

The Influence of Work-Based Learning (WBL) in the Automotive Service Workshop Production Unit on Vocational High School Students' Readiness for the Workforce

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ABSTRACT

Vocational High School (SMK) graduates in Indonesia, particularly those from the Automotive Light Vehicle Engineering (TKR) programme, continue to experience high unemployment, highlighting the need to improve graduates' work readiness. This study examined the influence of Work-Based Learning (WBL) implemented in the Automotive Service Workshop Production Unit on students' work readiness at SMK YPPT Garut. A quantitative survey was conducted with 58 Grade 12 students and recent graduates who had participated in WBL for at least six months. Data were collected using a validated and reliable Likert-scale questionnaire and analysed through simple linear regression. The findings revealed that WBL significantly improved students' technical competence, soft skills, and psychological readiness for employment ($p < .001$). The coefficient of determination ($R^2 = .603$) indicated that WBL explained 60.3% of the variance in work readiness. These results demonstrate that production-unit-based WBL effectively prepares vocational students for successful workforce transition.

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Introduction

SDG 4 positions quality education as a foundation for sustainable human development, emphasising equal access to learning that supports lifelong skill-building for every individual Forster and Bol (2018). In Indonesia, Vocational High Schools (Sekolah Menengah Kejuruan/SMK) hold a strategic mandate to produce work-ready graduates whose competencies match the needs of the labour market Ariansyah et al (2024). This mandate, however, has not been fully achieved. Data from Indonesia's Central Bureau of Statistics (BPS) show that SMK graduates remained the largest contributor to open unemployment in 2023 at 9.31%, exceeding graduates from general high schools (SMA) at 8.15%. Graduates from the Automotive Light Vehicle Engineering (TKR) programme are among those most affected, largely due to inadequate work readiness upon entering the labour market Lasut et al (2024).

This persistent gap between school output and industry demand stems from multiple factors. The most critical is the mismatch between graduate competencies and actual industry requirements, compounded by rapid technological change in the Industry 4.0 era Niu et al (2024). Beyond technical proficiency, today's employers require graduates who can communicate effectively, adapt to shifting demands, and resolve problems independently-capabilities that theoretical instruction in the classroom cannot build on its own Sutiman et al (2022). Closing this gap requires a curriculum that is dynamically aligned with industry needs and that provides students with authentic work experiences Suhartanta et al (2023).

Work-Based Learning (WBL) has emerged as one of the most effective pedagogical responses to this challenge. WBL situates students within authentic work environments where they develop technical and professional competencies through real tasks and real responsibilities Watisin et al (2015). In Indonesian SMK, one of the most accessible forms of WBL is learning through the school's own production unit, where students serve real customers, perform actual service tasks, and operate under conditions that mirror genuine workplace demands Rosidah and Sutirman (2023). For TKR students, the Automotive Service Workshop Production Unit serves precisely this function, offering structured learning experiences that are directly linked to the automotive service industry.

Despite growing research on WBL and work readiness in Indonesian vocational education, empirical studies that specifically quantify the influence of WBL within school production units on TKR students' work readiness remain scarce. Most studies focus on external industrial internship programmes Sutiman et al (2022) or Teaching Factory models Rosidah and Sutirman (2023), leaving a gap that this study directly addresses. This study therefore aimed to measure the extent to

which WBL implemented in the Automotive Service Workshop Production Unit influences the work readiness of TKR students at SMK YPPT Garut. The findings are intended to provide empirical evidence for WBL policy development and offer practical guidance for school administrators and instructors in optimising production unit-based learning.

