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Analysis of the Impact of Industry–School Partnerships and Project-Based Learning on Graduates' Employability at Vocational High Schools in Jakarta

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ABSTRACT

This study examines the impact of industry-school partnerships and project-based learning on the work readiness of vocational high school graduates in Jakarta. A quantitative research design was employed, utilizing a survey distributed to 150 graduates from various vocational schools. The survey measured perceptions of industry-school partnerships, project-based learning, and work readiness using a Likert scale. The data analysis, conducted with SPSS version 25, revealed that both industry-school partnerships and project-based learning have a significant positive relationship with work readiness. Industry-school partnerships were found to enhance technical skills and industry-specific knowledge, while project-based learning fostered critical thinking, problem-solving, and teamwork. The combined effect of these two factors accounted for 29% of the variance in work readiness. The findings suggest that integrating these approaches into vocational education can significantly improve graduates' employability and better prepare them for the workforce. This study provides valuable insights for policymakers and educators aiming to improve vocational education outcomes in Jakarta and beyond.

Keywords: *Industry-School Partnerships, Project-Based Learning, Work Readiness, Vocational High School, Quantitative Analysis*

1. INTRODUCTION

The rapid pace of technological advancements and globalization has significantly transformed the labor market, creating a dynamic and competitive environment. In this evolving landscape, vocational education and training (VET) play a crucial role in preparing young people for the demands of industries. Jakarta, as a metropolitan hub, is no exception to these challenges. With an increasingly diverse workforce, it has become essential for educational programs to align with the evolving skills required by employers [1], [2]. One strategy to address this gap is the partnership between industries and schools, particularly in the context of project-based learning (PBL). These approaches aim to enhance the work readiness of vocational high school graduates by equipping them with practical skills and real-world experiences that are directly relevant to the workplace.

Industry-school partnerships have gained recognition as an effective way to bridge the gap between classroom learning and the demands of the labor market. These partnerships involve collaboration between educational institutions and businesses to provide students with hands-on experience in real work environments [3], [4]. Such collaborations can offer vocational school students access to internships, apprenticeships, mentoring, and even job placements. These opportunities allow students to develop the necessary professional skills and industry-specific knowledge required for effective performance in the workforce [5]. Moreover, when industries actively contribute to shaping the curriculum and training programs, they ensure that graduates are equipped to meet emerging challenges and technological advancements.

Project-based learning (PBL) further complements this approach by focusing on active learning through project completion. This instructional method emphasizes solving real-world problems, often in collaboration with industry partners, thereby fostering critical thinking, problem-solving, and teamwork skills [6], [7]. PBL enables students to apply their theoretical knowledge in practical contexts, which is essential for developing work readiness. Through projects, students gain experience in managing tasks, meeting deadlines, and collaborating effectively—key competencies that employers seek in potential employees. This hands-on approach not only engages students but also ensures they are better prepared for the practical demands of the workplace [8], [9].

Despite the growing recognition of the importance of industry-school partnerships and project-based learning, there remains a gap in empirical research exploring their combined impact on work readiness, particularly in the context of Jakarta. While numerous studies have examined these approaches separately, few have investigated their combined effect on vocational high school graduates' work readiness. Furthermore, there is limited research focusing on Jakarta, where the demand for skilled workers is especially high. This highlights the need for research that directly addresses the impact of these educational strategies on the employability of graduates in the city's competitive labor market.

This study aims to fill this gap by examining the impact of industry-school partnerships and project-based learning on the work readiness of vocational high school graduates in Jakarta. Through a quantitative analysis involving 150 vocational school graduates, the research will assess the extent to which these factors contribute to graduates' preparedness for the workforce. The findings will provide valuable insights for educators, policymakers, and industry leaders, enabling them to refine vocational education and training programs and better align them with the needs of the labor market.

