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## Development of Work-Based Learning Models Based on Work Readiness (WBL-WoRe)

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### ABSTRACT

In recent years, graduates of Vocational High Schools (SMK) still dominate the unemployment rate in Indonesia. Unemployment which is the main problem can be overcome by increasing the work readiness of vocational students with support from industry. The aim of the research is to develop a work-ready-oriented work-based learning model (WBL-WoRe) that is feasible and effective to use to improve the work readiness of vocational students. This research design adopted the Richey and Klein research and development (R&D) design with the stages of model development, internal validation and external validation. The research subjects used were students of SMK Muhammadiyah 1 Salam concentration of automotive engineering expertise, totaling 137 students. The research object is the Ultratune, Astra Daihatsu Magelang and Toyota Nasmoco Magelang workshops. The technique of collecting work readiness data uses observation sheets of attitudes, knowledge and skills. Further analyzed by quantitative methods. This study shows that from the results of external validation (limited and expanded trials) the WBL-WoRe model is feasible and effective in increasing the work readiness of SMK students with a very good category.

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## INTRODUCTION

Educational development in the implementation of vocational education (SMK) has been pursued by vocational education providers to suit the demands of the world of work (Usman et al., 2020) (Azman et al., 2020). The challenges of the world of work with the development of higher work competencies require vocational school administrators to quickly adapt to the demands of the world of work (Baitullah & Wagira, 2019) (Prianto et al., 2020). The adaptation process is carried out so that SMK is able to anticipate and deal with changes that occur by utilizing various existing capabilities. Vocational High School organizers as providers of prospective workers, must be able to utilize their available resources and network of industrial partnership sources effectively (Flynn et al., 2016)

The implementation of SMK so far still needs some improvements. Improvements are needed because several references and data reveal that SMK graduates dominate unemployment in Indonesia (Özdemir & Sahin, 2016). The Central Statistics Agency provides data that as of February 2021 there was an increase in unemployment of 6.93 million (Indriyanto et al., 2021). Even though it is clear, the function of SMK is to prepare students to be able to compete and occupy jobs in accordance with the competencies needed by the world of work. The fact that occurs is inversely proportional to the fact that from year to year there is an increase in the number of unemployed from the SMK level. This situation will be even more difficult because for the past two years, Indonesia has experienced the COVID-19 pandemic which has resulted in the industrial sector experiencing a reduction in workforce or closing (Indriyanto et al., 2021).

Unemployment is a problem that must be addressed immediately, the high unemployment rate will have an impact on the high risk of poverty and crime. The narrowness of available job opportunities followed by the increasing number of SMK workforce and the low work readiness of SMK students will have an impact on the difficulty of getting a job (Millenky, 2016). So that indirectly student work readiness is an important factor in overcoming unemployment problems (S. Muslim et al., 2020) (Mgaiwa, 2021).

Work readiness of vocational students can be improved by improving the quality of student competence in the aspects of skills, knowledge, and attitudes of students' work personalities (Cattaneo et al., 2022) (Simona, 2015). Students who have high job readiness will make students get jobs that are liked, appropriate and successful. To improve the work readiness of vocational students, vocational education providers have attempted to make improvements as a form of increasing student work readiness. This is because a good and optimal learning process will have a significant influence on the quality of vocational education graduates (Dodd et al., 2021) (Susanti et al., 2020).

A culture of innovation or the development of a good learning process is a learning process that involves management, human resources and stakeholders to obtain innovations in appropriate and effective learning models in the implementation of vocational education. The orientation towards the goal of achieving competence in vocational learning has responded to the government giving birth to a link and match policy. Although it is not a new concept in the field of education, this concept is still used as a solution to solve problems or issues that are developing at this time, so that this policy is used as one of the footholds in the principle of implementing vocational education that aligns the development of educational aspects with community development both for the future. now and in the future. Link and match policy for vocational education in Indonesia (Dasgupta & Gupta, 2009).

