

The Effect of Self-Efficacy and Job Design on Employee Performance Through Employee Engagement as an Intervening Variable at PT X

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Abstract. *This study was designed to investigate several aspects of the relationship between variables: (1) The influence of Self-Efficacy on Employee Engagement among PT X employees, (2) the influence of Job Design on Employee Engagement among PT X employees, (3) The influence of Self-Efficacy on Employee Performance at PT X, (4) the influence of Job Design on Employee Performance at PT X, (5) the influence of Employee Engagement on Employee Performance at PT X, (6) Employee Engagement as an Intervening Variable between Self-Efficacy and Employee Performance at PT X, (7) the role of Employee Engagement as an Intervening Variable between Job Design and Employee Performance at PT X. This research methodology is explanatory research with a quantitative approach. The sampling technique used was purposive sampling, involving 145 employees of PT X. Data collection was carried out through questionnaires. Data analysis was performed using SEM-PLS (Structural Equation Model with Partial Least Squares) software, a method chosen to test complex causality and mediation models. The results show that: (1) Self-Efficacy has a positive and significant effect on Employee Engagement, (2) Job Design has a positive and significant effect on Employee Engagement, (3) Self-Efficacy has a positive and significant effect on Employee Performance, (4) Job Design has a positive and significant effect on Employee Performance, (5) Employee Engagement has a positive and significant effect on Employee Performance, (6) Employee Engagement as an Intervening Variable between Self-Efficacy and Employee Performance mediates partially, (7) Employee Engagement as an Intervening Variable between Job Design and Performance mediates partially.*

Keywords: *Employee Engagement and Employee Performance; Job Design; Self-efficacy.*

1. Introduction

These demands for high-level precision and operational efficiency are clearly faced by PT X (PTRI), a Japanese Foreign Investment (PMA) company operating in the electronics component manufacturing sector. Referring to the KBLI Code 26120 ("Semiconductor and Other Electronic Components Industry"), PT X produces high-tech components such as Electrolytic Aluminum Capacitors. These products supply crucial global markets, including Europe, East Asia (such as China), Southeast Asia, and West Asia.

Operating in Batamindo Industrial Estate and Panbil Industrial Estate in Batam City since 1994, PT X has shouldered massive supply chain responsibilities. Over the past decade, the principal management in Japan has streamlined its production facilities globally. Operational facilities previously spread across Taiwan, South Korea, and Singapore have been closed, so that the entire production burden is now centralized in just two countries: Japan and Indonesia (Batam). Batam was chosen because of its strategic location directly adjacent to Singapore's 24-hour logistics route. With this centralization and the support of 1,116 workers (as of December 2025), PT X is required to operate at a high level of efficiency with zero tolerance for production defects.

However, the principal management's idealistic expectations clashed with operational realities on the ground. Based on PT X's operational Key Performance Indicators (KPIs), a declining productivity trend was observed, characterized by declining machine efficiency and increasing material losses (scrap) over the past five years (2021–2025).

Table 1.1 Trends in Machine Efficiency Achievement at PT X

(2021-2025)

Factory	2021	2022	2023	2024	2025	5 Year Average	Trend
FTY-1	84.63	84.41				84.52	-
FTY-2	84.87	87.66	88.60	89.33	88.07	87.71	Down
FTY-3	79.93	83.18	81.21	80.72	76.62	80.33	Down
FTY-4	82.31	82.10	80.73	77.66	76.83	79.93	Down
FTY-5	57.74	61.37	60.72			59.94	-
FTY-6	87.43	79.51	82.40	84.30	81.70	83.07	Down
FTY-7	76.86	69.31	61.35	58.40		66.48	-
FTY-8	58.61	58.10	57.82	58.39	58.05	58.19	Down
FTY-9	61.44	67.58	62.94	65.63	64.81	64.48	Down
Trend	74.87	74.80	71.97	73.49	74.35	73.90	

Some factories are indeed in Stop Operation status, which is part of the operational dynamics to prepare for new product lines. However, the crucial anomaly is that factories that are actively operating (such as FTY-2, FTY-3, FTY-4, and FTY-6) uniformly show a downward trend in the final period (2024-2025). Considering that the calculation of the efficiency percentage is only based on running machines (not an average of machines that are off), the decline in efficiency from a peak of 83.18% to 76.62% (in FTY-3) or 80.73% to 76.83% (in FTY-4) is a pure decline in actual performance. This apparent decline in operational efficiency does not stand alone, but is accompanied by a systematic failure to maintain quality, which is characterized by an increase in the material loss ratio (scrap).

