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The Effects of Intrinsic and Extrinsic Motivation on Employee Performance: The Mediating Role of Employee Ability

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ABSTRACT

This study aims to examine the effects of intrinsic and extrinsic motivation on employee performance and to analyze the mediating role of employee ability at PG Gempolkrep, PT Sinergi Gula Nusantara Mojokerto. A quantitative explanatory research design was employed. The population consisted of 124 permanent employees, and a census sampling technique was applied by involving all members of the population as research respondents. Data were collected through a structured questionnaire measured on a five-point Likert scale and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS to assess the measurement model, structural model, direct effects, and mediation effects. The findings show that intrinsic motivation and extrinsic motivation have positive and significant effects on employee performance and employee ability, while employee ability also has a positive and significant effect on employee performance. Moreover, employee ability partially mediates the effects of both intrinsic and extrinsic motivation on employee performance. These results indicate that sustainable performance improvement requires the simultaneous strengthening of employee motivation and capability. This study contributes to the literature by positioning employee ability not only as a direct determinant of performance but also as a mediating mechanism that explains how motivational factors are translated into performance outcomes, particularly within the relatively underexplored context of the sugar manufacturing industry.

INTRODUCTION

The sustainability of the sugar manufacturing industry in Indonesia requires organizations to continuously enhance employee performance as a key determinant of productivity and operational effectiveness. Individual employee performance represents an important outcome in human resource management because it reflects employees' contribution to achieving organizational objectives and operational effectiveness (Bos-Nehles et al., 2023). Increasing production demands, fluctuations in sugarcane availability, and the need for operational efficiency require employees who are not only motivated but also capable of performing their responsibilities effectively. This issue is particularly relevant at PG Gempolkrep, PT Sinergi Gula Nusantara Mojokerto, where organizational success depends not only on production resources and technological capability but also on the quality and contribution of human resources. Operational data indicate that sugar production at PG Gempolkrep increased from 57,123.5 tons in 2023 to 60,948.94 tons in 2024 and 67,812 tons in 2025. Similarly, sugarcane production increased from 712,836 tons in 2023 to 783,067 tons in 2024 and 957,110 tons in 2025. However, despite this increase in production volume, the yield ratio decreased from 8.01 in 2023 to 7.76 in 2024 and further declined to 7.08 in 2025. This condition indicates that increased production output does not necessarily represent optimal employee performance and highlights the importance of strengthening human resource management practices to improve individual work effectiveness.

Employee performance conditions at PG Gempolkrep can also be observed through the Key Performance Indicator (KPI) assessment. The KPI system evaluates employee achievement based on predetermined performance targets classified into five categories: *outstanding*, *above target*, *on target*, *below target*, and *poor*. The distribution of employee performance categories during 2023–2025 is presented in Table 1.

Table 1. Recapitulation of Employee KPI Assessment Results at PG Gempolkrep PT Sinergi Gula Nusantara Mojokerto, 2023–2025

Year	Employee Group	Outstanding	Above Target	On Target	Below Target	Poor
2023	Management Employees	2	4	10	4	1
	Operational Employees	–	5	104	33	9
2024	Management Employees	6	6	8	–	–
	Operational Employees	5	15	92	15	–
2025	Management Employees	3	1	12	–	–
	Operational Employees	3	8	77	20	–

Source: Human Resources Department of PG Gempolkrep (processed by the researcher, 2026).

As shown in Table 1, most employees were classified as *on target* during the 2023–2025 period. However, employees who failed to achieve expected performance standards remained, particularly among operational employees. In 2023, 33 operational employees were categorized as *below target* and 9 employees as *poor*. Although the number of employees in the *below target* category decreased to 15 employees in 2024, it increased again to 20 employees in 2025. The persistence of employees who have not achieved expected performance levels indicates that improvements in production capacity and organizational development initiatives have not fully resulted in consistent individual performance. Therefore, identifying the factors that influence individual employee performance remains an important issue in human resource management.

