The Dominant Influence of Internship, Motivation, and Facilities on Vocational High School Students' Welding Competency

Sigit Prastya[1], Zainur Rofiq[2]

[1]Department of Mechanical Engineering Education, Universitas Negeri Yogyakarta

[2]Faculty of Engineering, Universitas Negeri Yogyakarta, Indonesia

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ABSTRACT

This study aims to analyze: 1) the degree of contribution of industrial work practice (PKL) experience on welding competency, 2) the degree of contribution of learning motivation on welding competency, 3) the degree of contribution of workshop facilities on welding competency, and 4) the simultaneous contribution of PKL experience, learning motivation, and workshop facilities on welding competency of 12th grade students at SMKN 1 Duduksampeyan Gresik in the 2024/2025 academic year. This research employed a quantitative approach with an ex-post facto design. The subjects comprised the entire population of 12th grade students in the Welding Engineering Program at SMKN 1 Duduksampeyan, totalling 104 students, selected using the total sampling method. The subjects were selected using a total sampling method. Data were collected using questionnaires to measure PKL experience, learning motivation, and workshop facilities, as well as documentation of Skill Competency Test scores to measure welding competency. The instruments were subjected to validity and reliability testing, with all questionnaire items declared valid and reliable. Data analysis was performed using simple linear regression and multiple linear regression. The research results indicate that partially, PKL experience, learning motivation, and workshop facilities have a positive and significant effect on welding competency of 12th grade students at SMKN 1 Duduksampeyan Gresik in the 2024/2025 academic year. The magnitude of the coefficient of determination (r^2) for each variable sequentially is: PKL experience (84,8%), learning motivation (84,5%), and workshop facilities (68,6%). Furthermore, the simultaneous test results demonstrate a significant collective influence of the three variables on Welding Competency, with a simultaneous contribution (R^2) of 92,7%. The effective contribution of each variable's influence was: PKL experience 40,25%, learning motivation 40,37%, and workshop facilities 12,09%. Based on these findings, it is recommended that schools optimize the PKL programs by establishing sustainable partnerships with credible welding companies or workshops, facilitating instructional strategies that foster learning motivation, and providing adequate workshop facilities to consistently maintain the quality of student competency.

Keywords: Welding Competency, Industrial Work Practice, Learning Motivation, Workshop Facilities.

INTRODUCTION

Vocational High School (SMK) aims to produce graduates who are work-ready and possess technical competencies relevant to the demands of the business and industrial. Welding Competency, especially in Mechanical Engineering, is a vital skill in the manufacturing and construction sectors. The quality of vocational graduates is measured by their level of competence mastery, which requires optimal support from both external and internal factors (Slameto, 2010).

This research focuses on three key factors believed to influence practical competence mastery: Industrial Work Practice (PKL) Experience, Workshop Facilities, and Learning Motivation. PKL, commonly known as an internship, is central to vocational education as it bridges the theory-practice gap. High-quality PKL provides real-world exposure to current industry standards and technology. Adequate Workshop Facilities serve as the primary infrastructure for practical learning at school. Meanwhile, Learning Motivation is an internal factor determining the intensity and perseverance of students in acquiring skills (Gagne, 1985).

Previous studies (Fatimah & Paryanto, 2023; Harjanto & Surono, 2020; Yoto & Suharto, 2021) have emphasized that industrial work experience, learning motivation, and the availability of workshop facilities are dominant factors influencing vocational competence. Although these three factors are theoretically significant, there is a need for clearer empirical analysis regarding the magnitude of their respective contributions, particularly in the context of welding at SMKN 1 Duduksampeyan. Therefore, this study aims to analyze the partial and simultaneous contribution of PKL Experience, Learning Motivation, and Workshop Facilities toward the mastery of Welding Competency among 12th grade students.

METHOD

This study employed a quantitative approach with an ex-post facto design, analyzing the relationship between variables without the researcher's manipulation.

The research subjects included the total population of 12th grade students in the Welding Engineering competency at SMKN 1 Duduksampeyan, totaling 104 students, selected using the total sampling method.

The independent variables (X) were PKL Experience (X_1), Learning Motivation (X_2), and Workshop Facilities (X_3). The dependent variable (Y) was Welding Competency Mastery.

Data for the independent variables were collected using validated and reliable Likert-scale questionnaires. Data for Welding Competency were obtained through documentation of Skill Competency Test scores. Data analysis techniques included simple linear regression (for partial contributions) and multiple linear regression (for simultaneous contributions). Classical assumption tests (normality, linearity, multicollinearity, and heteroscedasticity) were conducted and met the regression analysis requirements.

RESULTS AND DISCUSSION

Partial Regression Analysis Results

The simple linear regression analysis indicated that PKL Experience, Learning Motivation, and Workshop Facilities partially have a positive and significant effect on Welding Competency (Sig. < 0,05). A summary of the partial coefficient of determination (r^2) results is presented:

Table 1. Summary of Partial Contribution Results

Independent Variable (X)	Coefficient of Determination (r^2)	Contribution Level (%)
PKL Experience (X_1)	0,848	84,8%
Learning Motivation (X_2)	0,845	84,5%
Workshop Facilities (X_3)	0,686	68,6%

Simultaneous Regression Analysis Results

The simultaneous test (F test) confirmed that PKL Experience, Learning Motivation, and Workshop Facilities collectively have a significant influence on students' Welding Competency Mastery.

The Simultaneous Coefficient of Determination (R^2) reached **92,7%**. This indicates that 92,7% of the variation in students' Welding Competency can be explained by the three variables in the model, with the remaining 7,3% explained by factors outside the model.

The calculation of Effective Contribution (SE) identified the most dominant factors:

Table 2. Effective Contribution of Independent Variables

Variable	Effective Contribution (SE)
Learning Motivation (X_2)	**40,37%**
PKL Experience (X_1)	40,25%
Workshop Facilities (X_3)	12,09%

DISCUSSION

The findings demonstrate that Learning Motivation (40,37%) and PKL Experience (40,25%) are the most dominant predictors. This is consistent with theories that emphasize the importance of internal conditions (motivation) for skill mastery, as welding requires high perseverance and focus (Gagne, 1985).

The significant contribution of PKL experience underscores the importance of the *link and match* concept. PKL provides contextual learning that cannot be fully replicated in the school workshop (Sukirno, 2018). Students with quality industry exposure acquire higher competency by understanding actual workplace standards and disciplines.

While Workshop Facilities were statistically significant, their effective contribution was the lowest (12,09%). This suggests that facilities are an essential *input* prerequisite, but their effectiveness is heavily dependent on the *process* variable (Motivation) and the *context* (PKL). High-quality facilities will not translate into competence if students lack the motivation to utilize them or the contextual experience provided by industry internships.

The overall strong model (R^2=92,7%) reinforces the recommendation that vocational school policies should focus on two main pillars: enhancing the quality of industry-based experience (PKL) and investing in instructional strategies that boost students' internal drive (Learning Motivation).

CONCLUSION AND SUGGESTIONS

Conclusion

1. PKL Experience, Learning Motivation, and Workshop Facilities individually have a positive and significant effect on Welding Competency.
2. The simultaneous contribution of the three variables to Welding Competency is highly significant, reaching a coefficient of determination (R^2) of 92,7%.
3. Learning Motivation and PKL Experience are the most dominant variables in predicting students' Welding Competency.

Suggestions

1. Schools are recommended to optimize the PKL program by establishing sustainable strategic partnerships with credible welding industries/workshops that uphold high competency standards.
2. Teachers should integrate instructional strategies that enhance students' intrinsic drive and motivation, such as Project-Based Learning that simulates industry scenarios.

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