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Optimizing Employee Performance through Strengthening Training Competencies and Implementing Effective Leadership: A Study at PT PLN Nusantara Power UP Punagaya Jeneponto

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A R T I C L E I N F O

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A B S T R A C T

This study investigates how training and leadership relate to employee performance at PT PLN Nusantara Power UP Punagaya Jeneponto. A quantitative design was applied to a population of 126 employees, from which 96 respondents were selected using the Slovin formula. Questionnaire data were supported by observation, interviews, documentation, and literature review and were analyzed with validity and reliability tests, multiple linear regression, t-tests, an F-test, and R^2 in SPSS 24. Training significantly predicted performance ($t = 2.911$; $p = 0.005$), as did leadership ($t = 2.741$; $p = 0.007$). Jointly, both variables were significant ($F = 17.773$; $p < 0.001$). The model explained 27.7% of performance variation, indicating that other organizational factors remain important.

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INTRODUCTION

PLN Nusantara Power (PLN NP) operates as a power-generation subholding whose activities include the management of large generating units as well as supporting services such as operations and maintenance, procurement and construction, training, and consulting. The reliability of these activities depends heavily on the way employees are developed and managed. Consequently, human resource practices are expected to support operational efficiency and the achievement of organizational targets.

Competitive pressure and rapid changes in work processes make employee capability development increasingly important. Training is one mechanism through which organizations can close competency gaps, strengthen job-related knowledge and skills, and help employees adapt to new technologies and work methods. Its contribution will be greater when the program is designed around actual competency needs, delivered systematically, and followed by opportunities to apply the acquired skills in the workplace (Ananto, Nururrohmah, and Natalia, 2023; Syach et al., 2023; Agustin et al., 2024; Pasaribu, Sinaga, and Hutagalung, 2023).

Employee development also depends on the quality of leadership. Leaders do more than provide formal direction; they shape communication, allocate support, create development opportunities, and influence how employees respond to organizational demands. Leadership that is able to align employee needs with organizational priorities can foster involvement and strengthen work performance, whereas ineffective leadership may weaken employee engagement and organizational outcomes (Nurnaningsi and Putra, 2022; Shelamita, Nur, and Ilahi, 2023; Asike, 2021).

The study was conducted at PT PLN Nusantara Power UP Punagaya in Jeneponto, South Sulawesi. The unit operates a 2 × 100 MW steam power plant and contributes to electricity supply in the South Sulawesi, Southeast Sulawesi, and West Sulawesi system. Its operations rely on complex technical processes and a workforce distributed across managerial, engineering, maintenance, operational, business-support, and occupational safety functions. The unit has also adopted co-firing initiatives using corn-cob waste in cooperation with local farmers, illustrating that its activities are linked not only to electricity production but also to local economic and sustainability initiatives.

Table 1. Employee Data of PT PLN Nusantara Power UP Punagaya Jeneponto

No.	Workforce Formation (FTK)	Number of Employees
1	Manager	1
2	Business Support Division	8
3	Engineering Division	25
4	Maintenance Division	19
5	Operations Division	67
6	Occupational Health, Safety, Environment, and Security Division	6
Total		**126**

Source: PT PLN Nusantara Power UP Punagaya Jeneponto

Field observations indicated that access to training was not evenly experienced by all employees. When development opportunities are concentrated among particular groups, differences in capability may persist and employees who are not selected may perceive fewer opportunities for professional growth. Such perceptions can reduce enthusiasm and may ultimately influence the quality of work performance.

A second concern involved the intensity of direct interaction between leaders and employees. Limited face-to-face communication may restrict opportunities for employees to receive immediate guidance, feedback, and support. Over time, weak interaction can affect trust, work motivation, and employees' sense of responsibility for assigned tasks, which may prevent performance from reaching its expected level.

LITERATURE REVIEW

Human Resource Management

Human resource management concerns the coordinated management of people so that their capabilities can be used effectively for both organizational and individual purposes. It covers activities such as workforce planning, staffing, development, compensation, integration, maintenance, and supervision. From this perspective, employees are not merely labor inputs; their competencies, effort, and potential constitute strategic resources that influence organizational performance (Pratama et al., 2023; Syach et al., 2023; Nurnaningsi and Putra, 2022).

Training

Training can be understood as a planned organizational effort to build the job-related capabilities employees need to perform current or future assignments. Rather than being limited to the transfer of basic skills, training may strengthen knowledge, technical ability, and work attitudes that support a required level of competence (Syach et al., 2023; Agustin et al., 2024).