Literature Review

Work-Based Learning in Vocational Education

Work-Based Learning (WBL) places students inside genuine occupational settings, where they build job-relevant competencies by carrying out real tasks under conditions that replicate actual workplace demands Watisin et al (2015). Within Technical and Vocational Education and Training (TVET), WBL functions as a bridge between school-based instruction and the real demands of employment, enabling students to convert theoretical understanding into applied occupational competence Thapa (2023). Lim et al., 2020 established that WBL provides authentic workplace experiences that not only develop technical skills but also deepen students' understanding of professional norms and industry culture. Akilova et al., 2021 further confirmed that WBL significantly strengthens soft skills including communication, teamwork, and time management, all of which are prerequisites for sustained employment. In the United States, WBL has become a cornerstone of Career and Technical Education (CTE), with evidence showing measurable positive effects on graduates' career earnings Plasman and Thompson (2023). Saba, (2022) similarly noted that WBL facilitates school-to-work transitions by providing competencies directly relevant to industry demands. Sutiman et al., (2022) found that both industry and education practitioners in Indonesia recognise the critical role of WBL in aligning graduates' skills with real workplace requirements, though implementation gaps remain a persistent concern. More recently, Mayombe, 2024 demonstrated through an empirical study in South Africa that experiential WBL meaningfully develops job-related skills and competencies for youth in TVET settings, reinforcing WBL's cross-contextual relevance.

School Production Units as an Embedded WBL Platform

In the Indonesian vocational education system, school production units represent one of the most institutionally embedded mechanisms for delivering WBL. These units operate as school-based workshops where students engage with actual customers, produce real goods or services, and manage tasks that mirror professional industry standards Rosidah and Sutirman (2023). Unlike external industrial internship programmes, production unit-based WBL occurs within the school's own infrastructure, making it more consistently accessible and easier to supervise Febyola et al

(2025). Daniati et al., (2018) argued that production units are effective platforms for developing competencies across knowledge, attitudinal, and psychomotor domains simultaneously. Research at SMK Negeri 2 Bukittinggi confirmed that the school production unit significantly influences students' work readiness and entrepreneurial spirit Harnety and Almasdi (2022). Nafiah et al., 2020 reported similar findings, noting that learning in production units increases students' practical skills and confidence in facing real-world work demands. In the automotive service context specifically, the production unit requires students to perform vehicle maintenance and repair tasks for real customers, creating an environment that generates authentic accountability a condition that simulated classroom practice cannot replicate Supriyanto et al (2022).

Work Readiness of Vocational Students

Work readiness describes how well-equipped a graduate is across technical ability, interpersonal skills, and professional attitudes to enter and contribute productively within a specific occupational field Pratama and Putra (2024). In Indonesia, work readiness for SMK graduates is formally defined in terms of alignment with the Indonesian National Work Competency Standards (SKKNI), which encompasses cognitive, psychomotor, and affective dimensions relevant to specific fields of expertise. For automotive light vehicle engineering graduates, work readiness specifically requires the ability to complete service tasks with minimal difficulty, to operate in accordance with industry service standards, and to interact professionally with customers Endrastiti and Sholikhah (2024). Supriadi and Haruna, (2023) found that while 75% of automotive vocational students demonstrated good technical skills, only 68.2% achieved adequate work readiness overall, pointing to a gap between technical competence and broader professional preparedness. Nurjanah et al., (2022) established that TKR graduates are considered work-ready when they demonstrate technology adoption, communication, collaboration, and problem-solving abilities aligned with Industry 4.0 demands. Prayogo et al., (2022) further identified practical experience, teacher professionalism, and work motivation as significant contributors to work readiness in the automotive programme, collectively accounting for 30.6% of the variance. Students with high work readiness are consistently shown to secure employment more readily and to perform better on the job than those with lower readiness levels Pratama and Putra (2024).

Theoretical Framework

Kolb's Experiential Learning Theory (ELT) provides the theoretical foundation of this study. The theory maps learning as a four-stage cycle in which students move from hands-on task engagement through critical reflection and conceptual integration, arriving finally at the deliberate application

of refined understanding to new situations Kolb (1984). This framework aligns closely with WBL because it explains how first-hand engagement with real tasks the defining feature of the school production unit progressively builds competencies that transfer to actual employment contexts Mayombe (2024). In WBL implemented through the Automotive Service Workshop Production Unit, students move continuously through Kolb's cycle. They begin with Concrete Experience by performing actual vehicle service and repair tasks for real customers. They then engage in Reflective Observation by evaluating what worked and what requires improvement in their practice. Through Abstract Conceptualisation, they connect their practical experience to technical knowledge and industry standards. Finally, Active Experimentation occurs as they apply these refined understandings to subsequent tasks with greater confidence and competence. This cycle, when repeated across the WBL duration, progressively builds technical competence, soft skills, and psychological readiness for the workforce the three core dimensions of work readiness measured in this study. The theoretical framework positions WBL in the production unit as the experiential input, and work readiness as the measurable outcome, with Kolb's ELT cycle as the explanatory mechanism linking the two variables. Figure 1. Theoretical Framework: WBL in Production Unit, Kolb's ELT Cycle, and Work Readiness (adapted from Kolb, 1984; Mayombe, 2024). Theoretical Framework: WBL in Production Unit, Kolb's ELT Cycle, and Work Readiness presented in Figure 1.

