

Technical capabilities and work environment in power plant operational performance: A project management assessment

Adenantha L. Dewa^{a*}, Arief Boediman Rosidi^b and Lisda Rahmasari^b

^aFaculty of Economics and Business, Universitas Maritim AMNI, Semarang, Central Java 50246, Indonesia

^bDepartment of Commercial and Port Shipping Management, Maritime Faculty, Universitas Maritim AMNI, Semarang, Central Java 50246, Indonesia

ABSTRACT

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Recognizing the critical importance of worker technical capability and the work environment is a pressing need to enhance employee performance within a power plant. Prioritizing the improvement of worker capabilities and fostering favorable work environments is urgently required for project managers to align their workforce with project objectives and enhance overall operational results. This study aims to explore the impact of key operational and human resource management (HRM) practices on the performance of the Tanjung Jati B Steam Power Plant in Jepara, Indonesia. A sample of 110 employees was selected through a simple random sampling method, and data analyzed by multiple regression analysis with SPSS software. The results reveal significant effects of work ability, work discipline, and work environment and employee performance. Furthermore, an ANOVA test underscores that these three independent variables collectively have a positive and significant impact on employee performance. This research emphasizes the critical role of HRM practices and operational aspects in enhancing power plant performance. In the context of project management, these findings highlight the significance of developing and maintaining a workforce with the necessary skills, discipline, and conducive work environments to ensure the successful execution of operational success of a power plant. By comprehending the impact of worker technical capability on employee performance, project managers can make informed decisions and implement strategies to enhance project outcomes.

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1. Introduction

The steam power plant's role as a fundamental technology in electricity generation in Indonesia carries significant implications for project management. This versatile technology is widely applied in various thermal-based power projects. Take, for instance, the Tanjung Jati B Steam Power Plant, strategically positioned in the Jepara regency on Central Java's north coast. With geospatial coordinates around 60° 26' south latitude and 110° 44' east longitude, this complex consists of four units, each boasting substantial gross and net power capacities. The reliance on coal, primarily sourced from Kalimantan and transported via sea, underscores the strategic importance of energy resource management. In the context of project management, this highlights the need for effective resource allocation, infrastructure planning, and risk management to ensure uninterrupted power generation. Moreover, human resource management is indispensable for the efficient operation and safety of the power plants (Rollenhagen, 2006; Kettunen et al., 2007). Skilled and motivated personnel are the backbone of power generation, and their training, recruitment, and retention are critical project management tasks (Tyagi & Parimoo, 2017). Furthermore, HRM practices play a crucial role in enforcing safety protocols, regulatory compliance, and maintaining workforce well-being. In an era of evolving energy demands and increasing environmental concerns, project managers must ensure that power plants can adapt to emerging technologies and evolving practices (Wu et al., 2019). Effective project management in this context demands a comprehensive approach that integrates energy resource management and HRM to meet the challenges of the power generation sector.

* Corresponding author

E-mail address a.abdelraheem@psau.edu.sa (A. L. Dewa)

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In the context of human resource management, worker technical capability is a pivotal component related to an individual's knowledge and skills that can be acquired through formal education, training, or experiential learning (Thompson & Heron, 2005). This capacity to perform tasks within a job is defined by Greenhow and Lewin (2019) as an individual's ability. Such abilities are typically classified into two primary categories: intellectual and physical. Intellectual abilities encompass a range of mental activities, including thinking, reasoning, and problem-solving (Schmeichel et al., 2018). Intellectual abilities are particularly salient in complex roles with heightened information processing demands, while physical abilities prove indispensable in jobs characterized by fewer skill requirements and more standardized tasks. In a general context, the manifestation of good work discipline is observed when employees consistently and punctually report to their workplace, adhere to appropriate dress codes, exercise care in the use of materials and equipment, deliver work of both satisfactory quality and quantity, and faithfully follow the established work methods, all while maintaining a positive attitude. Discipline, in this context, serves as a condition that motivates employees to conduct themselves in accordance with established norms and regulations (Elqadri & Wardoyo, 2015). It implies a state where employees willingly adhere to the company's rules and guidelines, driven by their own awareness and conscience, free from any external coercion. The work environment represents the physical and psychological space in which employees engage in their daily activities. An optimal work environment is one that enables employees to perform their duties effectively while ensuring their health, safety, and overall comfort (Dheviests & Riyanto, 2020). This encompasses the conditions within and surrounding the workplace, encompassing both tangible and intangible aspects, creating an environment that is pleasant, reassuring, and fosters a sense of belonging for employees (Raziq & Maulabakhsh, 2015). The quality of the work environment holds a pivotal role in shaping employee performance. A comfortable work environment, coupled with effective communication among colleagues, is a key factor in achieving peak performance. In synthesis, it becomes evident that employee performance is subject to various factors, including the alignment of human resources with their areas of expertise. Thus, enhancing employee performance necessitates comprehensive training programs tailored to develop their skills in alignment with their roles within the organization. Furthermore, the creation of a conducive work environment is imperative in ensuring employee comfort, which, in turn, has a positive impact on their performance.