In practical terms, training is directed at specific performance needs. It helps employees improve the execution of present duties, become prepared for unfamiliar assignments, and respond more effectively to changes in technology, procedures, or organizational expectations (Pasaribu, Sinaga, and Hutagalung, 2023).

The training construct in this study follows the indicators summarized by Syach et al. (2023), namely instructor quality, participant suitability, training material, delivery method, program objectives, and training targets. Instructor competence concerns the trainer's expertise and ability to communicate material effectively. Participant suitability refers to the selection and motivation of employees who attend the program. Training content should correspond to organizational needs and remain relevant to current conditions. The method should fit both the subject matter and participant characteristics. Objectives need to state the capabilities expected after training, while targets should be formulated in sufficiently specific and measurable terms.

Leadership

Leadership refers to the process through which a leader influences individual or group behavior so that work is directed toward agreed organizational goals. This influence may be exercised through communication, direction, example, decision making, and the organization of collective effort (Asike, 2021; Sulu, Mangantar, and Taroreh, 2022).

Because leadership shapes how members coordinate their activities and interpret organizational priorities, it has an important role in goal attainment. Leadership behavior that gives clear direction and mobilizes employees toward shared objectives can support both individual contribution and organizational performance (Nurnaningsi and Putra, 2022).

Leadership was measured using indicators adapted from Sutikno as cited by Shelamita, Nur, and Ilahi (2023). These indicators cover the concentration of decision authority, clarity of work instructions, subjectivity in evaluating employees, the extent to which participation is genuinely accommodated, and supervisory control. Together, the indicators describe how leaders direct work, involve subordinates, and monitor task implementation.

Employee Performance

Employee performance reflects the extent to which employees carry out assigned responsibilities and produce outcomes expected by the organization. It includes both observable work results and the manner in which employees fulfill the roles attached to their positions (Asike, 2021; Pratama et al., 2023).

Performance is therefore not assessed only by whether a task is completed, but also by whether the result is consistent with organizational authority, responsibility, standards, and ethical requirements. It can be viewed as the outcome of a work process evaluated over a defined period against previously established expectations (Hasmi et al., 2024; Syach et al., 2023).

Following Safitri as cited in Pratama et al. (2023), employee performance was represented by four dimensions: work quality, work quantity, reliability, and attitude. Work quality concerns accuracy and the standard of completed work, while quantity reflects the volume of tasks that can be completed. Reliability captures consistency, initiative, diligence, and the ability to follow work requirements. Attitude refers to employees' behavior toward the organization, colleagues, assigned duties, and cooperation in the workplace.

METHODOLOGY

A quantitative explanatory design was used to examine the effects of training and leadership on employee performance. The population comprised 126 employees of PT PLN Nusantara Power UP Punagaya Jeneponto. Using the Slovin formula, 96 employees were selected as respondents. Information was obtained through questionnaires supported by observation, interviews, documentation, and literature review. The instrument was first assessed for validity and reliability. Hypothesis testing was then conducted using multiple linear regression, partial t-tests, a simultaneous F-test, and the coefficient of determination (R^2), with data processing performed in SPSS version 24.

RESULTS

Table 2. Respondent Characteristics by Gender

No.	Gender	Frequency	Percentage
1	Male	95	99%
2	Female	1	1%
Total		**96**	**100%**

Source: Primary Data (Questionnaire), 2025

Of the 96 respondents, 95 were men (99%) and one was a woman (1%). Thus, the respondent profile was overwhelmingly male.

Table 3. Respondent Characteristics by Age

No.	Age	Frequency	Percentage
1	20–30 years	37	38.5%
2	31–40 years	59	61.5%
3	41–50 years	0	0%
4	Above 50 years	0	0%
Total		**96**	**100%**

Source: Primary Data (Questionnaire), 2025

The age distribution was concentrated in the 31–40-year group, which included 59 respondents (61.5%). A further 37 respondents (38.5%) were aged 20–30 years, while no respondent was recorded in either of the older age categories.