Employee performance is influenced by various individual and organizational factors, among which motivation and ability represent important determinants. Previous studies have emphasized that employee performance is shaped by the interaction between employees' willingness to exert effort and their capability to execute work effectively (Appelbaum et al., 2000; Bos-Nehles et al., 2023). Motivation reflects employees' willingness and psychological drive to perform work activities, whereas employee ability represents the knowledge, skills, and experience required to complete tasks effectively (Ryan & Deci, 2020; Appelbaum et al., 2000). Motivation can be categorized into intrinsic and extrinsic motivation, which represent different sources of employee effort and work behavior (Ryan & Deci, 2020). Previous studies have demonstrated that motivation contributes significantly to employee performance; however, empirical findings regarding the effects of different motivational dimensions remain inconsistent. Some studies report positive effects of intrinsic and extrinsic motivation on performance, whereas others suggest that motivational effects depend on contextual factors and underlying mechanisms (Gagné et al., 2022; Kuvaas et al., 2021).

In addition to motivation, employee ability represents an essential factor determining whether employees can transform their effort into effective performance outcomes. Employees may possess strong motivation but fail to achieve optimal results when they lack sufficient knowledge, skills, and experience. Conversely, employees with adequate ability may not demonstrate high performance without sufficient motivation. This perspective is consistent with the motivation–ability approach, which suggests that performance emerges from the interaction between employees' willingness and capability (Appelbaum et al., 2000). Previous studies have demonstrated that employee ability contributes to performance outcomes by enabling employees to utilize their knowledge and skills effectively in completing their responsibilities (Alqudah et al., 2022; Bos-Nehles et al., 2023).

Although previous studies have extensively examined the relationship between motivation and employee performance, several limitations remain. First, many studies have focused on motivation as a general construct, providing limited understanding of the different effects of intrinsic and extrinsic motivation. Second, previous research has predominantly examined direct relationships between motivation and performance, while limited attention has been given to the mechanism through which motivation is transformed into performance outcomes. In particular, the role of employee ability as a mediating mechanism remains insufficiently explored (Afsar et al., 2021; Saks, 2022).

Therefore, this study addresses this research gap by developing an integrated model that examines how intrinsic motivation and extrinsic motivation influence employee performance through employee ability. This study contributes theoretically by extending motivation–performance research through explaining the mechanism that connects motivational factors with performance outcomes. Empirically, this research provides evidence from the sugar manufacturing industry context, which remains relatively underexplored in previous motivation and performance studies. Practically, the findings provide implications for organizations in designing employee motivation strategies, competency development programs, training initiatives, and performance improvement practices. Accordingly, the objective of this study is to analyze the effects of intrinsic motivation and extrinsic motivation on employee performance with employee ability as a mediating variable at PG Gempolkrep, PT Sinergi Gula Nusantara Mojokerto.

LITERATURE REVIEW

Theoretical Foundation

Employee performance is one of the central outcomes in human resource management because it reflects employees' ability to contribute to organizational effectiveness. Previous research suggests that employee performance is not determined by a single factor but emerges from the interaction between employees' motivation and capability. The motivation–ability perspective proposed by Gomes (2003) explains that performance is a function of motivation and ability ($P = f(m \times a)$), indicating that employees require both willingness and competence to achieve optimal work outcomes. This perspective is consistent with the Ability-Motivation-Opportunity (AMO) framework, which emphasizes that employee outcomes are influenced by employees' ability and motivation. Employee ability represents the knowledge, skills, and experience required to perform tasks effectively, whereas motivation reflects employees' willingness and effort to achieve organizational objectives (Appelbaum et al., 2000). Recent studies have further emphasized that motivation-related factors and employee ability interact in shaping individual performance outcomes (Bos-Nehles et al., 2023). Furthermore, Self-Determination Theory (SDT) provides an important explanation regarding different forms of employee motivation. SDT distinguishes motivation into intrinsic and extrinsic motivation, where intrinsic motivation originates from internal satisfaction, enjoyment, and personal growth, whereas extrinsic motivation arises from external factors such as rewards, recognition, and organizational support (Ryan & Deci, 2020). Therefore, this study proposes that intrinsic and extrinsic motivation may influence employee performance, while employee ability may serve as a mechanism explaining how motivation is translated into performance outcomes.