Additionally, a robust work ethic, encompassing attributes like punctuality and strict adherence to established protocols, plays a pivotal role in fostering an orderly and streamlined work environment. Consequently, this contributes to an overall enhancement in employee performance within the organization. Furthermore, the creation of a supportive work atmosphere, characterized by effective communication and a positive ambiance, acts as a catalyst for motivating employees, resulting in a notable upsurge in their productivity levels, as observed in prior research (Raziq & Maulabakhsh, 2015). Hence, it is of paramount importance to gain an in-depth understanding of the beneficial influence wielded by work ability, work discipline, and a favorable work environment. This study focuses on the essential factors of work ability, work discipline, and the work environment and their impact on employee performance within Tanjung Jati Power Plant. The rationale behind the study is rooted in recognizing the critical role of these factors in power plant management. Worker capability pertains to the skills and suitability of employees for their roles, while work discipline involves punctuality and adherence to procedures. Additionally, a positive work environment, characterized by effective communication and a supportive atmosphere, can motivate employees and enhance productivity. The aims of this research are to assess the influence of work ability, examine the role of work discipline, and analyze the impact of the work environment. These findings hold substantial implications for project management within the power plant context. They provide valuable insights for strategic decision-making, enabling the development of strategies to enhance employee performance, improve efficiency, and ensure the power plant operates at its maximum potential, thereby contributing to the achievement of project management goals.

2. Literature Review and Hypothesis Development

In a project management context, employees hold a pivotal role as a crucial component of an organization's human resources (Koch & Schermuly, 2020). A project's success and effectiveness are notably impacted by the performance of its workforce, emphasizing the importance of having quality human resources and comprehensive employee information for various management purposes (Tang et al., 2020; Chuzaimah, 2014). Employee performance is intrinsically individual, with each worker having distinct competence levels, and it is evaluated by management based on these unique abilities, making up the various components of overall performance, which, in turn, gauges an organization's success in goal achievement (Potu, 2013). This performance is evaluated against established standards, targets, goals, or mutually agreed-upon criteria, emphasizing the significance of assessing and managing individual performance within an organization (Diamantidis & Chatzoglou, 2018). The achievement motive that is grown from within oneself will form a personal strength and if the work environment is supportive then achieving performance will be easier. Factors that influence performance are individual factors, psychological factors, and organizational factors (Risqon & Purwadi, 2012). Human resources encompass the cognitive and physical capabilities that individuals acquire through learning and training, influencing their behavior and work performance, with the development of these abilities aimed at fulfilling job and position requirements. Helfat and Peteraf (2015) defines ability as an individual's capacity to carry out various tasks in a job. In the context of project management, performance within an organization is the ultimate determinant of whether predetermined goals are met or not. It represents the tangible output, encompassing both qualitative and quantitative dimensions, generated by employees as they fulfill their duties in alignment with their assigned responsibilities (Potu, 2013).