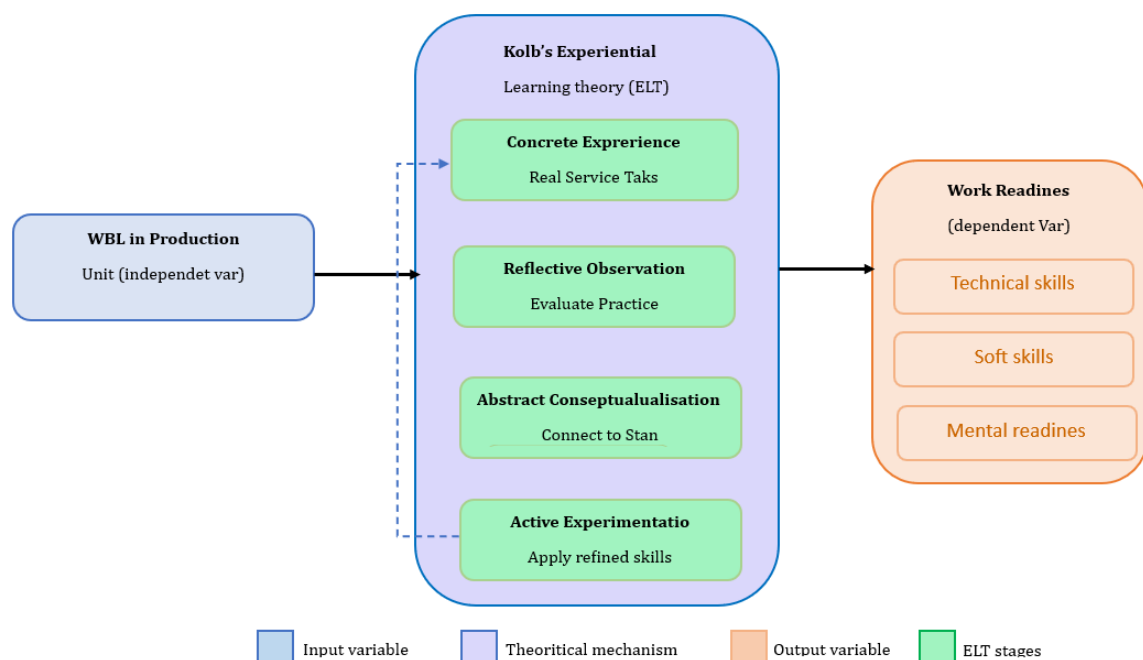


Fig 1: Theoretical Framework: WBL in Production Unit, Kolb's ELT Cycle, and Work Readiness

Method

Research Design

This study employed a quantitative approach with a survey design. Quantitative research applies a deductive-inductive process that begins from a theoretical framework and established expert knowledge, develops specific research problems, and then seeks empirical verification through systematically collected field data Hidayat et al (2024). A survey design was chosen because it allows structured data collection from a defined population through a standardised instrument, making it appropriate for measuring the degree of influence between variables across a target group Creswell and Creswell (2023). This design is well suited to the research objective of quantifying the relationship between WBL participation and work readiness at SMK YPPT Garut.

Population and Sample

The population of this study consisted of Grade 12 students in the Automotive Light Vehicle Engineering (TKR) programme and recent TKR graduates of SMK YPPT Garut who had participated in WBL through the school's Automotive Service Workshop Production Unit. A purposive sampling technique was applied to ensure that only participants with direct and sufficient WBL experience were included in the study Andrade (2021). Two criteria were set for inclusion: first, participants must be enrolled in Grade 12 TKR or have graduated from the TKR programme at SMK YPPT Garut; second, participants must have completed WBL in the production unit for a minimum of six months. The minimum duration criterion was established to ensure that respondents had accumulated sufficient practical exposure to reflect meaningful shifts in their work readiness.