The Effect of Intrinsic Motivation on Employee Performance

Intrinsic motivation refers to the internal desire of employees to perform work because they experience satisfaction, enjoyment, achievement, responsibility, opportunities for personal development, and willingness to perform work based on personal motivation and interest. Employees with high intrinsic motivation are more likely to demonstrate autonomous work behavior because their effort is driven by internal values rather than external pressure (Ryan & Deci, 2020). Intrinsic motivation can encourage employees to demonstrate persistence, creativity, and greater involvement in their tasks. When employees perceive their work as meaningful, they are more likely to invest effort, maintain commitment, and achieve better work outcomes. Recent studies have shown that autonomous forms of motivation are associated with positive employee outcomes, including stronger engagement, proactive behavior, and improved performance (Gagné et al., 2022). However, previous research has predominantly examined intrinsic motivation as a direct determinant of employee performance. Although existing studies have confirmed the importance of intrinsic motivation, limited research has investigated the underlying mechanism through which intrinsic motivation is transformed into actual performance outcomes. Specifically, the role of employee ability as a mechanism connecting intrinsic motivation and performance remains insufficiently explored. Therefore, this study extends previous research by examining whether intrinsic motivation directly contributes to employee performance:
H1: Intrinsic motivation has a positive and significant effect on employee performance.

The Effect of Extrinsic Motivation on Employee Performance
Extrinsic motivation represents external motivational factors that encourage employees to increase their work contribution and achieve organizational objectives. External motivational mechanisms can influence employee behavior by strengthening effort, goal orientation, and commitment toward work responsibilities. According to Self-Determination Theory, extrinsic motivation can generate positive outcomes when external factors are perceived as supportive and meaningful rather than controlling (Ryan & Deci, 2020). When employees perceive that their contributions are valued through organizational support and appropriate motivational practices, they are more likely to demonstrate greater effort and commitment in completing their tasks. Recent studies indicate that external motivational factors contribute to employee outcomes by encouraging employees to improve their work contribution and achieve performance targets (Gagné et al., 2022). Furthermore, Kuvaas et al. (2021) emphasized that the effectiveness of extrinsic motivation depends on how employees perceive and internalize external motivational factors within their work environment. However, previous research has shown that the relationship between extrinsic motivation and employee performance may vary depending on contextual factors and the mechanisms through which motivation influences employee behavior. This indicates the need to further examine how extrinsic motivation contributes to employee performance within different organizational settings. Therefore, this study examines the direct effect of extrinsic motivation on employee performance:
H2: Extrinsic motivation has a positive and significant effect on employee performance.

The Effect of Employee Ability on Employee Performance
Employee ability represents employees' capability to perform their responsibilities effectively through adequate competencies and work-related capabilities. Ability is considered an essential individual resource because employees require sufficient capability to transform their effort and motivation into effective work outcomes. From the motivation–ability perspective, employee performance depends not only on employees' willingness to work but also on their capacity to execute tasks successfully (Appelbaum et al., 2000). Therefore, employees with stronger abilities are better equipped to handle job demands and achieve organizational targets (Appelbaum et al., 2000; Bos-Nehles et al., 2023). Recent human resource studies have demonstrated that employee ability contributes significantly to performance outcomes because competent employees are better able to utilize their capabilities in completing work responsibilities. Employees with higher levels of ability tend to demonstrate greater work effectiveness, productivity, and task accomplishment because they possess the competencies required to meet job demands (Alqudah et al., 2022; Hidayat et al., 2024). Furthermore, studies based on the AMO perspective indicate that employee ability represents an important factor that enables individuals to convert their effort into improved performance outcomes (Bos-Nehles et al., 2023). However, previous studies have mainly examined employee ability as a direct predictor of performance,

while limited research has explored how ability interacts with motivational factors in explaining employee outcomes. Although ability is recognized as an important determinant of performance, some studies suggest that capability alone may not guarantee superior performance without sufficient motivation and organizational support (Appelbaum et al., 2000; Jiang et al., 2022). Therefore, examining employee ability within an integrated motivation–performance framework provides a more comprehensive understanding of how employee performance is achieved. Based on this argument:
H3: Employee ability has a positive and significant effect on employee performance.