The implementation of the link and match policy in the implementation of vocational education in Indonesia has undergone many phases of change. Phase changes produce learning models that are expected to fit and meet the objectives of the link and match policy. The key to the link and match policy is

partnership. Currently, the partnership-based model that has been implemented by vocational education providers, one of which is Work-based learning (WBL) or work-based learning. WBL is a learning that positions students as the main subject of learning (Ismail et al., 2015a). Knowledge will be obtained based on experiences in work (Garnett, 2016) (Sudirman & Gemilang, 2020). There is an integration between learning at school and learning in the workplace/industry so that there is continuity with job competition (Desi Aryani & Komar, 2020) (Bezerra et al., 2021). WBL is implemented as a form of learning model that provides actualization of working conditions in theory and practice learning. WBL is not abstract learning because it is oriented to work careers (Major, 2016).

Several research results show that WBL has a positive influence in increasing student work readiness. Work readiness in question is the process of student maturity in obtaining the competencies needed by the world of work so that after graduation students are ready to work (Sudjimat & Tuwoso, 2021) (Nurdiyanto, 2018). Not only that, WBL facilitates SMK students to develop attitudes, knowledge, skills and work behavior in accordance with working conditions so that students can know early on working conditions and activities. (Myint et al., 2021) (Muslim et al., 2019).

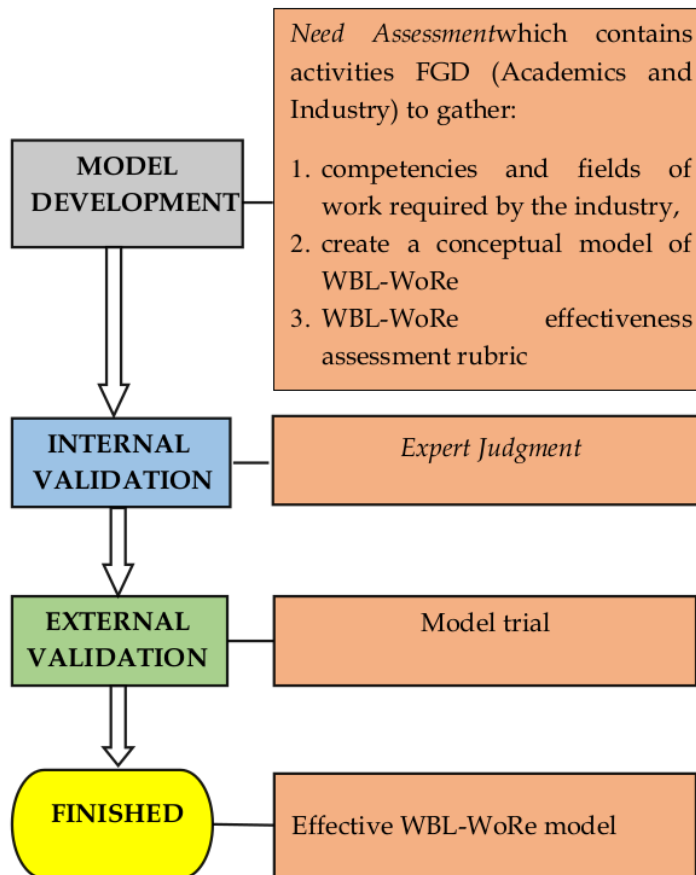
The WBL model that has been applied so far is not without flaws/weaknesses. There are several weaknesses that need to be corrected in order to produce a more effective WBL model. Several studies concluded that these weaknesses include: (1) learning only focuses on one of the selected industries (Finn, 2020) (Helyer, 2015); (2) competence is limited to what the industry teaches (Uzakbaeva & Zholdasbekova, 2015) (Watisin et al., 2015); and (3) the WBL model is implemented in the middle of the implementation of the SMK curriculum, so it is limited by time (Major, 2016). Based on the weaknesses of WBL related to work readiness and concluded by several research results. So it is necessary to make a study/research that aims to minimize these weaknesses so that the expected goals of the WBL model can optimally overcome the problem of work readiness. The WBL that will be developed is a needs-oriented WBL model (Work Based Learning-Work Readiness) or abbreviated as WBL-WoRe. WBL-WoRe was developed to provide benefits for vocational students to gain competence so that it has an impact on increasing work readiness. The characteristics of the WBL-WoRe model are: (1) obtaining knowledge/competence from several industries; (2) being able to choose the competencies desired by SMK students; (3) placed at the end of class IX SMK or after the National Final Examination; and (4) given work readiness materials from the industry in the pre-implementation of WBL-WoRe. The aim of WBL-WoRe is to provide more diverse competencies from various industries, get the opportunity to choose the competencies needed by vocational students and get work readiness materials from industry.

