



The Effect of Learning Environment on Vocational High School Students' Work Readiness with Work Motivation as a Mediating Variable and Gender as a Control Variable

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Abstract

This study examines the effect of Learning Environment on Work Readiness of Vocational High School (SMK) students, with Work Motivation as a mediating variable and Gender as a control variable. A quantitative approach was employed using primary data collected from 204 Grade XII students from several vocational schools in Bandung Regency via purposive sampling and questionnaire. Conditional Process Modeling (CPM) through PROCESS Hayes Model 4 in SPSS was applied for data analysis. Results show that: (1) Learning Environment has a significant positive direct effect on Work Readiness ($\beta = 0.192$; $p = 0.001$); (2) Learning Environment significantly influences Work Motivation ($\beta = 0.492$; $p < 0.001$); (3) Work Motivation has a very strong positive effect on Work Readiness ($\beta = 0.889$; $p < 0.001$); and (4) Work Motivation partially mediates the relationship between Learning Environment and Work Readiness (indirect effect = 0.437; 95% CI [0.261; 0.582]). Gender functions as a significant control variable ($\beta = -1.180$; $p = 0.009$). The model explains 66.1% of variance in Work Readiness ($R^2 = 0.661$). These findings imply that improving student work readiness requires not only enhancement of the learning environment but also systematic strengthening of work motivation.

Keywords: Learning Environment; Work Motivation; Work Readiness; Mediation Analysis; Vocational School

1 Introduction

Work readiness is one of the critical outputs of vocational education, reflecting the extent to which graduates are able to meet the demands of the industrial world. The persistently high unemployment rate among vocational high school (SMK) graduates in Indonesia indicates that technical competence alone is insufficient to guarantee readiness for employment. In an increasingly competitive labor market, SMK schools are required to equip students not only with vocational skills but also with work orientation, motivation, and psychological maturity as primary capital for entering the job market.

The learning environment plays a strategic role in shaping students' work readiness. A conducive environment that is relevant to the industrial world and supportive in a pedagogical sense is believed to enhance competence while fostering intrinsic student motivation (Billett, 2011). Work motivation, as an internal psychological factor, is regarded as the mechanism that transforms learning experiences into actual readiness to work (Ahmad et al., 2020).

A number of previous studies have shown that work motivation plays a significant mediating role between external factors and vocational students' work readiness (Wahyono, 2017; Mutoharoh & Rahmaningtyas, 2019). However, specific studies that position the learning environment as the primary predictor with work motivation as mediator and gender as a control variable remain limited, particularly within the Indonesian context. This study addresses that gap by empirically testing a mediation model through the Conditional Process Modeling approach. The contribution is twofold. Conceptually, it isolates the learning environment - rather than the broader school or family environment examined in prior studies - as the sole focal predictor operating through work motivation. Methodologically, it estimates this mediation jointly with gender as a covariate using Conditional Process Modeling (Hayes' PROCESS Model 4), rather than through the separate regression analyses used in earlier work; the novelty of the present study is therefore primarily methodological, while building on an already well-established set of individual relationships.

Based on the background above, this study aims to examine: (1) the effect of the learning environment on SMK students' work readiness; (2) the effect of the learning environment on work motivation; (3) the effect of work motivation on work readiness; and (4) the mediating role of work motivation in the relationship between the learning environment and work readiness, with gender as a control variable.

2 Literature Review

2.1 Learning Environment

The learning environment encompasses the totality of physical, social, and psychological conditions surrounding the teaching and learning process. A conducive environment includes pedagogical support from teachers, positive social interaction among learners, a comfortable learning atmosphere, and relevance of learning materials to workforce needs. According to Bandura's (1977) social learning theory, the external environment exerts a reciprocal influence on individual behavior and cognition, such that the quality of the learning environment directly contributes to the formation of students' attitudes and competencies.

In the context of vocational education, a learning environment that is relevant to the industrial world — such as workplace practice, work simulation, and industry involvement — has been proven to improve graduates' readiness (Billett, 2011). The quality of the learning environment encompasses physical dimensions (facilities and infrastructure), social dimensions (interpersonal relationships), and academic dimensions (teaching quality and curriculum relevance).