Table 4. Respondent Characteristics by Educational Level

No.	Educational Level	Frequency	Percentage
1	Senior High School/Vocational High School	44	45.8%
2	Diploma III (D3)	14	14.6%
3	Bachelor's Degree (S1)	36	37.5%
4	Master's Degree (S2)	2	2.1%
Total		**96**	**100%**

Source: Primary Data (Questionnaire), 2025

Educational backgrounds varied across the sample. Senior high school or vocational high school graduates accounted for 44 respondents (45.8%), followed by bachelor's degree holders with 36 respondents (37.5%). Fourteen respondents (14.6%) held Diploma III qualifications, and two respondents (2.1%) held master's degrees.

Table 5. Respondent Characteristics by Length of Service

No.	Length of Service	Frequency	Percentage
1	0–1 year	2	2.1%
2	2–3 years	0	0%
3	4–5 years	0	0%
4	More than 5 years	94	97.9%
Total		**96**	**100%**

Source: Primary Data (Questionnaire), 2025

Most respondents were experienced employees. Ninety-four respondents (97.9%) had worked for more than five years, whereas only two respondents (2.1%) reported a tenure of 0–1 year. No respondents were recorded in the 2–3-year or 4–5-year categories.

Table 6. Validity Test Results

Indicator	r-count	r-table	Description
Training			
X1.1	0.508	0.2006	Valid
X1.2	0.605	0.2006	Valid
X1.3	0.680	0.2006	Valid
X1.4	0.737	0.2006	Valid
X1.5	0.623	0.2006	Valid
X1.6	0.703	0.2006	Valid
Leadership			
X2.1	0.712	0.2006	Valid
X2.2	0.755	0.2006	Valid
X2.3	0.658	0.2006	Valid
X2.4	0.802	0.2006	Valid
X2.5	0.732	0.2006	Valid
Employee Performance			
Y.1	0.447	0.2006	Valid
Y.2	0.402	0.2006	Valid
Y.3	0.473	0.2006	Valid
Y.4	0.329	0.2006	Valid

Source: IBM SPSS 24 Output, 2025

Validity testing used N = 96 at a 5% significance level. With degrees of freedom calculated as N − 2 = 94, the reference correlation value (r-table) was 0.2006.

Every item measuring training, leadership, and employee performance produced an r-count above 0.2006. On this basis, all questionnaire items met the validity criterion and were retained for subsequent analysis.

Table 7. Reliability Test Results

Variable	Cronbach's Alpha	Number of Items	Description
Training	0.703 > 0.60	6	Reliable
Leadership	0.779 > 0.60	5	Reliable
Employee Performance	0.646 > 0.60	4	Reliable

Source: IBM SPSS 24 Output, 2025

Internal consistency was also acceptable for all variables. Cronbach's alpha was 0.703 for training, 0.779 for leadership, and 0.646 for employee performance. Because each coefficient exceeded the study's minimum criterion of 0.60, the three scales were treated as reliable.

Table 8. Multiple Linear Regression Analysis Results

Model	B	Std. Error	Beta	t	Sig.
Constant	2.132	0.336	–	6.350	0.000
Training	0.266	0.091	0.308	2.911	0.005
Leadership	0.241	0.088	0.290	2.741	0.007

Dependent Variable: Employee Performance
Source: IBM SPSS 24 Output, 2025

The unstandardized coefficients in Table 8 were used to construct the multiple regression equation shown below.

$$Y = \alpha + b_1X_1 + b_2X_2$$
$$Y = 2.132 + 0.266X_1 + 0.241X_2$$

The equation can be interpreted as follows:

a. **Constant (α)**
   The intercept of 2.132 represents the estimated employee-performance score when the values of training and leadership are set at zero in the regression model.
b. **Training Regression Coefficient (X_1)**
   The coefficient for training is 0.266. Holding leadership constant, a one-unit increase in the training score is associated with an estimated 0.266-unit increase in employee performance.
c. **Leadership Regression Coefficient (X_2)**
   The leadership coefficient is 0.241. With training held constant, an increase of one unit in leadership is associated with an estimated 0.241-unit rise in employee performance.

For the partial significance tests, the critical t value was 1.98580, obtained at $\alpha = 0.05$ with 93 degrees of freedom.

Training produced $t = 2.911$ with $p = 0.005$. Because the observed t value exceeded the critical value and the probability was below 0.05, the training coefficient was statistically significant in predicting employee performance.

Leadership yielded $t = 2.741$ and $p = 0.007$. These values likewise indicate a statistically significant partial effect of leadership on employee performance.