## METHODS

The target of this research is vocational students, vocational teachers and industrial practitioners. The research subjects used in this study were students of SMK Muhammadiyah 1 Salam Magelang with a population of 137 students concentrating on automotive engineering expertise. Considering the state of the pandemic, the sample used is purposive sampling. The number of subjects in the limited trial stage was 5 students, while the expanded trial was 25 students.

This study refers to the Research and Development model from Richey and Klein (2014: 8), with the development stages including: (1) model development; (2) internal validation; and (3) external validation. The stages of the research design :

Figure 1. Research Design



The first stage is the model development stage which aims to formulate the competencies needed to improve student work readiness, the field of work required by the world of work/industry, compile a work readiness assessment rubric and design a conceptual WBL model. The second stage contains an internal validation stage which aims to explore expert input regarding the hypothetical Wo-Re WBL model before being tested. The third stage is the external validation stage which contains limited and expanded trial activities with the aim of seeing the effectiveness of the WBL-WoRe model in increasing student work readiness.

The data collection technique used to see the increase in the work readiness of vocational students is the technical observation of student performance. The job readiness assessment instrument is validated by experts, content validation, revised and then externally validated. Furthermore, the data were analyzed descriptively quantitatively by referring to the rubric of achieving criteria that refers to the Likert scale in Table 1.

Table 1. Meaning of Work Readiness Assessment

Rating Norms	Score Range	Criteria
$X + 1.\beta$	$X > 3.00$	SB
$+ 1.\beta > X \geq \mu$	$2.00 > X \geq 2.50$	B
$> X - 1.$	$2.50 > X \geq 2.00$	K
$X < - 1\beta$	$X < 2.00$	T

DjemariMardapi (2008:123)

Notes:

Very Good (SB); Good (B); Not Good (K); Not Good (T)

Information:

$\mu$  : the average overall score of students in one class

$\mu$  : (max score + minimum score)

$\beta$  : standard deviation of overall score

$\beta$  :  $1/6$  (max score - minimum score)

$X$  : score achieved by students

## RESULT AND DISCUSSION

The first stage in this research is the model development stage with Focus Group Discussion (FGD) activities which aim to formulate student work readiness competencies, fields of work required by the world of work/industry, compile work readiness assessment rubrics and design a conceptual WBL model. FGD participants were teachers of Automotive Engineering Vocational Schools (public and private), totaling 3 people. Academics consisting of 3 lecturers of automotive engineering education. Industrial practitioners consisting of 4 Astra-assisted workshops namely Astra Daihatsu Magelang, Toyota NasmocoMagelang, Ultratune UGM and Otomotif Jogjakarta Center and Service.

Table 2. Competencies Needed by Industry (Results of Need Assessment)

Competence	Competency Aspect	Information
Attitude	Responsibility	Doing the job seriously
	Cooperation	Able to establish good job communication with others to achieve maximum work results
Knowledge	Integrity	Honest and trustworthy
	Field of work	Understand and know the field of work being done.
Skills	Work Process	Able to work with procedures according to standard operating procedures (SOP).
	Punctuality	Complete work correctly and on time.

The results of the FGD concluded that students' job readiness would be formed if the graduates of the automotive engineering vocational school had attitude, knowledge and skill competencies. These results are in accordance with the research. The result of the second FGD is the formulation of a work readiness assessment instrument that aims to measure the effectiveness of the WBL WoRe model in increasing the work readiness of automotive engineering vocational high school students.

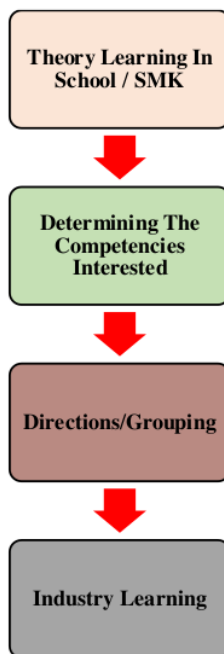
Table 3. Conceptual Work Readiness Assessment Instruments

Competency Aspect	Score	Assessment rubric
Responsibility	1	Do all the work well with guidance
	0	Not executing
Cooperation	1	Maintain good job communication with friends with guidance
	0	Being individual and not able to communicate
Knowledge	1	Understand and be able to explain the field of work with guidance
	0	Can't understand and can't explain.
Work Process	1	Able to work with procedures according to standard operating procedures (SOP) with guidance.
	0	Not doing
Punctuality	1	Complete work correctly and on time
	0	Completing work outside the correct criteria.