Worker capability represents the inherent potential developed through education and training that empowers employees to execute job tasks rationally and in adherence to established scientific standards, thus predicting workplace behavior and performance, as corroborated by the impact of ability-job match on service providers' performance (Chuzaimah, 2014). Ability, a facet of individual competency encompassing knowledge and skills, can be nurtured through various educational and experiential channels, contributing to an individual's capacity to perform job-specific tasks, with intellectual and physical abilities representing distinct categories of capability. While intellectual abilities are vital for roles involving complex cognitive functions, physical abilities play a significant role in less complex, standardized positions. Understanding and harnessing these abilities is pivotal in optimizing job performance and ensuring a suitable fit between employees and their roles, a critical consideration in project management and organizational success (Yazici, 2020). Empirical research consistently demonstrates a significant and positive correlation between the capabilities of workers, such as their skills, knowledge, and experience, and project performance, with projects led by highly capable and skilled workers consistently achieving better outcomes in terms of quality, efficiency, and overall success (Ling et al., 2009; Hashiguchi et al., 2021).

Work discipline is the deliberate process of shaping employees' behavior to align with an organization's goals by creating a conducive learning environment during training that enhances their knowledge, skills, and job-specific abilities (Supihati, 2014). The term discipline in this context refers to the orchestrated endeavors that facilitate the acquisition of the necessary skills, knowledge, and attitudes that align with the company's specific needs (Osagie et al., 2016). Discipline programs involve imparting employees, both new and existing, with specific knowledge and skills tailored to their job roles, ultimately enhancing their job performance (Kusuma & Said, 2017). Empirical studies have consistently demonstrated a positive correlation between work discipline, characterized by structured training and employee skill development, and improved project performance, with organizations that prioritize and invest in work discipline typically achieving higher project success rates and greater overall efficiency in their operations (Cooke-Davies et al., 2009; Jugdev et al., 2018). The work environment comprises material and psychological conditions, encompassing both physical and mental aspects, and significantly influences employees (Supihati, 2014). The work environment encompasses the physical space where employees work and significantly affects their performance, with elements like work facilities, lighting, air quality, and tools playing a crucial role, and a less supportive environment can have detrimental effects on performance (Yiu, 2008). Moreover, it is essential to recognize the importance of work facilities and infrastructure within the organizational work environment. These elements serve as crucial support factors for efficient work operations. They are vital for facilitating the flow of work activities and management, necessitating the presence of well-maintained, adequate, efficient, effective, and practical equipment that aligns with the employees' needs (Kusuma & Said, 2017). In the context of project management, an optimized work environment that addresses these physical and psychological aspects is essential for ensuring that teams can operate efficiently, maintain safety, and adhere to project schedules and requirements. Properly configured workspaces and adequate resources can enhance overall productivity and contribute to successful project outcomes (Kerzner, 2017). Empirical studies consistently reveal a strong connection between the quality of the work environment and project performance (Pheng & Chuan, 2006), with organizations that invest in providing employees with conducive workspaces, proper lighting, good air quality, and adequate resources experiencing higher project success rates (Eriksson & Westerberg, 2011).

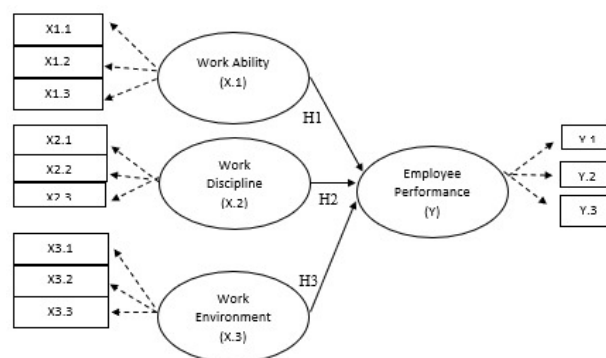


Fig. 1. Research Framework

In the realm of research, it is essential to build upon prior studies to strengthen the ongoing investigation and make meaningful comparisons. Previous research outcomes play a pivotal role in shaping the foundation for the current study. The formulation of hypotheses serves as a provisional response to the research problem posed in the form of a question. These hypotheses are considered temporary as they are grounded in theoretical constructs and knowledge. They are structured within a framework that provides a theoretical basis for understanding the relationships among variables (Fig. 1). Building upon the theoretical underpinnings concerning the attributes of work ability, educational and training experiences, and the impact of the work environment on employee performance, this research seeks to establish a rationale framework. This framework supports the development of the following hypotheses:

H₁: Worker technical capability exerts a positive and statistically significant impact on employee performance.

