordance with the industrial climate[16]. To overcome the above problems, the quality of learning at SMK needs to be improved so that industry confidence in the competence of SMK graduates which includes attitudes, knowledge and skills increases[17][18]. A learning model is needed that can encourage students to quickly adapt to the needs of the industrial world[19]. Not only that, this learning model must be able to optimize the involvement and role of industry so that industry participation in the quality of SMK graduates is more dominant[20].

Automotive vocational high schools are inseparable from achieving the skills needed by the business / industry world. Automotive vocational schools need to develop learning that is oriented towards improving the quality of attitudes, knowledge and skills that are tailored to the needs of the industrial world[21][22]. Improving the quality and learning process at SMK is carried out by updating learning methods that are more flexible and designed

to foster partnerships with industry[23]. It is necessary to develop industrial-oriented automotive learning that encourages active participation of students, vocational schools and the automotive industry in improving the quality of graduates[24][25]. Industry-oriented automotive learning is not only fully implemented by SMK. SMK and industry play an active role in planning, implementing and evaluating learning[26][27]. Industry-oriented automotive learning encourages sustainable learning patterns and matches the expectations of SMK and industry[28][29].

Planning, implementing and evaluating learning with an industrial-oriented automotive learning model can minimize the low number of graduates, the lack of learning infrastructure, and increase the learning climate in accordance with industry expectations. [11][12][13][14]. Not only that, the involvement of the industrial world can contribute to the formation of vocational school student life skills, so that students' job readiness is better[28] [29].

RESEARCH METHODS

This study uses a research and development approach which aims to develop an automotive learning model oriented to the automotive industry. The development model in this study refers to the Research and Development model from Richey and Klein [32], with development stages including: (1) model development; (2) model validation (internal validation and external validation). The research stages can be seen in Figure 1.

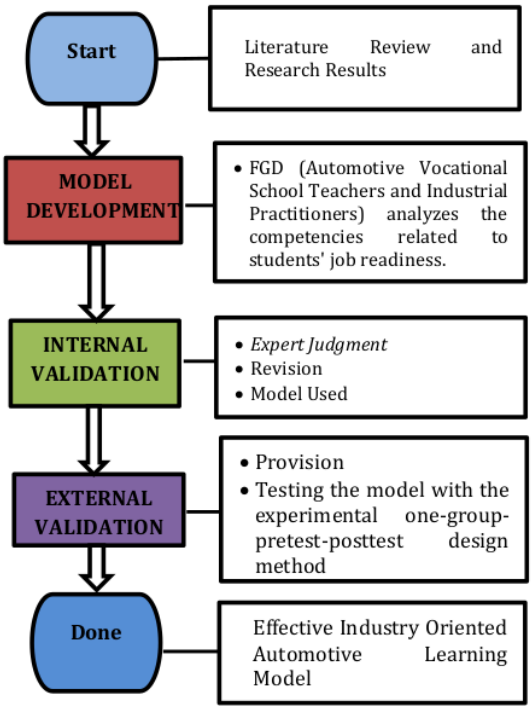

Figure 1. Stages of development research (adapted from [32])

The places chosen for the learning model trials were the automotive industry of PT Daihatsu International Armada Magelang and Gajah Mada Auto Service UGM. The selection of the test site is to consider automotive science which is widely used in automatic vocational schools. The sampling technique used saturated sampling technique, namely the trial sample was all the student population of SMK

Muhammadiyah 1 Salam automotive majors, amounting to 36 students.

The data collection instrument in this study consisted of a performance assessment sheet. The performance appraisal sheet instrument is used to determine the feasibility and test the effectiveness of the learning model.

The effectiveness of the industrial-oriented automotive learning model is determined from the performance assessment instrument in the form of a check list with the rubric provided in the assessment sheet. For indicators of the effectiveness of the model can be seen in table 1.