The results of the third FGD resulted in five areas of expertise needed by the automotive industry, namely: (1) routine vehicle maintenance; (2) maintenance of vehicle propulsion systems; (3) maintenance of the air

conditioning (AC) system; (4) suspension maintenance; and (5) vehicle body maintenance (painting). Furthermore, the FGD activities were continued with the formulation of a conceptual Work Based Learning and Work Readiness (WBL-WoRe) model which would later be validated internally by experts.

Figure 2. Conceptual WBL-WoRe



The second stage is the internal validation stage which contains validation activities for the WBL-WoRe conceptual model and the rubric for assessing the effectiveness of the WBL-WoRe model by media and material experts. From the expert's observation, there are several evaluations and inputs, namely: (1) The assessment rubric is made into 4 scales and adds integrity as a measured competency aspect, (2) The WBL-WoRe model shown for work readiness should be added with work readiness training. (3) WBL-WoRe which aims to provide diverse competencies, it is better to conceptualize at least 3 industries that are used as places of learning. (4) To provide an update value and novelty of the WBL-WoRe model, it is carried out at the end of class IX learning or after the national final exam.

From the inputs of the validator/expert judgment, there was a change in the student work readiness assessment instrument and the form of the hypothetical WBL-WoRe model.



Table 4. The Hypothetical WBL-WoRe Model of Job Readiness Assessment Instruments

Competency Aspect	Score	Assessment rubric
Responsibility	4	Do all the work well without guidance
	3	Do all the work well with guidance
	2	Not all work is done
	1	Not executing
Cooperation	4	Maintain good job communication with friends without guidance
	3	Maintain good job communication with friends with guidance
	2	Occasionally establish good work communication with friends without guidance
Integrity	1	Being individual and not able to communicate
	4	Carry out all stages of work properly without guidance
	3	Carry out all stages of work properly with guidance
	2	Carry out some of the stages of work well with guidance
Knowledge	1	Not executing
	4	Understand and be able to explain the field of work without guidance
	3	Understand and be able to explain the field of work with guidance
	2	Some understand and are able to explain the field of work without guidance
Work Process	1	Can't understand and can't explain.
	4	Able to work with procedures according to standard operating procedures (SOP) without guidance.
	3	Able to work with procedures according to standard operating procedures (SOP) with guidance.
Punctuality	2	Some are able to work with procedures according to standard operating procedures (SOPs).
	1	Not doing
	4	Get the job done right and finish early
	3	Complete work correctly and on time
	2	Completing work correctly and not on time
	1	Completing work outside the correct criteria.