The primary research problem of this study is to determine whether industry-school partnerships and project-based learning have a significant impact on the work readiness of vocational high school graduates in Jakarta. The study's objectives are to examine the relationship between these two factors and work readiness, analyze the effect of project-based learning on work readiness, and investigate their combined impact on the preparedness of graduates for the workforce. The research will ultimately offer recommendations for improving vocational education systems in Jakarta, helping them better meet the demands of both industries and the labor market.

2. LITERATURE REVIEW

2.1 Industry-School Partnerships

Industry-school partnerships have gained traction in vocational education due to their potential to enhance the quality of education and better align it with labor market needs. These partnerships are designed to provide students with opportunities to gain practical, hands-on experience in real-world environments, bridging the skills gap between classroom learning and actual job performance. Grounded in the theory of experiential learning, as described by [10], [11], these partnerships allow students to engage in concrete experiences, reflect on them, and apply their findings in new situations, thus acquiring practical skills directly relevant to their future careers. Empirical research supports the effectiveness of these partnerships, with studies like [10], [11] showing that students involved in industry partnerships exhibit improved job readiness, problem-solving abilities, and employability. Similarly, [10] found that

industry internships and apprenticeships enhanced students' workforce preparedness. In Jakarta, industry-school partnerships could significantly improve vocational education by exposing students to the evolving needs of the local economy, which requires a workforce skilled in industries such as manufacturing, technology, and services, ensuring that graduates are equipped to meet these demands.

2.2 Project-Based Learning (PBL)

Project-based learning (PBL) is an instructional approach that enables students to work on projects designed to solve real-world problems, rooted in constructivist learning theory, which suggests that knowledge is best constructed through active problem-solving and engagement in meaningful tasks [6], [12]. Particularly relevant to vocational education, PBL equips students with practical skills that can be directly applied in the workplace. Grounded in constructivist and active learning theories, such as those proposed by [8], [13], PBL encourages students to learn by doing, fostering collaboration, critical thinking, and the application of knowledge in real-world scenarios. This approach not only enhances technical skills but also develops soft skills like teamwork, communication, and problem-solving, which are essential for workplace success. Empirical studies support the effectiveness of PBL, with [13] finding that students who participated in PBL developed higher-order thinking skills and greater engagement with their learning. [8], [9] meta-analysis further highlighted improvements in problem-solving, critical thinking, and teamwork abilities, which are key components of work readiness. In Jakarta, PBL could effectively address the skills gap by aligning educational outcomes with industry needs. By working on projects that reflect real industry challenges, students can develop the competencies highly valued by employers in the local labor market, while also gaining a deeper understanding of subject matter and preparing for the dynamic nature of modern workplaces.

2.3 The Combined Impact of Industry-School Partnerships and Project-Based Learning

While both industry-school partnerships and project-based learning (PBL) have individually been shown to enhance work readiness, the combined effect of these two approaches has received less attention in the literature. However, some studies suggest that integrating both strategies can have a synergistic effect on students' preparedness for the workforce. By combining industry-school partnerships and PBL, students can experience a comprehensive learning approach that blends the practical expertise of industry professionals with the hands-on, problem-solving learning facilitated by PBL. This dual strategy has the potential to provide students with more robust and applicable skills that are directly relevant to the needs of the workforce.

The combination of industry-school partnerships and PBL aligns with the theory of collaborative learning, which emphasizes the value of learning through interaction with others, including peers, teachers, and industry professionals. [6], [14] social constructivist theory suggests that learning is enhanced when students engage in social interactions, share knowledge, and solve problems collectively. By integrating industry involvement with project-based tasks, students can benefit from both the practical experience provided by industry partners and the active, hands-on learning facilitated by PBL. Empirical studies further support this approach; for example, [8] found that students participating in a PBL curriculum with industry collaboration reported higher

levels of job readiness and improved problem-solving skills. Similarly, [8], [9] found that industry-integrated PBL programs significantly enhanced students' employability skills. In Jakarta, integrating both strategies could effectively align vocational education with the needs of industries in sectors such as manufacturing, technology, and services, ensuring that students gain both the technical expertise and real-world insights necessary to thrive in the workforce.