2.2 Work Motivation

Work motivation refers to the internal drive that compels individuals to act, achieve, and maintain a work-oriented disposition. Deci and Ryan's (1985) Self-Determination Theory distinguishes between intrinsic motivation (originating within the individual) and extrinsic motivation (originating from external sources). In the context of vocational education, SMK students' work motivation reflects their enthusiasm and psychological readiness toward future employment.

Ryan and Deci (2000) affirm that an environment supportive of individual autonomy and competence will cultivate stronger intrinsic motivation. Ahmad et al. (2020) empirically demonstrated a significant

positive relationship between motivation and work readiness among SMK students, with a correlation coefficient of $r = 0.338$ at the 95% confidence level..

2.3 Work Readiness

Work readiness is defined as an individual's ability to successfully transition from an educational environment to a work environment, encompassing cognitive, affective, and psychomotor dimensions (Pool & Sewell, 2007). Caballero et al. (2011) developed the Work Readiness Scale (WRS) comprising four dimensions: organizational acumen, work competence, work identity, and social intelligence.

Wahyono (2017) demonstrated that work motivation mediates the effect of the school environment on the work readiness of SMK students across Semarang Regency. Mutoharoh and Rahmaningtyas (2019) also found positive effects of the family environment and work motivation on students' work readiness, supporting the research model of this study.

2.4 Research Model and Hypotheses

Based on the theoretical and empirical review above, this study tests the following causal mechanism: Learning Environment affects Work Readiness both directly and indirectly through Work Motivation as a mediator, while Gender is controlled as a covariate. The hypotheses proposed are as follows:

H1: Learning Environment has a significant positive effect on Work Readiness.

H2: Learning Environment has a significant positive effect on Work Motivation.

H3: Work Motivation has a significant positive effect on Work Readiness.

H4: Work Motivation significantly mediates the effect of Learning Environment on Work Readiness.

3 Research Method

3.1 Research Design and Sample

This study employed a quantitative approach with a causal-mediation design. Primary data were collected through questionnaires distributed to Grade XII students of vocational high schools (SMK) in Bandung Regency. Grade XII was selected because these students are on the verge of entering the workforce, making them most relevant for measuring work readiness. Respondents were drawn from several SMK schools, including SMK BINTARA Rancaekek and other schools accessible through the supervising teacher's network, using purposive sampling. The sample comprised 204 respondents: 143 male students (70.1%) and 61 female students (29.9%).

3.2 Research Instrument

The research instrument consisted of three 5-point Likert scales: (1) Learning Environment scale (LP) with 6 items (LP1–LP6), (2) Work Motivation scale (MK) with 5 items (MK1–MK5), and (3) Work Readiness scale (KK) with 6 items (KK1–KK6). Validity was assessed using corrected item-total correlation (minimum threshold $r = 0.30$) and reliability using Cronbach's Alpha (minimum threshold $\alpha = 0.70$).

All items and scales passed both validity and reliability tests: Learning Environment ($\alpha = 0.874$), Work Motivation ($\alpha = 0.867$), and Work Readiness ($\alpha = 0.918$). Gender was coded as a dummy variable (male = 0; female = 1).

3.3 Data Analysis Technique

Data analysis was conducted in two stages. First, descriptive statistics were used for frequency distribution and cross-tabulation. Second, Conditional Process Modeling (CPM) using PROCESS Hayes Model 4 in SPSS (Hayes, 2022) was applied to test direct effects, indirect effects (mediation),

and statistical significance through bootstrapping with 5,000 bootstrap samples at the 95% confidence level.

Because Learning Environment, Work Motivation, and Work Readiness were all measured from the same respondents, through the same questionnaire, at a single point in time, the data are potentially subject to common method variance (CMV). To check this, a Harman's single-factor test was conducted by loading all items from the three constructs into a single unrotated exploratory factor analysis; a single factor accounting for the majority of total variance would indicate a serious CMV threat. The unrotated first factor accounted for 48.96% of the total variance, below the 50% threshold conventionally used to indicate a serious CMV problem (Podsakoff et al., 2003), though the margin is modest. This result suggests that common method variance is unlikely to substantially bias the relationships reported in this study, although the single-source, cross-sectional design remains a limitation that future research using multiple data sources or time points could help address.

4 Research Results

4.1 Validity and Reliability

The validity and reliability test results for all three variables are presented in Tables 1, 2, and 3.