Table 1. Evaluation criteria and meaning of practice exams

Assessment Norms	Score Range	Criteria
$X \geq \mu + 1.\beta$	X ≥ 3.00	Very Good (SB)
$\mu + 1.\beta > X \geq \mu$	3.00> X ≥ 2.50	Good (B)
$\mu > X \geq \mu - 1.\beta$	2.50> X ≥ 2.00	Not Good (K)
$X < \mu - 1\beta$	X <2.00	Not Good (T)

(Source: [33])

Information:

μ : average overall score of students in one class
: (maximum score + minimum score)

β : standard deviation of overall score
: 1/6 (maximum score - minimum score)

X : scores achieved by students

RESULTS AND DISCUSSION

Research includes model development and model validation. The model development stage begins with a Focus Group Discussion (FGD) which aims to analyze the competencies associated with vocational students' job readiness. The competencies needed to support student work readiness can be seen in Table 2.

Table 2. Work readiness support competencies

Attitude	Discipline Responsible
Knowledge	Field of work
Skills	Field of work Timeliness of Processing

Model validation consists of two stages, namely internal and external validation. Internal validation was carried out to receive input on the feasibility of the model. The feasibility of learning effectiveness models and instruments is evaluated by vocational and industrial learning experts. Input from experts, namely that all industrial-oriented automotive learning activities are adjusted to industry criteria which include: actors, materials, places and learning infrastructure including their assessment.

The next stage is external validation, external validation is carried out twice as the test aims to test the effectiveness of the model.

Table 3. Stages of learning model

Stages	Activity
Preparation	Teachers and industry practitioners together determine learning objectives and prepare for the implementation of learning
Learning Theory	The teacher provides learning material. Industry practitioners

	monitor implementation to keep learning goals achieved.
Practice Learning	The teacher provides learning material. Industry practitioners monitor implementation to keep learning goals achieved.
Internship	Industry practitioners provide learning materials. The teacher monitors the implementation to keep the learning objectives achieved.
Competence test	Teachers and industry practitioners jointly prepare and carry out competency tests.

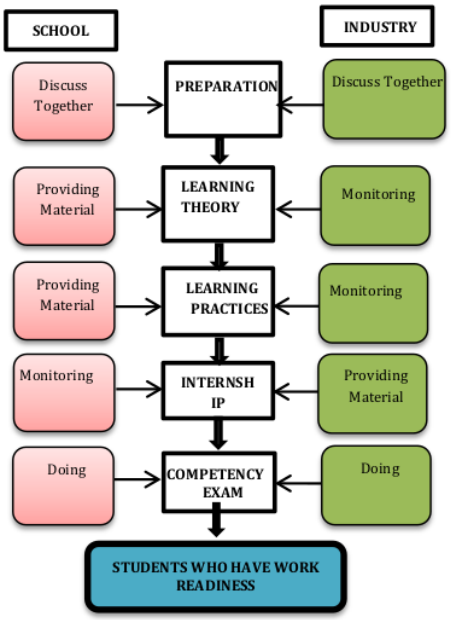

Figure 2. Industry oriented automotive learning model

Discipline

The main description contained in a disciplinary attitude is to carry out work appropriately according to the rules and work safety. The indicator is that students obey the rules, laws and orders regarding work safety and workshop regulations[34].

Table 4. Scores for increasing discipline attitudes

Criteria	Examination 1		Examination 2	
	f	%	f	%
Very Good (SB)	20	56	30	80
Good (B)	16	44	6	20
Good Enough (C)				
Not Good (T)				

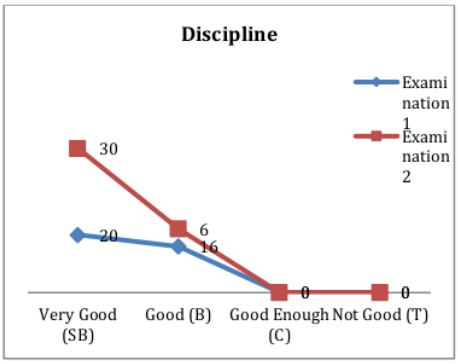

Figure 3. Aspects of discipline attitudes

Responsible

The main description contained in an attitude of responsibility is knowing and carrying out what is done without coercion. The indicator is the students carry out the work until it is finished and tidied up[35].