Table 1.2. Scrap Achievement Compared to PT X's Production Quantity (%)

Factory	2021	2022	2023	2024	2025	Average 5 Years	Trend
FTY-1	1.37	1.33				1.35	-
FTY-2	1.12	1.08	0.98	1.18	1.20	1.11	Go on
FTY-3	1.38	1.34	1.26	1.34	1.37	1.34	Go on
FTY-4	1.14	1.25	1.00	1.41	1.68	1.30	Go on
FTY-5	1.92	2.11	1.97			2.00	-
FTY-6	1.05	0.90	1.26	1.15	1.05	1.08	Down
FTY-7	1.50	1.83	2.16	1.78		1.82	-
FTY-8	1.72	1.95	2.15	1.95	1.93	1.94	Go on
FTY-9	2.85	2.52	1.97	2.30	2.35	2.40	Go on
Trend	1.56	1.59	1.59	1.59	1.60	1.59	

Table 1.2 shows a highly concerning quality anomaly. The percentage of failed products (scrap) is actually creeping up in key factories that should be supporting efficiency. In FTY-4, for example, the scrap ratio jumped sharply from 1.00% in 2023 to 1.68% in 2025. The increase in the percentage of defective products also consistently occurred in FTY-2, FTY-3, FTY-8, and FTY-9. According to Heizer et al. (2020), high quality loss that fluctuates but trending downward in an active manufacturing ecosystem is a strong indication of decreased focus or human error.

2. Research Methods

This study employed a quantitative approach with explanatory research. According to Sugiyono (2019), quantitative methods are often referred to as traditional methods. This designation stems from their long-standing application and their roots in the positivist paradigm in scientific research. This method is specifically designed for investigations on

predetermined populations or samples, where data is collected through research instruments and statistically analyzed to verify formulated hypotheses.

Meanwhile, the explanatory research type was chosen because this research specifically aims to explain the position of the variables studied and prove the causal relationship (cause and effect) between these variables. In application, this research design is designed to prove the extent of the influence of the independent variables (Self-Efficacy and Job Design) on the dependent variable (Employee Performance) directly, as well as the indirect influence through the intervening/mediating variable (Employee Engagement) in the operational environment of PT X.

3. Results and Discussion

3.1. The Influence of Self-Efficacy on Employee Engagement and Performance

Statistical analysis shows a strong and positive relationship between self-efficacy and employee engagement at PT X. With a path coefficient of 0.572 and a significant T-statistic value (10.197), the highest among all variables in this research model, self-efficacy is identified as a key predictor of employee engagement. This underscores the importance of employees' perceptions of their capabilities. When they feel confident in their technical skills and ability to overcome operational obstacles, they demonstrate greater levels of dedication and energy in carrying out production tasks.

These empirical findings are consistent with Bandura's (1997) Social Cognitive Theory framework, which emphasizes the central role of self-efficacy in shaping individual perceptions, emotions, and motivation. In the electronics manufacturing environment of PT X, the concept of self-efficacy goes beyond general self-beliefs; it encompasses confidence in operational capabilities to effectively execute complex standard procedures. Individuals with strong self-efficacy tend to interpret challenging tasks as opportunities for development, rather than as potential failures. This proactive attitude directly contributes to the dimensions of employee engagement, namely Vigor (energy), Dedication (pride), and Absorption (focus), as defined by Schaufeli et al. (2002).

In conclusion, PT X's management needs to recognize that creating an engaged workforce requires interventions not only focused on physical facilities but also on strengthening employee mentality. Training programs designed to enhance mastery experiences will automatically increase self-efficacy, which in turn will maintain optimal employee engagement. This highly significant relationship ($T=10.197$) confirms that self-efficacy is the "upstream" of all productivity flows within an organization.