H₂: Work discipline positively and significantly influences employee performance.

H₃: The work environment has a positive and statistically significant effect on employee performance.

These hypotheses are designed to explore and test the relationships between these variables, drawing upon existing knowledge and theory to form the basis for the current research endeavor.

3. Research Methods

This research employs a quantitative approach, involving collecting numerical data to statistically analyze and draw conclusions. It is an appropriate method for assessing relationships and causal links between variables. In this study, both dependent and independent variables are employed. The dependent variable is "employee performance," which is the outcome or result we aim to understand and explain. The independent variables are work ability, work discipline, and the work environment. These variables are factors that can potentially influence or predict variations in employee performance. The research follows an analytical, specifically survey research, approach. Survey research involves the collection of data through structured questionnaires or interviews, aiming to gather information on attitudes, beliefs, and behaviors. This approach allows for systematic data collection, analysis, and interpretation, ultimately leading to conclusions based on the findings. To determine the sample size, 150 employees at Tanjung Jati Power Plant were considered. The margin of error was set at 5%, resulting in a sample size of 110 employees. The determination of the sample size from the population is based on the Slovin formula, which is a standard method for calculating sample sizes in research. Considering the available data on employee specifications, which indicates 150 employees, the research opted for a sample size of 110 employees (rounded up for convenience). Probability sampling, specifically the Simple Random Sampling technique, was employed in this study. Simple Random Sampling ensures that each employee in the population has an equal chance of being selected for the sample. This approach minimizes bias and enhances the generalizability of the findings to the broader population of employees at the power plant. The data collected through the survey research approach will be analyzed using the Statistical Package for the Social Sciences (SPSS). SPSS is a robust software for statistical analysis and data management, allowing for a comprehensive examination of relationships between variables. The analysis will involve employing techniques such as multiple regression analysis. These statistical methods will help determine the relationships between the independent variables (work ability, work discipline, and work environment) and the dependent variable (employee performance). Specifically, the research aims to ascertain whether these independent variables have a positive and statistically significant impact on employee performance, as stated in the hypotheses (H1, H2, H3). The data analysis process will enable the research to draw evidence-based conclusions and make informed recommendations for improving employee performance at the power plant.

4. Results

The statistical output from this study reveals compelling evidence of the direct and significant influence of various key factors on employee performance within Tanjung Jati Power Plant. The calculated correlations are robust, with, for example, worker capability (X1) exhibiting a high correlation coefficient of 0.832, indicating its strong positive relationship with employee performance (Y). Similarly, work discipline (X2) showcases substantial correlations, with X2.1, X2.2, and X2.3 having coefficients of 0.787, 0.811, and 0.801, respectively, underscoring the significance of adhering to work procedures and standards for improving employee performance. Furthermore, the working environment (X3) plays a pivotal role, with X3.2 having a high correlation coefficient of 0.822, suggesting that aspects like workplace cleanliness, lighting, and effective communication have a strong positive association with employee performance (Y). These findings are pivotal for the management of the power plant as they provide a data-driven understanding of the key determinants of employee performance. By recognizing the substantial impact of work ability, work discipline, and the working environment on employee performance, the management can make informed decisions and institute targeted initiatives to create a conducive work environment, enhance employee skills, and improve work practices. The results offer a compelling rationale for investing in the development of employees, improving the working conditions, and reinforcing discipline, ultimately leading to increased performance and productivity within the power plant.