The Effect of Intrinsic Motivation on Employee Ability
Intrinsic motivation may influence not only employee performance but also employees' willingness to develop their own abilities. Employees with strong intrinsic motivation are more likely to engage in continuous learning, seek improvement opportunities, and enhance their competencies because personal growth and mastery are perceived as meaningful outcomes. According to Self-Determination Theory, autonomous motivation encourages individuals to regulate their own behavior, pursue competence development, and engage in continuous improvement activities (Ryan & Deci, 2020). Recent empirical studies indicate that intrinsic motivation contributes to employee development by encouraging proactive behavior, knowledge acquisition, and learning orientation. Gagné et al. (2022) demonstrated that autonomous motivation encourages employees to engage in behaviors that support personal growth and effectiveness. Similarly, Afsar et al. (2021) found that intrinsic motivational factors encourage proactive behaviors and individual development, which strengthen employees' capacity to adapt and perform effectively. However, previous research has predominantly focused on the consequences of intrinsic motivation, particularly employee performance, engagement, and job satisfaction (Gagné et al., 2022; Kuvaas et al., 2021). Limited studies have examined intrinsic motivation as an antecedent of employee ability development. Most previous studies position ability as a predictor of performance rather than as an outcome that can be strengthened through motivational processes. Therefore, this study addresses this gap by examining whether intrinsic motivation contributes to employee ability development. Based on these arguments, the following hypothesis is proposed:
H4: Intrinsic motivation has a positive and significant effect on employee ability.

The Effect of Extrinsic Motivation on Employee Ability
Extrinsic motivation may influence employee ability by creating conditions that encourage employees to improve their competencies and develop work-related capabilities. External motivational mechanisms can stimulate employees' willingness to participate in learning activities, acquire new knowledge, and strengthen their capabilities. From the AMO perspective, organizational practices that enhance motivation can facilitate ability development by providing conditions that support employee learning and capability improvement (Appelbaum et al., 2000). Recent studies have demonstrated that supportive human resource practices contribute to employee development by encouraging learning and capability improvement. Kooij et al. (2021) emphasized that supportive HR practices facilitate employee growth through opportunities for learning and development. Similarly, Boon et al. (2021) highlighted that HRM systems influence employee outcomes through the development of employee ability and motivation. Nevertheless, previous research has mainly examined extrinsic motivation as a direct predictor of employee performance rather than as an antecedent of employee ability. Existing studies provide limited explanation regarding how external motivational factors contribute to capability development before influencing performance outcomes. This limitation is important because external motivation may not automatically improve performance unless employees possess sufficient ability to utilize these motivational resources effectively. Therefore, this study investigates the effect of extrinsic motivation on employee ability. Accordingly, the following hypothesis is proposed:
H5: Extrinsic motivation has a positive and significant effect on employee ability.

The Mediating Role of Employee Ability in the Effect of Intrinsic Motivation on Employee Performance

Intrinsic motivation may influence employee performance through the development of employee ability. Employees with strong intrinsic motivation are more likely to engage in continuous learning, develop their knowledge and skills, and improve their ability to apply these capabilities effectively because they perceive mastery and personal growth as meaningful outcomes. These improved abilities enable employees to transform their motivation into effective work performance. Recent studies have emphasized that motivational factors influence performance through behavioral and ability-related mechanisms. Afsar et al. (2021) demonstrated that intrinsic motivation encourages proactive behaviors and individual development, which subsequently contribute to improved work outcomes. Furthermore, Saks (2022) highlighted that employee psychological factors influence performance through mechanisms involving employee behavior, capability, and work-related resources. However, previous studies have primarily examined the direct effect of intrinsic motivation on employee performance or investigated other mediating mechanisms such as engagement, creativity, and psychological empowerment (Afsar et al., 2021; Saks, 2022). Limited research has examined employee ability as a mediating mechanism explaining how intrinsic motivation is transformed into performance outcomes. This creates an important theoretical gap because motivation explains employees' willingness to perform, whereas ability explains whether employees possess the capability required to convert motivation into effective performance. Therefore, this study proposes employee ability as a mediating mechanism between intrinsic motivation and employee performance.
H6: Employee ability mediates the effect of intrinsic motivation on employee performance.