A total of 58 participants met these criteria and were included in the study. This sample size is adequate for simple linear regression analysis, which involves one predictor variable. Hair et al (2010) recommend a minimum of five to ten observations per predictor variable; with one predictor in this study, the minimum requirement is five, which is far exceeded by the 58 participants obtained. The total population of Grade 12 TKR students and recent graduates who had participated in WBL at SMK YPPT Garut during the study period was approximately 80 individuals, giving a sampling coverage of approximately 72.5%, which indicates a high degree of population representation for this institutional context. Table 1 in the Results section presents the full distribution of respondents by grade level and WBL duration.

Instrument

The research instrument was a structured Likert-scale questionnaire developed from established work readiness dimensions — technical skills, soft skills, and mental readiness — as

reflected in the Indonesian National Work Competency Standards (SKKNI). The WBL instrument comprised nine statement items and the work readiness instrument comprised eleven statement items. Scores ranged from 1 (strongly disagree) to 5 (strongly agree). Before distribution, both instruments were reviewed through expert judgment to assess content validity.

Validity was tested using the Corrected Item-Total Correlation method, with items declared valid if their r-count exceeded the r-table value of 0.2542 ($n = 58$, $\alpha = 5\%$). All 20 items across both instruments met this criterion, confirming the instruments' construct accuracy. Reliability was assessed using Cronbach's Alpha, with values of 0.952 for the WBL instrument and 0.951 for the work readiness instrument. Both values exceed the minimum threshold of 0.600 and fall within the 'Very High' reliability category Sugiyono (2019), confirming that both instruments produced consistent responses across the sample.

Data Analysis

Data were analysed using simple linear regression with IBM SPSS version 30.0. Prior to regression, three classical assumption tests were performed. First, a multicollinearity test using the Variance Inflation Factor (VIF) confirmed the absence of multicollinearity ($VIF = 1.000$, $Tolerance = 1.000$). Second, a heteroscedasticity test using a Scatterplot of standardised residuals showed no discernible pattern, confirming homoscedasticity. Third, a normality test using the Normal P-P Plot showed data points distributed closely along the diagonal line, confirming that residuals were normally distributed. With all classical assumptions satisfied, the regression model was deemed appropriate for testing the research hypothesis. The F-test assessed the simultaneous significance of the model, the t-test evaluated the individual significance of the WBL variable, and the coefficient of determination (R^2) quantified the proportion of variance in work readiness explained by WBL participation.

Result and Discussion

Characteristics of Respondents

The respondents of this study were 12th grade TKR students and graduates of the Automotive Light Vehicle Engineering department of SMK YPPT Garut who had undergone practice in the production unit for at least 6 months, then 1 year and more than 1 year. Characteristics of students based on the competence of Automotive Light Vehicle expertise based on grade level. Student characteristics based on skill level and length of learning explain in Table 1.

Table 1. Student characteristics based on skill level and length of learning

Expertise competence	Frequency	Length of WBL learning	Percentage
12 TKRO	24	6 months	(42.4%)
12 TKRO	18	1 Year	(32.2%)
TKRO graduates 1 year	16	>1 Year	(25.4%)
Total	58		(100%)

Table 1 shows that 24 respondents (42.4%) completed six months of WBL, 18 respondents (32.2%) completed one year, and 16 respondents (25.4%) participated for more than one year. All were drawn from SMK YPPT Garut and had direct hands-on experience in the Automotive Service Workshop Production Unit, numbering 58 participants in total.

Descriptive Statistics of Research Variables

This study examined one independent variable (WBL in the production unit) and one dependent variable (work readiness of TKR graduates). Table 2 presents the descriptive statistics for both variables, based on data processed using IBM SPSS 30.0. Descriptive Analysis of Variable Statistics explain in Table 2.

Table 2. Descriptive Analysis of Variable Statistics

Descriptive Statistics			
	Mean	Std. Deviation	N
Job Readiness of Graduates	46.57	6.979	58
WBL in TKR Production Unit	37.07	5.887	58

Table 2 presents the descriptive statistics for both variables. The WBL variable recorded a mean of 37.07 (SD = 5.887), reflecting a moderate-to-high level of WBL engagement among respondents. The work readiness variable recorded a mean of 46.57 (SD = 6.979). The standard deviations indicate sufficient variance in both variables, confirming that the sample did not cluster at a single response level.