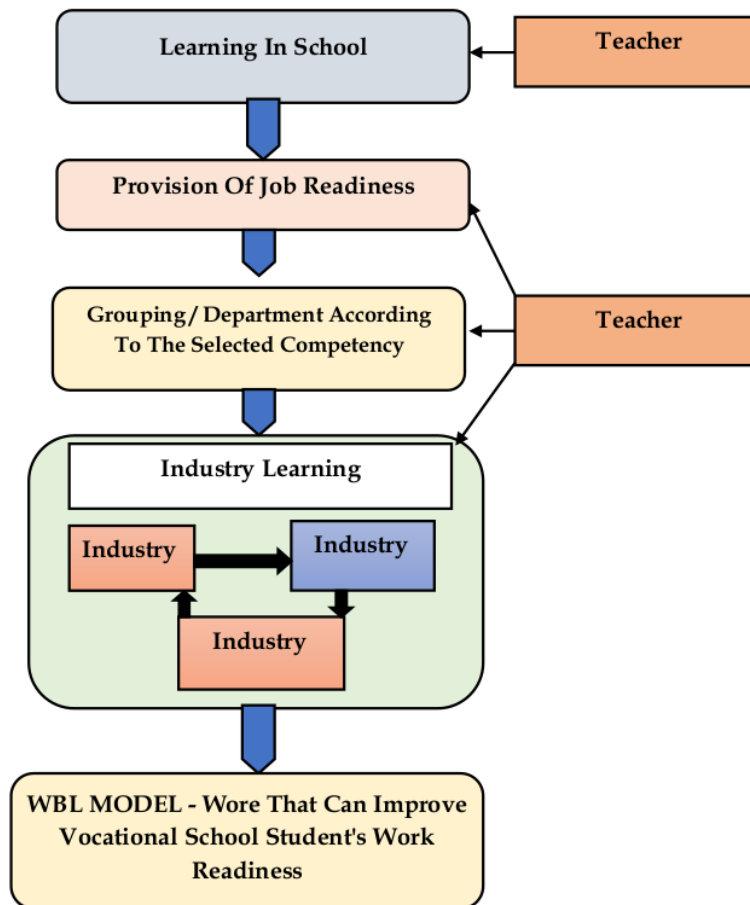


Figure 3. WBL-WoRe Model Hypothetical

After being validated by experts, the job readiness assessment instrument was tested for validity and reliability. Content validity by four experts using Aiken's V coefficient. While reliability using Cronbach's Alpha formula.

Table 5. Content Validity Calculation Results

Item	Validity
Responsibility	high
Cooperation	high
Integrity	high
Knowledge	high
Work Process	high
Punctuality	high

Table 6. Reliability Test

Alpha Cronbach	N item
0,876	6

From the calculation above, it can be concluded that the work readiness assessment instrument has high validity and reliability so that it is feasible and can be used as an instrument for collecting student work readiness data.

The next stage is model testing. The model trial is divided into two stages, namely limited trial and expanded trial. The limited trial was carried out by 5 students with competence in the field of air conditioning (AC) system maintenance work. After a limited trial process, the researcher reflected and came to the conclusion that the WBL-WoRe model could be implemented well by industry practitioners and students. The results of the effectiveness of the model in achieving student work readiness reached an average score of 3.17 with a very good category.

Table 7. Limited Trial Results

Competence	Competency Aspect	Score (f)				Average
		4	3	2	1	
Attitude	Responsibility		4	1		2.8
	Cooperation	3	2			3.6
	Integrity	2	3			3.4
Knowledge	Field of work	1	3	1		3
	Skills					
	Work Process	2	3			3.4
	Punctuality	1	2	2		2.8
	Average Total Score					3.17

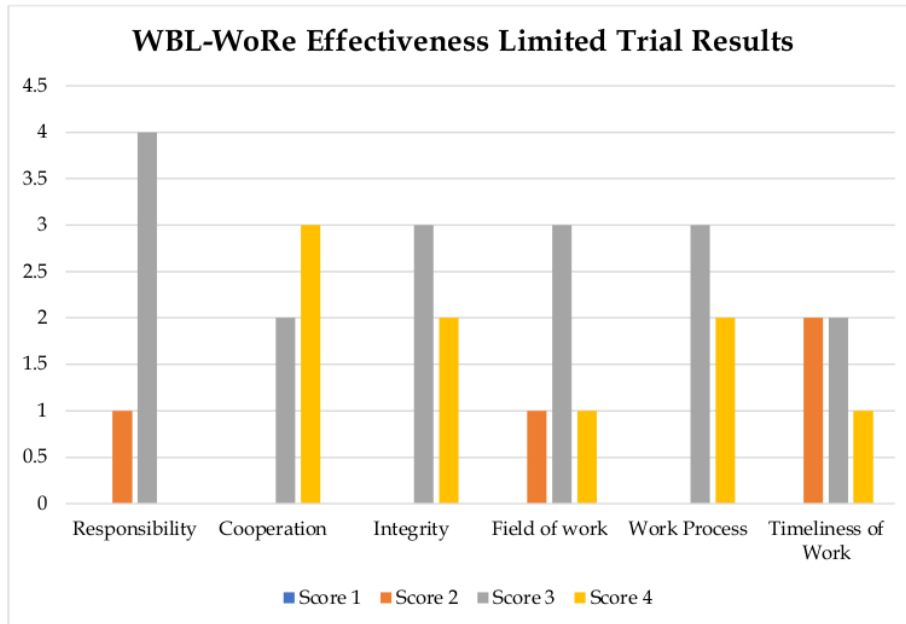


Figure 4. Limited Trial Results

After the limited trial stage and reflection on the effectiveness of the WBL-WoRe model were carried out, the stage was continued with an expanded trial. The subjects of the expanded trial were 25 SMK students. In the expanded trial, it was concluded that the WBL-WoRe model could improve the work readiness of SMK students with an average score of 3.7 in the very good category. The results of the expanded trial can be seen in Table 5 and Figure 5.