Table 1
Validity Test Results

Variable and Item	r-stat.	r-table	Confirmation
Worker capability (X1)			
X1.1	0.832	0.2446	Valid
X1.2	0.715	0.2446	Valid
X1.3	0.789	0.2446	Valid
Work discipline (X2)			
X2.1	0.787	0.2446	Valid
X2.2	0.811	0.2446	Valid
X2.3	0.801	0.2446	Valid
Working environment (X3)			
X3.1	0.708	0.2446	Valid
X3.2	0.822	0.2446	Valid
X3.3	0.790	0.2446	Valid
Employee performance (Y)			
Y.1	0.841	0.2446	Valid
Y.2	0.811	0.2446	Valid
Y.3	0.758	0.2446	Valid

As depicted in Table 1, it becomes evident that all the research indicators employed to gauge the variables exhibit correlation coefficients surpassing the critical value denoted as "r table" (where r table for a sample size of $n = 110$ is 0.1857). Reliability testing serves as a crucial procedure for assessing the degree to which a measurement instrument remains consistent and dependable when utilized in a similar research context. By employing the alpha (α) formula, a reliability coefficient is computed for each variable under investigation in the research. This coefficient provides a quantifiable measure of the measurement tool's consistency and trustworthiness for subsequent use in the same research context.

Table 2
Reliability Test Results

Variable	Alpha Coefficient	Conclusion
Worker capability (X1)	0.773	Reliable
Work discipline (X2)	0.716	Reliable
Working environment (X3)	0.768	Reliable
Employee performance (Y)	0.725	Reliable

The reliability test results, as presented in Table 2, provide strong evidence of the consistency and dependability of the measurement tools used to assess the research variables. Notably, the Alpha coefficients for each variable surpass the commonly accepted threshold of 0.70, with worker capability (X1) achieving an impressive coefficient of 0.773, work discipline (X2) demonstrating reliability with a coefficient of 0.716, the working environment (X3) scoring 0.768, and employee performance (Y) displaying a coefficient of 0.725. These coefficients indicate that the questions or indicators used to measure these constructs yield consistent and reliable results. Researchers can place a high degree of confidence in the data gathered through these measurement tools, enhancing the validity and credibility of the study's findings.

Table 3
Regression Test Results

Model	Unstandardized Coefficients	Std. Error	Beta	t	Sig.
(Constant)	-.173	.978		-.177	.860
Work Ability	.329	.078	.346	4.187	.000
Work Discipline	.408	.087	.368	4.677	.000
Work Environment	.241	.070	.236	3.427	.001

The results presented in Table 3 provide valuable insights into the hypothesis testing for the research model. This regression analysis aims to determine the relationships between the independent variables (work ability, work discipline, and work environment) and the dependent variable (employee performance). The unstandardized coefficients provide information about the strength and direction of these relationships. The results of the regression test support the research hypotheses. Work ability, work discipline, and the work environment all have statistically significant and positive relationships with employee performance. This means that as these independent variables improve, employee performance is expected to increase. These findings have important implications for the management of Tanjung Jati Power Plant, indicating that efforts to enhance work ability, work discipline, and the working environment can lead to improved employee performance and overall operational efficiency. The first hypothesis examined the effect of worker capability on employee performance. The unstandardized coefficient for worker capability is 0.329, and it is highly significant with a p-value of 0.000. This suggests that for every unit increase in work ability, employee performance is expected to increase by 0.329 units. The positive coefficient indicates a strong positive relationship between Worker capability and employee performance. The second hypothesis investigated the impact of work discipline on employee performance. Work discipline is also significantly associated with employee performance, as indicated by a substantial unstandardized coefficient of 0.408 with a p-value of 0.000. This implies that for every unit increase in work discipline, employee performance is expected to rise by 0.408 units. Once again, the positive coefficient underscores a positive relationship. Lastly, the third hypothesis explored the influence of work environment on employee performance. The unstandardized coefficient for the work environment is 0.241, and it is statistically significant with a p-value of 0.001. This result suggests that an improvement in the working environment is linked to a 0.241-unit increase in employee performance. Once more, the positive coefficient highlights a positive relationship between the working environment and employee performance.