Through this study, we successfully identified and filled a gap in the research literature, which previously tended to focus on external determinants such as remuneration as the primary

driver of employee engagement. Our findings align with broader research, including the work of Luthans et al. (2007), which indicates that internal psychological aspects, such as self-efficacy, demonstrate a more consistent relationship with employee engagement levels than situational factors. In the operational context of PT X, which demands high levels of accuracy and efficiency, employees' intrinsic beliefs have been shown to serve as a psychological foundation that maintains their commitment to their tasks, even amidst the pressure of intense production targets.

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Thus, the results of this study strengthen the Social Cognitive theory (Bandura, 1997) and prove that in the work environment of PT X, self-efficacy is an effective instrument to minimize scrap rates and achieve daily production volume targets.

3.2. The Influence of Job Design on Employee Engagement and Performance

The analysis results show that Job Design has a positive and significant effect on Employee Engagement with a path coefficient of 0.499 and a T-statistic of 9.205. This finding confirms that a well-designed job structure at PT X plays a significant role in creating work engagement. Task structuring that provides clarity of workflow, skill variety, and technical autonomy has been scientifically proven to generate employee enthusiasm in carrying out daily responsibilities. The implications of this finding are in line with the Job Characteristics Model proposed by Hackman and Oldham (1976). This model proposes that intrinsic elements in work, such as the level of autonomy given to employees to determine their work methods and clear feedback on performance effectiveness, contribute to the creation of positive perceptions and deep job satisfaction. In the context of PT X, observations indicate that task structuring practices that give employees greater control over their work processes (autonomy) and a transparent reporting system on achievement results (feedback) have been shown to foster a sense of competence and recognition, which are important foundations for work engagement. This sense of appreciation is the bridge to Employee Engagement. When work is systematically designed, employees work not only mechanically but also emotionally. Compared with previous research, these results fill the gap regarding job burnout in the manufacturing industry. Much previous research has suggested that production line work tends to be repetitive and boring, thus reducing engagement. However, findings at PT X demonstrate that with appropriate job design, these routine barriers can be overcome. These findings are also supported by the theoretical framework of Job Demands-Resources (JD-R) Theory by Bakker and Demerouti (2007). This theory explains how resources available in the

workplace, including the quality of the task design itself, can serve as catalysts for employees' internal motivational processes. By providing adequate resources, such as well-structured and engaging tasks, organizations can encourage employees to be more engaged and motivated, which in turn increases their level of engagement with their work.

The conclusion of this study confirms that the arrangement of work tasks and responsibilities (job design) has a substantial positive impact on organizational performance. Therefore, the management of PT X is encouraged to continuously evaluate Standard Operating Procedures (SOPs) and actively facilitate employees to express ideas related to their work processes. The significance of the relationship is very high ($T = 9.205$), indicating that the creation of a work system that considers psychological well-being while being technically optimal is an essential foundation in maintaining a high level of employee dedication to the company.

3.3. The Influence of Self-Efficacy on Employee Performance

The results of statistical tests prove that Self Efficacy has a positive and significant effect on Employee Performance with a coefficient of 0.329 and a T-statistic value of 5.972. These results indicate that the self-confidence of PT X employees has a direct impact on the achievement of work targets, product quality, and timeliness. Employees who are confident in their abilities tend to be more diligent and able to persist when facing technical obstacles, so that the work results produced are more optimal than employees who have self-doubt. Theoretically, this relationship is in line with the concept of performance accomplishments from Bandura (1997), where self-efficacy acts as a strong predictor of actual performance. Individuals with high self-efficacy will set higher personal standards and use more effective problem-solving strategies.

This empirical finding has significant academic relevance because it successfully addresses and addresses a research gap identified in Noviawati's (2016) study, which stated that self-confidence or self-efficacy does not consistently influence performance improvement in specific operational contexts. However, research findings at PT X contradict this generalization. This contextual difference in results stems from the highly demanding nature of the precision electronics component manufacturing industry.

Employees with high levels of self-efficacy have been shown to be more adaptable and calm when faced with technical challenges on the production floor, such as machine breakdowns or the need to adapt to new automation systems (PLCs). This confidence reduces work anxiety levels, minimizes mishandling of microscopic components, ultimately mathematically reducing the percentage of defective products (scrap) and boosting the company's overall operational performance.