Table 1 : Validity and Reliability Test Results: Learning Environment ($\alpha = 0.874$)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
LP1	20.05	14.894	0.600	0.866
LP2	20.17	14.251	0.641	0.860
LP3	19.97	14.807	0.701	0.849
LP4	19.75	14.324	0.748	0.840
LP5	19.74	14.548	0.721	0.845
LP6	19.63	14.718	0.665	0.854

Table 2 : Validity and Reliability Test Results: Work Motivation ($\alpha = 0.867$)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
MK1	17.62	9.901	0.525	0.887
MK2	17.33	9.544	0.825	0.809
MK3	17.33	9.621	0.773	0.820
MK4	17.78	9.877	0.603	0.862
MK5	17.25	9.479	0.788	0.816

Table 3 : Validity and Reliability Test Results: Work Readiness ($\alpha = 0.918$)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
KK1	20.65	16.998	0.715	0.912
KK2	20.87	17.038	0.769	0.903
KK3	20.75	16.723	0.789	0.900
KK4	20.34	18.048	0.763	0.905
KK5	20.39	17.588	0.790	0.901
KK6	20.44	17.578	0.800	0.899

Based on Tables 1–3, all items across the three variables have corrected item-total correlation values above 0.30 and are therefore declared valid. Cronbach's Alpha for all variables substantially exceeds the minimum threshold of 0.70, with Work Readiness reaching a very high reliability category ($\alpha = 0.918$). All instruments are suitable for use in inferential statistical analysis.

4.2 Descriptive Statistics

Of the 204 total respondents, the majority (82.4%) fell into the high work readiness category, while only 2.9% were in the low category. The gender distribution was dominated by male students (70.1%). The cross-tabulation of gender by work readiness category is presented in Table 4.

Table 4 : Cross-Tabulation of Work Readiness Category $\times$ Gender

Work Readiness Category	Male (0)	Female (1)	Total
Low (score 6–13)	5	1	6
Moderate (score 14–21)	17	13	30
High (score 22–30)	121	47	168
Total	143	61	204

A chi-square test of independence confirmed that the distribution of work readiness categories did not differ significantly across gender groups, $\chi^2(2, N = 204) = 3.38$, $p = .184$, supporting the methodological decision to place gender as a control variable rather than a primary variable in the research model.

4.3 Results of PROCESS Hayes Model 4 Analysis

Hypothesis testing was conducted using PROCESS Hayes Model 4 with LP as the independent variable, MK as the mediator, KK as the dependent variable, and Gender as the covariate. Results are presented in Tables 5 and 6.

Table 5 : Summary of Regression Coefficients: PROCESS Hayes Model 4

Outcome	Predictor	β (coeff)	SE	p	Remarks
Work Motivation (MK) $R^2 = 0.341$; $F = 51.945$; $p < 0.001$	LP $\rightarrow$ MK	0.492	0.048	< 0.001	Significant
	GENDER $\rightarrow$ MK	-0.541	0.478	0.259	Not Significant
Work Readiness (KK) $R^2 = 0.661$; $F = 129.735$; $p < 0.001$	LP $\rightarrow$ KK	0.192	0.055	0.001	Significant
	MK $\rightarrow$ KK	0.889	0.066	< 0.001	Significant
	GENDER $\rightarrow$ KK	-1.180	0.446	0.009	Significant

Table 6 : Direct and Indirect Effects of Learning Environment on Work Readiness

Type of Effect	Effect	Boot SE	Boot LLCI (95%)	Boot ULCI (95%)	Remarks
Direct Effect: LP $\rightarrow$ KK	0.192	0.055	0.083	0.302	Significant
Indirect Effect: LP $\rightarrow$ MK $\rightarrow$ KK	0.437	0.082	0.261	0.582	Significant

4.4 Discussion

Beyond confirming the four hypotheses individually, the overall pattern carries a theoretical implication that goes beyond a simple validation exercise. Prior literature has largely treated Billett's (2011) practice-based account of readiness and Ryan and Deci's (2000) motivational account as separate explanatory frameworks, each tested on its own. The present findings suggest instead that these two mechanisms operate jointly and sequentially: environmental exposure does not merely stand alongside motivation as a rival predictor but appears to help produce it, and that motivational channel then carries

a substantial share of the environment's influence forward into readiness. Read this way, the contribution is not simply a re-confirmation of two previously documented bivariate links, but a modest integration of two normally separate theoretical accounts into a single sequential model.