Table 8. Extended Trial Results

Competence	Competency Aspect	Score (f)				Average
		4	3	2	1	
Attitude	Responsibility	3	2			3.6
	Cooperation	4	1			3.8
	Integrity	3	2			3.6
Knowledge Skills	Field of work	4	1			3.8
	Work Process	4	1			3.8
	Punctuality	4	1			3.8
	Average Total Score					3.7

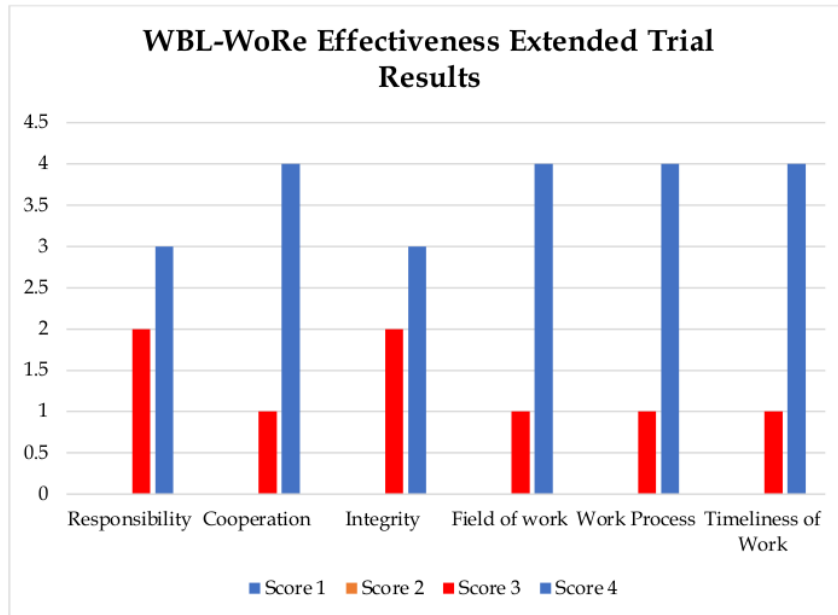


Figure 4. Extended Trial Results

Overall, the comparison of the results of the limited and expanded trials can be seen in Figure 5.

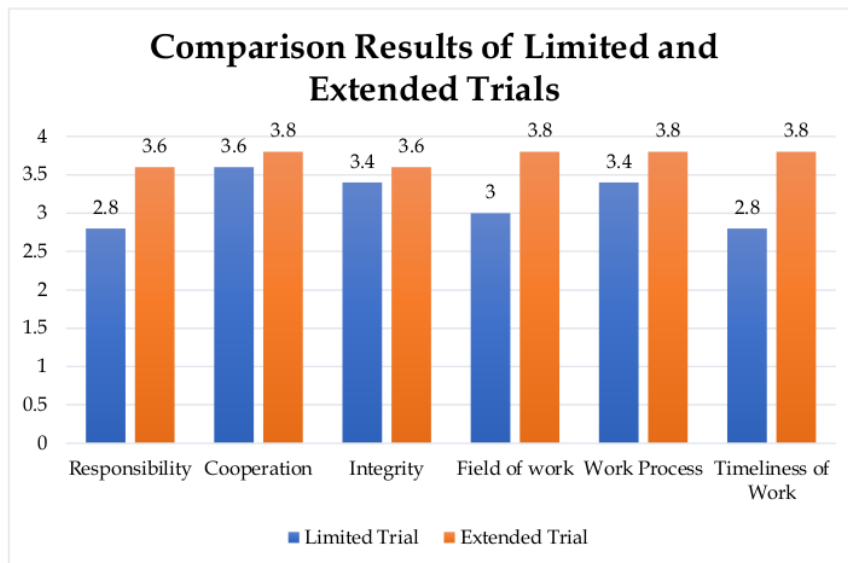


Figure 5. Comparison of Limited Trial and Extended Trial.