Table 5. Scores for increasing responsibility attitudes

Criteria	Examination 1		Examination 2	
	f	%	f	%
Very Good (SB)	22	61	32	89
Good (B)	14	39	4	11
Good Enough (C)				
Not Good (T)				

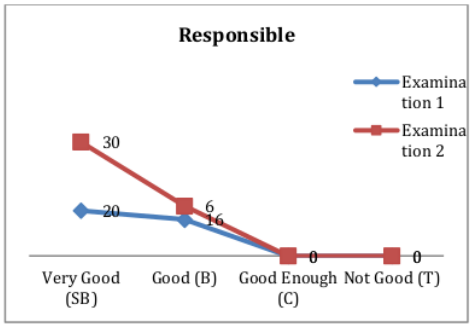

Figure 4. Aspects of responsibility

Knowledge in the Field of Work

The main description contained in knowledge of the field of work is an understanding of the theories related to job competence. The indicator is that students can understand and explain knowledge and material related to job competencies without guidance[35].

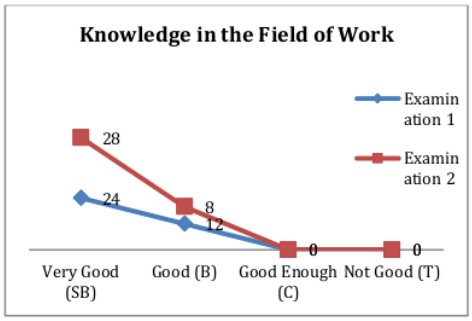

Figure 5. Knowledge aspects in the field of work

Table 5. Knowledge score in the field of work

Criteria	Examination 1		Examination 2	
	f	%	f	%
Very Good (SB)	24	67	28	78
Good (B)	12	33	8	22
Good Enough (C)				
Not Good (T)				

Skills in the Field of Work

The main description contained in skills in the field of work is the skills to complete all work correctly and the results are according to standard operating procedures (SOP)[35][36]. Indicators of skills in the field of work are students who are able to complete all work correctly according to industry standard operating procedures (SOP).

The score for increasing skills in the field of work can be seen in Table 7 and Figure 6.

Table 7. Skills scores in the field of work

Criteria	Examination 1		Examination 2	
	f	%	f	%
Very Good (SB)	25	69	32	89
Good (B)	11	31	4	11
Good Enough (C)				
Not Good (T)				

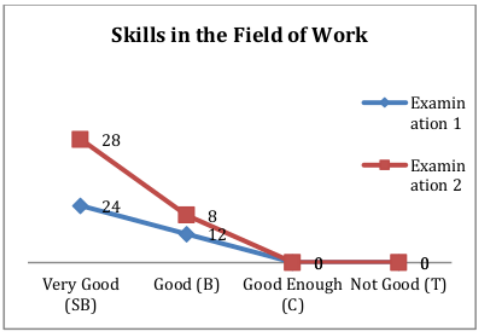

Figure 6. Aspects of skills in the field of work

The results of testing the effectiveness of the model carried out during two trials show that the industrial-oriented automotive learning model can encourage the achievement of competency attitudes of

discipline, responsibility, knowledge in the field of work and skills in the field of work very well. The results of this study are in line with several studies which conclude that learning-oriented or partnering with industry will encourage the attainment of competency attitudes, knowledge and skills of automotive vocational students [37][38][39]. Not only that, the development of industry-oriented automotive learning has a good effect on student work readiness [40][41][42][43].

CONCLUSION

Industry-oriented automotive learning models are produced with development and validation stages. The development stage produces competencies that support work readiness consisting of discipline, responsibility, knowledge in the field of work and skills in the field of work. Meanwhile, validation measures the feasibility of learning models and instruments. The industry-oriented automotive learning model can very well encourage competency achievement during two trials.

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