Validity and Reliability Test

1. Validity Test

The data obtained in this study include data on student involvement in learning WBL learning in the production unit and work readiness. All of these data are used to determine the achievement of the objectives of this study. The details of each data are described as follows:

a. WBL learning instrument in the production unit

The WBL instrument comprised 9 statement items scored on a 1-to-5 Likert scale. Prior to data collection, all items underwent expert judgment review to assess content validity. The validity test was conducted using SPSS 30.0. Items with r-count exceeding the r-table value were classified as valid. Table 3 presents the full results. Validity Test Results of WBL Learning in Production Unit (X) explain in Table 3.

Table 3. Validity Test Results of WBL Learning in Production Unit (X)

Item	Value Corrected Item Total Sig. r	Sig.	r table	Criteria
	table Criteria Correlation/r count			
WBL_1	1.00	0.001	0.2542	Valid
WBL_2	0.603	0.001	0.2542	Valid
WBL_3	0.282	0.032	0.2542	Valid
WBL_4	0.541	0.001	0.2542	Valid
WBL_5	0.362	0.005	0.2542	Valid
WBL_6	0.429	0.001	0.2542	Valid
WBL_7	0.572	0.001	0.2542	Valid
WBL_8	0.316	0.016	0.2542	Valid
WBL_9	0.485	0.001	0.2542	Valid

All nine WBL items in Table 3 achieved r-count values above the 0.2542 threshold, confirming their validity for measuring students' WBL engagement in the production unit.

b. Work Readiness Instrument for Graduates of SMK TKRO

The work readiness instrument comprised 11 statement items on the same 1-to-5 scale. Expert judgment was also applied before distribution. Validity was tested identically using SPSS 30.0; items meeting the r-count threshold were retained. Table 4 presents the validity results. Result of Validity Test of Job Readiness of SMK TKRO Graduates (Y) explain in Table 4.

Table 4. Result of Validity Test of Job Readiness of SMK TKRO Graduates (Y)

Item	Value Corrected Item Total	Sig. r	Sig.	r table	Criteria
	table Criteria Correlation/r	count			
KRJ_1	0.499		0.001	0.2542	Valid
KRJ_2	0.606		0.001	0.2542	Valid
KRJ_3	0.538		0.001	0.2542	Valid
KRJ_4	0.505		0.001	0.2542	Valid
KRJ_5	0.485		0.001	0.2542	Valid
KRJ_6	0.542		0.001	0.2542	Valid
KRJ_7	0.544		0.001	0.2542	Valid
KRJ_8	0.553		0.001	0.2542	Valid
KRJ_9	0.596		0.001	0.2542	Valid
KRJ_10	0.492		0.001	0.2542	Valid
KRJ_11	0.619		0.001	0.2542	Valid

All eleven work readiness items in Table 4 similarly exceeded the 0.2542 threshold, verifying the instrument's construct accuracy for measuring graduate readiness across the three dimensions.

2. Reliability Test

Reliability was assessed only on items that had passed the validity test. The analysis applied Cronbach's Alpha using IBM SPSS 30.0, which measures the internal consistency of responses across all items within each instrument. An Alpha value at or above 0.600 indicates acceptable reliability. Table 5 presents the reliability classification used in this study, following Sugiyono, (2019). Instrument Reliability Level explain in Table 5.

Table 5. Instrument Reliability Level

Instrument Coefficient r Level	Reliability
Between 0.800 to 1.000	Very high
Between 0.600 and 0.800	High Moderately Low Very low
Between 0.400 to 0.600	Fair
Between 0.200 to 0.400	Low
Between 0.000 and 0.200	Very low

The following are the results of the reliability test of the questionnaire for WBL learning in the SMK Production Unit and Work Readiness of students graduating from SMK TKRO. Reliability Test Results explain in Table 6.

Table 6. Reliability Test Results

No	Variable	Alpha coefficient	Interpretation
1	WBL	0.952	Very high
2	KRJ	0.951	Very high

Table 6 shows that both instruments achieved Cronbach's Alpha values well above the 0.600 threshold: 0.952 for the WBL instrument and 0.951 for the work readiness instrument. Both figures fall within the Very High reliability category, confirming that the questionnaires produced stable and consistent measurements across all 58 respondents.