H1 accepted: Learning Environment has a significant positive direct effect on Work Readiness ($\beta = 0.192$; $p = 0.001$; 95% CI [0.083; 0.302]). This finding is consistent with Billett's (2011) argument that work-relevant learning experiences — such as practice-based learning and work simulations — directly equip students with the competencies and self-confidence needed for employment. The learning environment thus functions not only as a motivational trigger but also as a direct vehicle for shaping work readiness through the internalization of professional values and expectations.

H2 accepted: Learning Environment has a significant positive effect on Work Motivation ($\beta = 0.492$; $p < 0.001$; $R^2 = 0.341$). Approximately 34.1% of the variance in work motivation is explained by the quality of the learning environment. This is consistent with Self-Determination Theory (Ryan & Deci, 2000), which asserts that environments supportive of autonomy cultivate stronger intrinsic motivation. The finding that gender does not significantly affect work motivation ($p = 0.259$) indicates that the influence of the learning environment is relatively universal across gender groups.

H3 accepted: Work Motivation has a very strong positive effect on Work Readiness ($\beta = 0.889$; $p < 0.001$). The substantially larger coefficient compared to the direct effect of the learning environment confirms that work motivation is the dominant factor in this model. This supports Ahmad et al. (2020), who demonstrated a significant relationship between motivation and work readiness among SMK students. Work motivation functions as the driving energy that transforms potential and knowledge into actual readiness to enter the workforce.

This coefficient deserves closer scrutiny rather than face-value acceptance, however. A β of 0.889 is unusually large for a single-source survey study, and part of it may reflect conceptual overlap rather than a purely causal mechanism: several Work Readiness items (e.g., professional identity, organizational acumen) plausibly share affective content with the Work Motivation items, since both were rated by the same respondents on the same instrument at the same time. The Harman's single-factor test reported in Section 3.3 suggests this overlap is not severe enough to be classified as a serious common method problem, but it is a more conservative reading than treating the coefficient purely as evidence that motivation is four times more important than environment. A more cautious interpretation is that motivation and readiness are closely intertwined constructs in this population, and that disentangling their causal ordering would benefit from a research design that separates their measurement in time or by source.

H4 accepted: Work Motivation partially mediates the effect of Learning Environment on Work Readiness (indirect effect = 0.437; 95% CI [0.261; 0.582]). As the confidence interval does not include zero, mediation is statistically significant. The mediation is partial because the direct effect of the learning environment remains significant after the mediator is included. Wahyono (2017) previously demonstrated a similar partial mediating role of work motivation, reinforcing the present findings. Thus, the learning environment influences work readiness through two mechanisms: direct competence formation and indirect improvement of motivation, which in turn drives readiness.

Gender has a significant negative effect on work readiness ($\beta = -1.180$; $p = 0.009$), suggesting that male students tend to have higher work readiness than female students after controlling for the main variables. Nevertheless, the presence of gender does not alter the direction or significance of the main relationships in the model. Possible explanations include external factors such as social norms, workplace expectations, or differential access to work experience across gender groups; however, none of these mechanisms was directly measured in the present study, so this explanation remains speculative and is offered as a direction for future research rather than a confirmed finding.

5 Conclusions

Based on the results of PROCESS Hayes Model 4 analysis on data from 204 Grade XII SMK students, all four hypotheses are supported, and beyond that confirmatory result, the pattern points to a substantive theoretical takeaway: the learning environment and work motivation do not operate as two independent explanations of readiness but as a single sequential mechanism, in which environmental exposure partly works by first building motivation. Learning Environment has a significant direct effect ($\beta = 0.192$) as well as an indirect effect through Work Motivation ($\beta = 0.437$) on Work Readiness. Work Motivation is the strongest predictor of work readiness ($\beta = 0.889$) and serves as a significant partial mediator. The model explains 66.1% of the variance in work readiness ($R^2 = 0.661$).

Practical implications: (1) Schools should improve the quality of the learning environment in ways that are relevant to the industrial world, beyond mere physical facility improvements; (2) Systematic programs to strengthen students' work motivation should be designed, given that motivation is the strongest predictor of work readiness; (3) Gender differences should be considered in designing work readiness development programs.

Future research is recommended to expand the sample across multiple schools and regions, incorporate additional mediating variables (e.g., self-efficacy), employ longitudinal designs to observe changes in work readiness over time, and consider moderators based on vocational program specialization characteristics.

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