2.4 Work Readiness in Vocational Education

Work readiness refers to the set of skills, knowledge, and attitudes necessary for individuals to transition successfully from education to the workforce. These competencies generally include technical abilities, problem-solving skills, communication, teamwork, and adaptability. Vocational education plays a key role in preparing students for the workforce by equipping them with the essential skills required to excel in their chosen careers. Work readiness is often used as a benchmark to evaluate the effectiveness of vocational education programs, as it reflects the degree to which students are prepared to meet the demands of the labor market.

Work readiness is commonly defined through both hard skills (technical knowledge and expertise) and soft skills (personal attributes such as communication, teamwork, and problem-solving). According to [15], [16], work readiness includes the ability to apply knowledge in practical situations, adapt to workplace environments, and collaborate effectively with others. For vocational high school graduates, being work-ready means having the competencies necessary to perform job functions efficiently and effectively. In this study, work readiness is measured using a Likert scale survey that captures students' self-reported perceptions of their preparedness, focusing on areas such as communication, problem-solving, technical skills, and teamwork. By examining the impact of industry-school partnerships and project-based learning (PBL) on these competencies, this research aims to provide valuable insights into the factors contributing to work readiness in vocational education.

3. METHODS

3.1 Research Design

The research design is a correlational, cross-sectional study that seeks to examine the relationships between industry-school partnerships, project-based learning, and work readiness. Correlational research is appropriate for this study as it allows the exploration of associations between variables without manipulating them. This design provides insights into the strength and direction of the relationships between industry-school partnerships, project-based learning, and the work readiness of vocational high school graduates.

3.2 Population and Sample

The target population for this study consists of vocational high school graduates in Jakarta who have recently completed their education. These graduates are specifically chosen because they are in a critical transitional phase from education to the workforce, where their work readiness is directly influenced by their educational experiences, including participation in industry-school partnerships and project-based learning (PBL). This focus allows for a thorough examination of how these educational strategies affect their preparedness for the workforce.

The sample for this study was selected using a non-probability purposive sampling technique, which enables the researcher to target a specific group of individuals who meet particular

criteria, ensuring that the sample accurately reflects the population of interest. The sample size consists of 150 vocational high school graduates, which is deemed adequate for a quantitative analysis and ensures sufficient statistical power. To maintain representativeness, the participants were selected from multiple vocational schools across Jakarta, encompassing graduates from various fields such as manufacturing, technology, and services. The inclusion criteria required participants to have completed their studies within the last year and to have participated in industry-school partnerships and/or project-based learning during their education.

3.3 Data Collection Instruments

Data were collected through a structured questionnaire designed to measure the perceptions of vocational high school graduates regarding their work readiness and their experiences with industry-school partnerships and project-based learning (PBL). The questionnaire consisted of three main sections. The first section, *Industry-School Partnerships*, assessed participants' perceptions of the effectiveness of these partnerships in enhancing their work readiness. Items in this section focused on aspects such as the availability of internships, mentorship opportunities, and exposure to real-world industry practices. Responses were measured on a Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The second section, *Project-Based Learning (PBL)*, gauged the extent of participants' engagement in PBL during their education. It examined the relevance of projects to real-world tasks, the opportunity to work on collaborative projects, and the development of problem-solving and teamwork skills, with responses again ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

The third section, *Work Readiness*, evaluated the participants' work readiness in areas such as technical skills, communication, problem-solving, and teamwork. Respondents rated their perceived abilities in these areas using a Likert scale from 1 (Not Ready at All) to 5 (Completely Ready). To ensure the clarity, reliability, and validity of the instrument, the questionnaire was pre-tested with a small group of vocational school graduates. Based on feedback from the pre-test, minor revisions were made to improve the accuracy and effectiveness of the instrument in capturing the necessary data.