At PT X, this is reflected in the employees' ability to reduce scrap (defective products). Self-confidence allows employees to work with more stable motor and cognitive control, which is crucial in the high-precision electronic component assembly process.

3.4. The Influence of Job Design on Employee Performance

The effect of Job Design on Employee Performance shows a path coefficient value of 0.261 with a T-statistic of 3.527. Although this path has the lowest T-value compared to other paths in the model, the results are still significant and above the threshold of 1.96. This indicates that the structuring of tasks and the work environment at PT X directly contribute to the effectiveness of employee work results, although the influence is not as strong as internal factors (efficacy) or mediator factors (engagement). Theoretical support for this result refers to the principles of modernized Scientific Management, where job design efficiency aims to reduce unnecessary movements and optimize production time. Morgeson and Humphrey (2006) stated that job design includes not only social aspects but also task aspects that are mechanistically related to performance output. At PT X, good job design ensures that each position on the production line has a balanced workload and clear instructions, thereby reducing the risk of procedural errors that can hinder overall performance.

Furthermore, while the results of this study successfully address a previous study by Daud and Masman (2025), which found that job design had no significant impact on performance, findings at PT X actually prove the opposite. This difference in results occurs because the characteristics of the electronic component manufacturing industry in Batam are highly dependent on precise production line work rhythms. When the company redesigned jobs to address the personnel shortage crisis and minimize double workloads (overload), it was able to instantly reduce the number of defective products (scrap) and increase employee operational efficiency.

These results compare favorably with previous research that often found a very strong relationship between job design and performance. The relatively smaller coefficient value at PT X (0.261) suggests that in a highly standardized manufacturing industry, job design may have reached a saturation point where all employees adhere to the same rigid SOPs. Therefore, performance improvement no longer depends solely on task design, but is more influenced by the human factors performing the tasks. In conclusion, job design remains a prerequisite for achieving performance at PT X. Without good design, performance is impossible. However, management must understand that simply improving SOPs or (physical) workflows has limited effectiveness in boosting performance. To achieve higher performance leaps, job design must be combined with strengthening work engagement.

3.5. The Influence of Employee Engagement on Employee Performance

The analysis results show that Employee Engagement has a positive and significant effect on Employee Performance with a coefficient of 0.449 and a T-statistic of 5.742. This finding proves that the level of emotional attachment of employees to their work is a very strong determining factor for organizational success. Employees who feel engaged do not only work to meet operational hours, but they have a moral responsibility to provide the best results for the company. Theoretically, this finding is in line with Kahn's (1990) psychological detachment framework which emphasizes that employee engagement is not merely physical presence, but rather the full manifestation of physical, cognitive, and emotional aspects in carrying out tasks. In the context of PT X, the author observed how employees with high engagement demonstrated dedication as seen from their proactivity in finding solutions when there were obstacles in the production line, rather than simply waiting for instructions. This is supported by the Broaden-and-Build Theory (Fredrickson, 2001), which states that positive emotions (such as those in engagement) expand a person's ability to think and act, which ultimately improves work performance cumulatively.

Comparisons with previous research show significant consistency. A 2020 study by Gallup found that globally, highly engaged work units have 21% higher productivity. Research at PT X confirms this global phenomenon in the local context of Batam. Work engagement acts as an internal energy source that keeps employees resilient in the face of the pressures of a dynamic manufacturing industry, making it easier to achieve quality targets (such as zero defects).

Employee Engagement is a strategic investment. PT X's management should not view engagement merely as an additional "welfare" program, but rather as a driver of profitability through improved employee performance. The significant T-score (5.742) provides a scientific mandate for the company to prioritize a work culture that fosters employee engagement for the sake of sustaining the company's competitive advantage.

4. Conclusion

Self-efficacy has a positive and significant impact on employee engagement among PT X employees. The higher an individual's confidence in their abilities, the stronger their engagement with their work. Job design has a positive and significant impact on employee engagement. Work structures that provide variety and clear feedback have been shown to increase employee energy and dedication. Self-efficacy has a positive and significant effect on employee performance. Strong technical confidence helps employees minimize operational errors (human error). Job Design has a positive and significant effect on Employee Performance. Providing autonomy in job design accelerates the technical decision-making process in the field.

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