Hypothesis Test Results

1. Classical Assumption Test Results

This study employed simple linear regression analysis, as the research design involves one independent variable (WBL in the production unit) and one dependent variable (work readiness). All stages of the regression process were computed using IBM SPSS version 30.0, as presented in the following stages:

a. Classical Assumption Test Results

Multicollinearity Test Results

The multicollinearity test examined the Variance Inflation Factor (VIF) and Tolerance values. A model is free from multicollinearity when Tolerance exceeds 0.100 and VIF remains below 10.00.

Multicollinearity Test Results

Table 7. Multicollinearity test results

Variable	Tolerance	VIF
WBL learning in the Production Unit	1.00	1.00

As shown in Table 7, both Tolerance and VIF values equal 1.00, which comfortably satisfies the multicollinearity-free thresholds. The regression model therefore contains no multicollinearity between predictors.

Heteroscedasticity Test Results

Heteroscedasticity testing is done by making a Scatterplot between residuals and predicted values of the dependent variable that has been standardised. Heteroscedasticity test results explain in Figure 2.

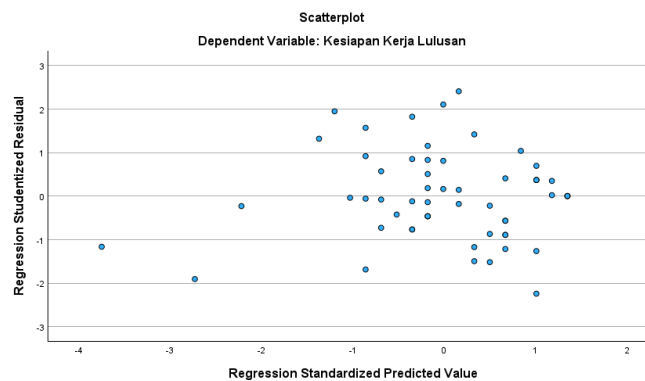


Fig 2: Heteroscedasticity test results

Figure 2 shows that the residual points in the Scatterplot are scattered randomly without any discernible pattern or directional trend. This random distribution confirms homoscedasticity, meaning the variance of residuals remained constant across the range of predicted values. The heteroscedasticity assumption is therefore satisfied.

2. Normality Test Results

Normality Test Results

Normality of residuals was assessed using the Normal P-P Plot. In this approach, residuals that align closely along the diagonal reference line indicate a normal distribution, while residuals that deviate substantially from that line suggest non-normality. As shown in Figure 3, the data points from this study distributed along the diagonal in a consistent pattern, confirming that residuals met the normality assumption required for OLS regression.

The F-test result confirmed model-level significance: F-count (229.441) exceeded F-table (4.01) at a significance value of 0.001, which is below the 0.050 threshold. This indicates that the regression model as a whole is statistically valid for explaining the influence of WBL in the production unit on the work readiness of TKR graduates at SMK YPPT Garut. P-P Plot Normality Test Results explain in Figure 3.

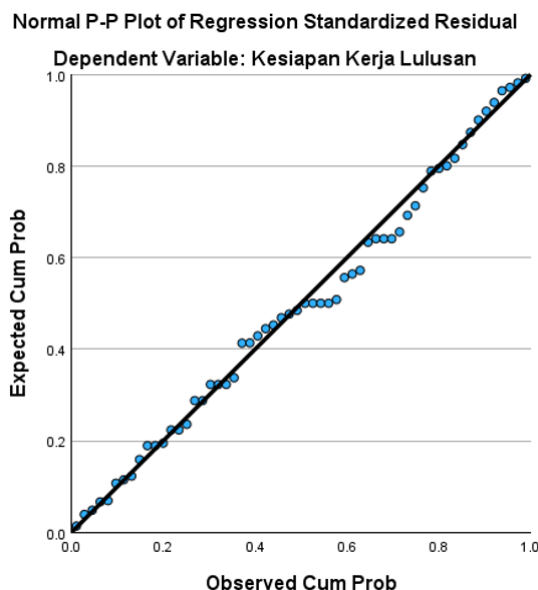


Fig 3: P-P Plot Normality Test Results

The t-test assessed the individual significance of the WBL variable. The decision rule requires t-count to exceed t-table at a significance level below 0.050. In this study, t-count (2.742) exceeded t-table (1.671) with a significance value of 0.001, confirming that WBL in the Vocational Workshop Production Unit has a statistically significant individual effect on the work readiness of TKR graduates at the 5% significance level. The coefficient of determination ($R^2 = 0.603$) indicates that WBL in the Vocational Workshop Production Unit accounts for 60.3% of the variance in students' work readiness. The remaining 39.7% reflects the contribution of variables not included in this model, which are explored further in the Discussion section.