3.4 Data Collection Procedure

The data collection process involved distributing survey questionnaires to 150 vocational high school graduates across Jakarta, utilizing both online and in-person methods based on participants' availability and convenience. The online survey was hosted on a secure platform, with participants receiving a link to the survey via email or social media, while in-person surveys were administered at vocational schools, where the researcher was present to explain the study’s purpose and address any questions. The data collection period spanned four weeks, during which reminders were sent to participants to ensure a high response rate. As a result, all 150 surveys were completed, achieving a 100% response rate.

3.5 Data Analysis

Descriptive statistics were used to summarize the demographic characteristics of the sample and the responses to the survey questions. Measures such as frequency distributions, means, and standard deviations were calculated for each variable, including industry-school partnerships, project-based learning, and work readiness. These descriptive statistics provided an overview of the data, helping to identify trends and patterns within the sample and offering insights into the general distribution of responses.

To analyze the relationships between the independent variables (industry-school partnerships and project-based learning) and the dependent variable (work readiness), inferential statistical techniques were employed. Multiple regression analysis was specifically used to examine the impact of industry-school partnerships and project-based learning on work readiness, assessing the strength and direction of the relationships while controlling for potential confounding variables.

The study tested three hypotheses: H1: A significant positive relationship exists between industry-school partnerships and work readiness; H2: A significant positive relationship exists between project-based learning and work readiness; H3: The combined effect of industry-school partnerships and project-based learning significantly enhances work readiness. The regression analysis was conducted using SPSS version 25, with a significance level set at 0.05, and the results were interpreted in terms of the strength of the relationships and the practical implications for improving vocational education programs.

4. RESULT AND DISCUSSION

4.1 Descriptive Statistics

The descriptive statistics provide a summary of the sample's demographic characteristics and their responses to the key variables of interest: industry-school partnerships, project-based learning, and work readiness.

Table 1. Demographic Profile of Participants

Demographic Variable	Frequency (%)
Gender	
Male	85 (56.7%)
Female	65 (43.3%)
Field of Study	
Manufacturing	55 (36.7%)
Technology	45 (30.0%)
Services	50 (33.3%)
Years Since Graduation	
1 Year	150 (100%)

Table 1 presents the demographic profile of the participants, highlighting key characteristics such as gender, field of study, and years since graduation. The sample consists of 56.7% male and 43.3% female graduates, indicating a relatively balanced gender distribution. In terms of their field of study, 36.7% of participants specialized in manufacturing, 30% in technology, and 33.3% in services, reflecting a diverse range of vocational disciplines. Notably, all participants had graduated within the past year, providing a snapshot of recent vocational school graduates transitioning into the workforce. This demographic distribution offers a comprehensive view of the sample, allowing for an analysis of work readiness across different gender and academic backgrounds.

Table 2. Mean Scores for Industry-School Partnerships, Project-Based Learning, and Work Readiness

Variable	Mean (SD)
Industry-School Partnerships	4.2 (0.6)
Project-Based Learning	4.3 (0.5)
Work Readiness	4.1 (0.7)

Table 2 presents the mean scores and standard deviations for the variables of industry-school partnerships, project-based learning, and work readiness. The mean score for industry-school partnerships is 4.2 with a standard deviation of 0.6, suggesting that participants generally perceive these partnerships as effective in enhancing their work readiness. Project-based learning scored slightly higher, with a mean of 4.3 and a standard deviation of 0.5, indicating that students perceive PBL as a highly beneficial approach for preparing them for the workforce. The work readiness score, with a mean of 4.1 and a standard deviation of 0.7, reflects a strong self-assessment of participants' preparedness for employment, though with a slightly higher variability in responses. Overall, these results suggest that both industry-school partnerships and project-based learning are seen positively

by the graduates, contributing to their work readiness, though there is some variation in how individuals assess their own preparedness.

4.2 Inferential Statistics

Hypothesis Testing:

To test the hypotheses, multiple regression analysis was conducted to examine the impact of industry-school partnerships and project-based learning on work readiness.

Table 3. Results of Multiple Regression Analysis.