Table 9. Simultaneous Test (F-Test) Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.104	2	1.052	17.773	0.000
Residual	5.505	93	0.059		
Total	7.610	95			

Dependent Variable: Employee Performance
Predictors: (Constant), Leadership, Training
Source: IBM SPSS 24 Output, 2025

The simultaneous test used an F-table value of 3.09 for the relevant degrees of freedom.

The regression model produced F = 17.773 with p < 0.001. Since the observed F value was higher than 3.09, training and leadership jointly provided a statistically significant explanation of variation in employee performance.

Table 10. Coefficient of Determination (R^2) Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.526	0.277	0.261	0.24331

Predictors: (Constant), Leadership, Training

Source: IBM SPSS 24 Output, 2025

The model yielded R^2 = 0.277. Accordingly, training and leadership together accounted for 27.7% of the observed variation in employee performance. The remaining 72.3% was associated with factors outside the model, such as motivation, discipline, work environment, compensation, organizational culture, or other unmeasured influences.

DISCUSSION

The Effect of Training on Employee Performance

The partial test supports a positive association between training and employee performance. Training produced t = 2.911 with p = 0.005, indicating that differences in training were significantly related to differences in employee performance after leadership was considered in the model. This result suggests that structured capability development remains relevant in a technically demanding workplace such as a power-generation unit.

The result is consistent with Syach et al. (2023), who also reported a significant contribution of training to employee performance. In the present context, the finding is particularly important because the preliminary observation indicated unequal access to training. Improving the relevance and distribution of development opportunities may therefore help reduce competency gaps while strengthening employees' capacity to meet operational demands.

The Effect of Leadership on Employee Performance

Leadership was also a significant predictor of performance (t = 2.741; p = 0.007). The result implies that employee performance is influenced not only by technical capability but also by the way leaders communicate direction, provide support, and coordinate work. In an operational environment that requires safety, reliability, and cross-unit coordination, consistent leader–employee interaction can be especially important.

This pattern aligns with the findings of Shelamita, Nur, and Ilahi (2023), who identified a positive and significant relationship between leadership and employee performance. For UP Punagaya, the result reinforces the need for leadership practices that are visible in day-to-day work, including clearer communication, more frequent feedback, and meaningful employee involvement rather than relying solely on formal authority.

The Effect of Training and Leadership on Employee Performance

When entered together, training and leadership significantly predicted employee performance ($F = 17.773$; $p < 0.001$). The result indicates that capability development and leadership should not be treated as separate organizational concerns. Training can strengthen what employees are able to do, while leadership helps create the direction, support, and work conditions in which those capabilities are applied.

The simultaneous finding is in line with Agustin et al. (2024), who reported that training and leadership style jointly influenced performance. In practical terms, the result suggests that investments in training may produce stronger organizational value when accompanied by leadership practices that encourage employees to use newly acquired knowledge and skills in their daily assignments.

The Relationship between Training and Leadership and Employee Performance. Although the overall regression model was significant, the R^2 value of 0.277 shows that the two predictors explained only 27.7% of performance variation. This is a meaningful but limited share, indicating that employee performance at UP Punagaya is also shaped by other conditions not examined in this study, including motivation, discipline, work environment, compensation, organizational culture, and potentially job-specific technical factors.

Accordingly, the findings should not be interpreted to mean that training and leadership are the sole determinants of performance. Their statistically significant contributions coexist with a substantial amount of unexplained variation, which provides a basis for expanding the model in future studies.

CONCLUSIONS AND RECOMMENDATIONS

This study examined whether training and leadership contribute to employee performance at PT PLN Nusantara Power UP Punagaya Jeneponto. The empirical results provide evidence that both predictors are relevant, although the explanatory power of the model remains limited.

Training showed a positive and statistically significant partial effect ($t = 2.911$; $p = 0.005$), while leadership also demonstrated a significant partial effect ($t = 2.741$; $p = 0.007$). These results indicate that both employee capability development and leadership practices are associated with performance outcomes in the study setting.

The joint test further confirmed that training and leadership significantly explained employee performance ($F = 17.773$; $p < 0.001$). Organizations should therefore consider improving the quality and equitable availability of training while strengthening direct communication, feedback, and support from leaders.

The model explained 27.7% of the variance in employee performance ($R^2 = 0.277$), leaving 72.3% attributable to factors outside the model. Future research should therefore incorporate additional predictors such as work motivation, discipline, compensation, work environment, and organizational culture, and may use broader samples or longitudinal designs to obtain a more comprehensive explanation of performance.

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