The results of the external validation contained no revisions and changes to the work readiness assessment instrument and the stages of the WoRe WBL model. So that the Hypothetical WBL-WoRe model becomes a used WBL-WoRe model and is ready to be applied to improve student work readiness.

The application of the WBL WoRe model can improve students' work readiness which is indicated by improving competency aspects which include responsibility, cooperation, integrity, field of work, work processes and punctuality very well. This is in accordance with the results of several studies, including Marcel M. Robles who stated that industrial-oriented learning can improve the hard skills and soft skills of vocational students (Robles, 2012). Darmawang et al stated that work-based learning can improve job readiness because student employability is formed according to the demands of industrial work (Darmawang et al., 2016) (Rodriguez & Walters, 2017) (Hartanto et al., 2019).

The WBL-WoRe model is a modification of the WBL model that has been applied so far. The goals of WBL-WoRe and WBL have been the same, namely increasing job readiness by preparing students' attitudes, knowledge and skills competencies. Syamhanim Ismail et al researched about WBL by involving two industries called integrated WBL. The results of this study state that the integrated WBL model can improve skill competence in the field of work and work attitudes of SMK students consisting of initiatives (Ismail et al., 2015). Furthermore, Corinne van Velzen et al examined the WBL model using the implementation time at the end of the SMK class which was held in Australia. The results of the study concluded that the Corrine type WBL can improve the job readiness of vocational students (Van Velzen et al., 2012). Budi Tri Siswanto in his research said that a well-implemented WBL can improve the job readiness of vocational students in the automotive sector (Siswanto, 2013). This is in line with Moldovan and Julie et al who state that WBL is effective in shaping attitude, knowledge and skill competencies because students are positioned to learn according to their future work (Moldovan, 2019) (Attenborough et al., 2019).

The implementation of the WBL model so far has several weaknesses that have an impact on the lack of maximum competence in increasing student attitudes, knowledge and skills. According to Taufiq Nur Muftiyanto et al, the implementation of WBL is still hampered by coordination between industry and schools which has an impact on the less than optimal competencies obtained in industry (Muftiyanto et al., 2021). Siegfried Rouvrais et al stated that the WBL model that had been implemented so far was not focused on the competencies needed by the industry. The learning output is still determined by the school (Rouvrais et al., 2020). The WBL model has so far been carried out without debriefing that focuses on determining the division of tasks, objectives and evaluations so that in its implementation it is still not optimal, especially in monitoring and mentoring from industry (Adan, 2021) (Finn, 2020).

Work readiness can be improved by implementing the WBL-WoRe model. Increased work readiness in attitude, knowledge and skill competencies is

achieved because the WBL-WoRe model emphasizes integrated activities and experiences in schools and industry (Helyer, 2018) (Rahdiyanta et al., 2019). The experiences of industrial practitioners and teachers become the latest scientific materials and are needed by the world of work/industry so that students' knowledge and skills increase (Bopardikar et al., 2020) (Schuh et al., 2015). Students are given special debriefing by industry before treatment in industry. The most important stage is that the WBL-WoRe model uses the three industries interchangeably so that attitudes, knowledge and skills can be obtained widely from several industries (Zhang et al., 2016) (Siswanto, 2013). The WBL-WoRe model is applied with careful planning between teachers and industry so that in its implementation it does not cause problems (Guerrero-Dib et al., 2020) (Paquette et al., 2021). Not only that, the involvement of several industries is very useful for adding diverse knowledge/competencies that have an impact on increasing student work readiness (Aini et al., 2016) (Rowe & Zegwaard, 2017) (Helyer, 2018).

## CONCLUSION

Based on the stages of development, internal validation and external validation, the WBL-WoRe model can be implemented properly and improve the work readiness of SMK students. Work readiness is measured by the achievement of a very good category on attitude competence which consists of: aspects of responsibility, cooperation and integrity. In terms of competence, knowledge of the field of work as well as skills in the work process and timeliness of workmanship also reached the very good category.

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