The results presented in Table 4 depict the outcomes of an Analysis of Variance (ANOVA) test, which is a statistical method used to assess the overall significance of the regression model. In this context, the model under scrutiny aims to understand the influence of work ability, work discipline, and the work environment (independent variables) on employee performance (the dependent variable). The statistical test yielded an F value of 53.083. The table F value for degrees of freedom (df) $1 = k = 3$ and $df 2 = n - k = 110 - 3 = 107$ is 2.126. Using a significance level of 5%, the obtained F value (53.083) surpasses the table F value (2.126). More specifically, the ANOVA results reveal that the regression model as a whole is highly significant, with a calculated F-statistic of 53.083 and a corresponding p-value of 0.000. This finding indicates that the model, which includes the predictors (constant, work environment, work discipline, and work ability), effectively explains a significant portion of the variance in employee performance. In other words, the combination of these variables has a substantial impact on employee performance. To break down the components further, the sum of squares attributed to the regression is 172,041, while the residual sum of squares is 114,514. The degrees of freedom (Df) for the regression model and the residual are 3 and 106, respectively. The mean square for the regression, calculated as the sum of squares divided by its corresponding Df, is

57,347. This value is compared to the mean square for the residuals (1,080) to compute the F-statistic. The significant F-statistic, along with a very low p-value (0.000), underscores the robust relationship between the independent variables and employee performance. In summary, the ANOVA results affirm the collective significance of work ability, work discipline, and the work environment in explaining variations in employee performance, further supporting the study's hypotheses and research findings.

Table 4
ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	172.041	3	57.347	53.083	0.000 ^a
Residual	114.514	106	1.080		
Total	286.555	109			

a. Predictors: (Constant), Work Environment, Work Discipline, Work Ability

b. Dependent Variable: Employee Performance

The concept of the coefficient of determination, denoted as R^2 , serves as a valuable tool for assessing the extent to which the dependent variable is impacted. In our analysis, we obtained an R^2 value of 0.600, indicating that 60% of employee performance is attributable to the interplay of work ability, work discipline, and the work environment. The remaining 40% represents the influence of other unexamined factors. The results presented in Table 4 reaffirm that these independent variables, particularly work ability, work discipline, and work environment in the context of Tanjung Jati Power Plant, significantly impact employee performance. This aligns with previous research findings by Pawirosumarto et al. (2017), underscoring the critical role of these variables in driving employee performance within the project management domain. A closer examination of the variables reveals that worker technical capability stands out as a pivotal and positively influential factor in shaping employee performance. This finding is consistent with the observations of Diamantidis & Chatzoglou (2018), who emphasize that worker capability not only enhances efficiency but also boosts job satisfaction and encourages a proactive work approach, ultimately contributing to heightened productivity and job performance. Worker capability encompasses essential elements such as task knowledge, work skills, and practical experience, all of which play a pivotal role in bolstering employee performance at the power plant. Among the trio of variables affecting employee performance, work discipline assumes the second position. This variable encompasses aspects like attendance, punctuality, and workplace errors, all of which can have a discernible impact on employee performance, validating prior research by Badrianto & Ekhsan (2020). Lastly, the work environment takes the third spot in influencing employee performance. Factors like infrastructure quality, cleanliness, and safety have a substantial bearing on how employees carry out their job responsibilities. From a managerial perspective, it is imperative to prioritize workplace safety, health, and cleanliness. The management, in collaboration with the Public Works Department, should ensure the provision of necessary infrastructure and personal protective equipment while guiding employees on their correct and effective usage, in accordance with the insights offered by Pawirosumarto et al. (2017). These findings have direct implications for project management, emphasizing the significance of optimizing work ability, instilling strong work discipline, and fostering a conducive work environment to enhance overall employee performance within project teams. Furthermore, sustaining a well-maintained workplace holds paramount importance for the well-being of employees and their overall work efficiency. Furthermore, giving precedence to safety measures in the workplace not only promotes a feeling of security but also has the potential to enhance employee performance as they carry out their assigned tasks. In the realm of project management within a power plant, these principles of maintaining a clean and safe work environment carry significant implications. Ensuring a clean and organized workplace not only contributes to employee health but also facilitates smooth project operations. It minimizes the risk of accidents, reduces downtime due to clutter or disorganization, and allows for more efficient resource management. Likewise, prioritizing safety aligns closely with project management best practices. Safety measures in a power plant are instrumental in preventing accidents or incidents that could disrupt project timelines and budgets. An injury or safety violation can lead to delays, increased costs, and a decrease in overall project performance. Hence, these principles are not only conducive to employee well-being but also have a direct impact on project management outcomes within the power plant environment.