In summary, the hypothesis that WBL in the Vocational Workshop Production Unit positively influences students' work readiness is confirmed. The F-test, t-test, and R^2 results collectively establish that the model is statistically valid, the effect is individually significant, and WBL accounts for 60.3% of the variance in work readiness among TKR graduates of SMK YPPT Garut. The results of the hypothesis test calculation show that the work readiness of SMK YPPT Garut students is influenced by WBL Learning in the Vocational Workshop Production Unit by 60.30%, this result means that student work readiness based on the contribution of these variables contributes so much that it is needed.

Discussion

The finding that WBL in the Automotive Service Workshop Production Unit explains 60.3% of variance in work readiness provides strong empirical support for the central hypothesis of this

study. This result is consistent with and extends prior research. Nafiah et al., 2020 reported that production unit learning increases practical skills and work readiness among SMK students. Harnety & Almasdi, 2022 found a positive and significant effect of the production unit on work readiness at SMK Negeri 2 Bukittinggi. The present study advances these findings by providing a specific regression coefficient ($R^2 = 0.603$) for the automotive service production unit context, offering a more quantitatively precise estimate of WBL's contribution than has been previously reported in the Indonesian automotive vocational education literature. Unlike the Teaching Factory model, which integrates full industrial production cycles within the school environment, or external internship programmes that place students at industry sites, WBL in the school production unit is distinctively accessible and continuously supervised by school instructors. This proximity enables more immediate and consistent feedback compared to off-site placements. The R^2 value of 0.603 obtained in this study is notably comparable to figures reported in Teaching Factory research (Rosidah & Sutirman, 2023), suggesting that school-based production unit WBL can deliver outcomes of similar magnitude without requiring students to leave the school environment. Figure 4 summarises the overall research result model, depicting the quantified influence of WBL on work readiness and the identified factors contributing to the unexplained variance. Research result model; WBL Influence on work readiness explain in Figure 4.

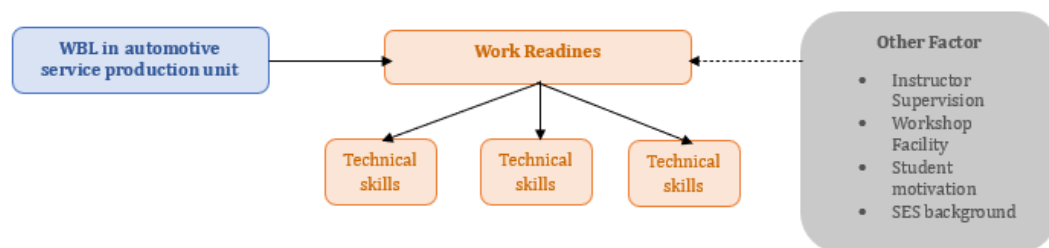


Fig 4: Research result model; WBL Influence on work readiness

The finding is also consistent with international evidence. Suyitno et al., 2025 demonstrated that WBL directly influences vocational identity, which in turn drives employability skills among Indonesian university students. GERÇEK and ÖZVEREN (2024) found that WBL through internship experiences significantly improves career-related skills including communication, networking, and job search effectiveness. The current study extends these international findings to the school-based production unit context at the secondary level, showing that even without external industrial placement, structured WBL within the school's own workshop environment can produce a comparably strong influence on work readiness.