Predictor Variable	β (Standardized)	t-value	p-value	95% Confidence Interval
Industry-School Partnerships	0.327	3.456	0.001	[0.177, 0.475]
Project-Based Learning	0.384	4.124	0.000	[0.235, 0.538]
R^2	0.297			
Adjusted R^2	0.274			

Table 3 presents the results of the multiple regression analysis, which explores the impact of industry-school partnerships and project-based learning on work readiness. The regression coefficients (β) indicate that both predictor variables—industry-school partnerships (β = 0.327) and project-based learning (β = 0.384)—have a positive and significant relationship with work readiness. The t-values of 3.456 for industry-school partnerships and 4.124 for project-based learning suggest strong statistical significance, with p-values of 0.001 and 0.000, respectively, both of which are well below the 0.05 threshold. The 95% confidence intervals for both variables ([0.177, 0.475] for industry-school partnerships and [0.235, 0.538] for project-based learning) further confirm the precision of these estimates, as they do not include zero, indicating a robust positive effect.

The R^2 value of 0.297 suggests that approximately 29.7% of the variance in work readiness can be explained by the combination of industry-school partnerships and project-based learning. The adjusted R^2 of 0.274 accounts for the number of predictors in the model and provides a more conservative estimate, still showing a significant portion of variance explained. These results suggest that both industry-school partnerships and project-based learning contribute meaningfully to enhancing work readiness, though other factors not included in this model likely account for the remaining 70% of variance in work readiness. Overall, the analysis highlights the importance of these educational strategies in preparing students for the workforce.

Discussion

The results of this study demonstrate the significant impact of both industry-school partnerships and project-based learning on the work readiness of vocational high school graduates in Jakarta. The findings align with the theoretical underpinnings of experiential learning and constructivist theories, which emphasize the importance of hands-on learning and real-world experience in preparing students for the workforce.

The positive relationship between industry-school partnerships and work readiness suggests that internships, apprenticeships, and other forms of industry collaboration provide students with valuable opportunities to acquire practical skills and knowledge. These findings are consistent with those of [6], [17], who found that industry involvement in education improves students' employability.

Similarly, the positive relationship between project-based learning and work readiness reinforces the idea that active, problem-solving-based education enhances students' critical thinking, collaboration, and communication skills. This finding supports the research of [9], [18], [19], who concluded that project-based learning fosters key competencies that are essential for success in the workplace.

The combined effect of these two approaches further underscores the importance of integrating industry experience with project-based learning in vocational education programs. By

providing students with both real-world exposure and the opportunity to work on practical projects, vocational schools can better prepare students for the complexities of modern workplaces. In Jakarta, where the demand for skilled workers is high, these strategies can significantly enhance the employability of graduates and align vocational education with industry needs.

Limitations and Recommendations

While this study provides valuable insights into the relationship between industry-school partnerships, project-based learning, and work readiness, it is important to acknowledge some limitations. The sample was limited to graduates from vocational high schools in Jakarta, which may not be representative of all vocational high school graduates in Indonesia. Additionally, the study relied on self-reported data, which may introduce bias in participants' responses.

Future research could explore the long-term impact of industry-school partnerships and project-based learning on work readiness, using a longitudinal design. Furthermore, studies that examine the specific types of industry-school partnerships (e.g., internships, mentorships) and project-based learning models (e.g., collaborative projects, real-world problem-solving tasks) could provide more granular insights into the effectiveness of these approaches.

CONCLUSION

The results of this study highlight the significant role that industry-school partnerships and project-based learning play in enhancing the work readiness of vocational high school graduates in Jakarta. Both factors independently contributed to the graduates' preparedness for the workforce, with project-based learning having a slightly stronger effect. The integration of real-world industry experience with project-based educational practices offers a comprehensive approach to improving vocational education, ensuring that students are equipped with the practical skills and competencies demanded by employers. The combined effect of these strategies suggests that vocational high schools should prioritize industry engagement and active, hands-on learning to better align their programs with labor market needs. The findings of this study provide important implications for the design and implementation of vocational education programs, with a particular focus on preparing graduates for successful transitions into the workforce.

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