5. Conclusion

The results of the regression analysis confirm the hypotheses of the study. Work ability, work discipline, and the work environment all exhibit statistically significant and positive relationships with employee performance. The study's theoretical implications underscore the critical roles played by work ability, work discipline, and the work environment as key determinants of employee performance. These findings reinforce existing literature, strengthening the theoretical foundations of human resource management and performance enhancement. The study substantiates the notion that an employee's competencies, work ethics, and the quality of their work environment are pivotal in shaping their performance outcomes. From a practical perspective, the findings have direct ramifications for project management within the power plant. Project managers and organizational leaders should prioritize the enhancement of work ability, promote a culture of robust work discipline, and ensure a conducive work environment. This can be achieved through comprehensive training programs, rigorous safety initiatives, and strategic investments in infrastructure. Such measures not only enhance employee well-being but also yield tangible benefits, including improved project performance, reduced downtime, and optimized resource allocation.

However, the study is not without limitations. Firstly, its scope was confined to a specific power plant, which may limit the generalizability of the findings to other industries. Secondly, the use of self-reported data via questionnaires introduces the potential for response bias. Additionally, while the study identified key factors influencing performance, it did not delve into the intricacies of individual differences among employees. Future research in this domain should explore the nuanced dynamics of employee performance, accounting for individual variations and unexplored factors. Comparative studies across various industries and regions could provide a broader perspective. Evaluating the long-term impact of interventions aimed at improving work ability, work discipline, and the work environment would be a valuable area for further investigation. Furthermore, deeper exploration of the relationship between these factors and specific project outcomes within power plant management is warranted.

References

- Badrianto, Y., & Ekhsan, M. (2020). Effect of work environment and job satisfaction on employee performance in pt. Nesinak industries. *Journal of Business, Management, & Accounting*, 2(1).
- Chuzaimah, C. (2014). Analisis Faktor-Faktor yang Mempengaruhi Kinerja Karyawan pada Perusahaan Furniture. *Jurnal Ilmu Administrasi Bisnis*, 4. (2).
- Cooke-Davies, T. J., Crawford, L. H., & Lechler, T. G. (2009). Project management systems: Moving project management from an operational to a strategic discipline. *Project Management Journal*, 40(1), 110-123.
- Dheviests, T. A., & Riyanto, S. (2020). The influence of work discipline, self-efficacy, and work environment on employee performance in the building plant d department at PT Gajah Tunggal Tbk. *International Journal of Innovative Science and Research Technology*, 5(1), 1062-1069.
- Diamantidis, A. D., & Chatzoglou, P. (2018). Factors affecting employee performance: an empirical approach. *International Journal of Productivity and Performance*
- Elqadri, Z. M., & Wardoyo, D. T. W. (2015). The Influence of Motivation and Discipline Work against Employee Work Productivity Tona'an Markets. *Rev. Eur. Stud.*, 7, 59.
- Eriksson, P. E., & Westerberg, M. (2011). Effects of cooperative procurement procedures on construction project performance: A conceptual framework. *International journal of project management*, 29(2), 197-208.
- Greenhow, C., & Lewin, C. (2019). Social media and education: Reconceptualizing the boundaries of formal and informal learning. In *social media and education* (pp. 6-30). Routledge.
- Hashiguchi, N., Sengoku, S., Kubota, Y., Kitahara, S., Lim, Y., & Kodama, K. (2021). Age-Dependent influence of intrinsic and extrinsic motivations on construction worker performance. *International journal of environmental research and public health*, 18(1), 111.
- Helfat, C. E., & Peteraf, M. A. (2015). Managerial cognitive capabilities and the microfoundations of dynamic capabilities. *Strategic management journal*, 36(6), 831-850.
- Ishardanti, R. (2023). Social impact analysis on environmental conflict dynamics at coal fired steam power plant. *Interaction, Community Engagement, and Social Environment*, 1(1).
- Jugdev, K., Mathur, G., & Cook, C. (2018). Linking workplace burnout theories to the project management discipline. *International Journal of Managing Projects in Business*, 11(1), 198-221.
- Kerzner, H. (2017). *Project management: a systems approach to planning, scheduling, and controlling*. John Wiley & Sons.
- Kettunen, J., Reiman, T., & Wahlström, B. (2007). Safety management challenges and tensions in the European nuclear power industry. *Scandinavian Journal of Management*, 23(4), 424-444.
- Koch, J., & Schermuly, C. C. (2020). Who is attracted and why? How agile project management influences employee's attraction and commitment. *International Journal of Managing Projects in Business*, 14(3), 699-720.
- Kusuma, M., & Said, T. (2017). Analisis Faktor-faktor yang Mempengaruhi Kinerja Karyawan PT. Bio Nusantara Teknologi Jl. Lintas Utara Km. 19 Bengkulu Tengah. *EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi dan Bisnis*, 5(2).
- Ling, F. Y. Y., Low, S. P., Wang, S. Q., & Lim, H. H. (2009). Key project management practices affecting Singaporean firms' project performance in China. *International Journal of project management*, 27(1), 59-71.
- Osagie, E. R., Wesselink, R., Blok, V., Lans, T., & Mulder, M. (2016). Individual competencies for corporate social responsibility: A literature and practice perspective. *Journal of business ethics*, 135, 233-252.
- Pawirosumarto, S., Sarjana, P. K., & Gunawan, R. (2017). The effect of work environment, leadership style, and organizational culture towards job satisfaction and its implication towards employee performance in Parador Hotels and Resorts, Indonesia. *International journal of law and management*, 59(6), 1337-1358.
- Pheng, L. S., & Chuan, Q. T. (2006). Environmental factors and work performance of project managers in the construction industry. *International journal of project management*, 24(1), 24-37.
- Potu, A. (2013). Kepemimpinan, motivasi, dan lingkungan kerja pengaruhnya terhadap kinerja karyawan pada Kanwil Ditjen Kekayaan Negara Suluttenggo dan Maluku Utara di Manado. *Jurnal Emba: Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi*, 1(4).
- Raziq, A., & Maulabakhsh, R. (2015). Impact of working environment on job satisfaction. *Procedia Economics and Finance*, 23, 717-725.
- Risqon, M., & Purwadi, D. (2012). Pengaruh Kepemimpinan, Kompensasi dan Kemampuan Kerja Terhadap Kinerja Karyawan. *Jurnal Manajemen dan Kewirausahaan*. 13(1).