Concerning the 39.7% of unexplained variance, this study acknowledges that work readiness is a multi-dimensional construct shaped by factors beyond WBL participation alone. Three factors in particular warrant careful attention. First, instructor supervision quality plays a central role. Structured, task-specific feedback from instructors with active industry experience directly shapes students' technical confidence, professional attitudes, and ability to self-correct errors during service tasks. When feedback is timely and anchored to real customer service outcomes-rather than generic evaluation -students advance more effectively through Kolb's reflective observation stage, building the metacognitive awareness that underpins long-term work readiness Prayogo et al (2022). Second, workshop facility conditions matter considerably: students working with equipment aligned with current automotive industry standards develop more industry-relevant technical competencies than those trained on outdated tools Kholifah et al (2025). The quality and currency of the production unit's equipment therefore function as an enabling condition for WBL effectiveness. Third, student-level factors such as learning motivation, self-efficacy, and socioeconomic background contribute to how intensively students engage with WBL activities Supriyanto et al (2022). Students with higher intrinsic motivation tend to invest more deeply in the Kolb cycle's experimentation stages, producing stronger readiness outcomes.

Student learning styles represent an additional variable warranting attention in future WBL research. Within Kolb's ELT framework, students differ in their preferred entry points into the learning cycle: some engage most readily through concrete, hands-on experience, while others benefit more from structured reflection or abstract problem-solving. In the production unit context, students who prefer experiential entry points are likely to thrive immediately, whereas those with more reflective or conceptual learning preferences may require additional instructional scaffolding to fully benefit from WBL activities. Future studies should examine whether tailored pedagogical support for different learning style groups strengthens the overall effectiveness of production unit-based WBL in developing both technical and psychological work readiness.

The current sample is drawn exclusively from SMK YPPT Garut, which limits the external validity of the findings. Schools with different resource levels, supervision structures, and instructor qualifications may produce different R^2 values. Future research using multi-school designs would allow examination of how production unit quality moderates the WBL-work readiness relationship across different SMK contexts.

Additionally, 85% of respondents in this study reported that WBL was very helpful in improving their technical skills in vehicle service and repair, while 78% stated that hands-on production unit

experience made them better prepared for real work demands. These perceptions align with the statistical findings and confirm that the impact of WBL is meaningful not only in quantitative terms but also in how students subjectively experience their own preparation for the workforce. This dual-level confirmation statistical significance alongside high rates of perceived relevance strengthens the practical implications of the findings for school administrators and policymakers.

Conclusion

This study demonstrated that Work-Based Learning (WBL) implemented in the Automotive Service Workshop Production Unit significantly influences the work readiness of TKR students at SMK YPPT Garut. The regression analysis confirmed a statistically significant relationship ($F\text{-count} = 229.441 > F\text{-table} = 4.01$; $t\text{-count} = 2.742 > t\text{-table} = 1.671$; $p = 0.001$), with WBL accounting for 60.3% of the variance in work readiness ($R^2 = 0.603$). Through structured engagement in the Kolb experiential learning cycle moving from concrete vehicle service tasks to reflective observation, abstract conceptualisation, and active experimentation students developed meaningful gains in technical competence, soft skills, and psychological readiness for the world of work. The pattern of findings is theoretically coherent with Kolb's ELT cycle and corroborated by both national research on Indonesian SMK production units and international WBL studies.

To strengthen WBL programme quality in the automotive service production unit, schools should take the following concrete steps. First, instructors supervising WBL must possess current industry experience and should receive periodic refresher training to ensure that their feedback to students reflects actual industry standards. Second, workshop equipment must be maintained and updated to match the technology currently used in the automotive service industry; outdated tools limit the authenticity of the learning environment and reduce the relevance of students' practical experience. Third, schools should set a structured minimum WBL duration and evaluate whether extended participation beyond six months produces measurably stronger readiness outcomes. Fourth, periodic competency assessments during WBL should be implemented to identify and address skill gaps before graduation. Fifth, structured reflection sessions aligned with Kolb's reflective observation stage should be integrated into WBL activities to help students process and internalise their learning more deeply.

The remaining 39.7% of unexplained variance indicates that work readiness is shaped by multiple interacting factors beyond WBL participation alone. Future research should investigate the roles of instructor supervision quality, workshop facility conditions, student learning styles,

motivation, and socioeconomic background through multi-variable designs. A longitudinal study tracking graduates' actual job placement rates and early career trajectories would provide stronger evidence of the long-term workforce impact of production unit-based WBL. A multi-school comparative design would also allow researchers to examine how variation in production unit quality and institutional resources moderates the WBL-work readiness relationship across different SMK contexts in Indonesia.

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