- Rollenhagen, C. (2006). Safety management of nuclear power plants—Values and balance of attention. *Nordic perspectives on safety management in high reliability organisations. Theory and applications*, 75-94.
- Schmeichel, B. J., Vohs, K. D., & Baumeister, R. F. (2018). Intellectual performance and ego depletion: Role of the self in logical reasoning and other information processing. In *Self-Regulation and Self-Control* (pp. 310-339). Routledge.
- Supihati, S. (2014). Analisis faktor-faktor yang mempengaruhi kinerja Karyawan perusahaan Sari Jati di Sragen. *Jurnal Paradigma Universitas Islam Batik Surakarta*, 12(01), 115677.
- Tang, H., Wang, G., Zheng, J., Luo, L., & Wu, G. (2020). How does the emotional intelligence of project managers affect employees' innovative behaviors and job performance? The moderating role of social network structure hole. *SAGE Open*, 10(4), 2158244020969382.
- Thompson, M., & Heron, P. (2005). Management capability and high-performance work organization. *The International Journal of Human Resource Management*, 16(6), 1029-1048.
- Tyagi, R. K., & Parimoo, D. D. (2017). Capability Building in Indian Solar Power Industry for Talent Management and Retention. *International Journal of Marketing and Human Resource Management*, 8 (2), 21-37.
- Wu, G., Hu, Z., & Zheng, J. (2019). Role stress, job burnout, and job performance in construction project managers: the moderating role of career calling. *International journal of environmental research and public health*, 16(13), 2394.
- Yazici, H. J. (2020). An exploratory analysis of the project management and corporate sustainability capabilities for organizational success. *International journal of managing projects in business*, 13(4), 793-817.
- Yiu, C. Y. (2008). A conceptual link among facilities management, strategic management and project management. *Facilities*, 26(13/14), 501-511.



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