The Mediating Role of Employee Ability in the Effect of Extrinsic Motivation on Employee Performance

Extrinsic motivation may improve employee performance indirectly through employee ability development. External motivational factors, including rewards, recognition, promotion opportunities, organizational support, and external benefits provided by the organization, may encourage employees to participate in competency development activities and improve their work ability. These enhanced capabilities allow employees to utilize their motivation more effectively and achieve higher performance outcomes. The AMO framework explains that performance outcomes are produced through the interaction between ability and motivation, where motivation provides the willingness to perform and ability provides the capability required to achieve performance (Appelbaum et al., 2000). Recent studies support this perspective by demonstrating that HRM practices influence employee outcomes through ability and motivation mechanisms. Boon et al. (2021) found that HRM systems influence employee outcomes by strengthening employee ability and motivation, while Bos-Nehles et al. (2023) emphasized that employee ability represents an important pathway through which organizational practices influence performance. However, previous studies have largely focused on the direct relationship between extrinsic motivation and employee performance (Kuvaas et al., 2021; Gagné et al., 2022). Limited research has investigated whether employee ability explains the mechanism through which external motivational factors influence performance outcomes. This limitation suggests that the relationship between extrinsic motivation and performance may be better understood by considering employee ability as an intermediate mechanism. Therefore, this study proposes employee ability as a mediating mechanism linking extrinsic motivation and employee performance.
H7: Employee ability mediates the effect of extrinsic motivation on employee performance.

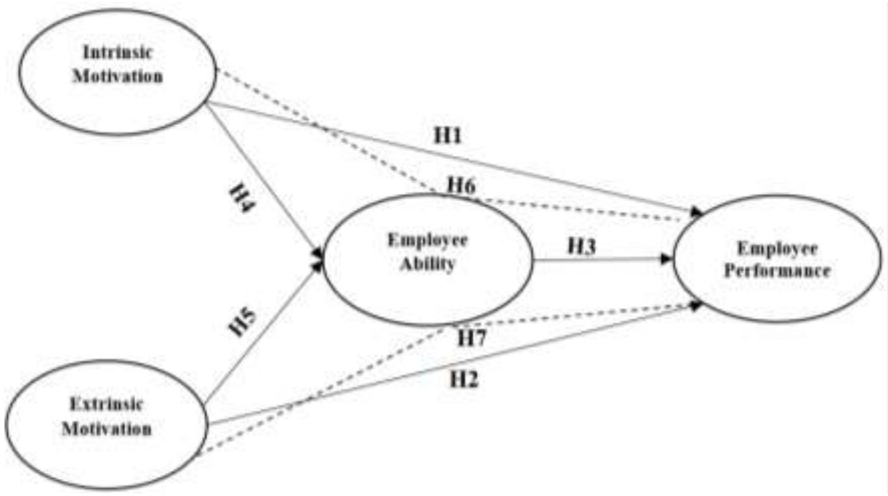

Figure 1. Research Conceptual Framework

METHOD

This study employed a quantitative research approach using an explanatory research design. The explanatory design was selected because this study aims to examine the hypothesized relationships among research variables and test the proposed hypotheses regarding the effects of intrinsic motivation and extrinsic motivation on employee performance through employee ability as a mediating variable. The research model consists of intrinsic motivation and extrinsic motivation as exogenous variables, employee ability as a mediating variable, and employee performance as an endogenous variable. This approach enables the investigation of both direct and indirect effects among constructs within the proposed research framework.

The study was conducted at PG Gempolkrep, PT Sinergi Gula Nusantara Mojokerto. The population consisted of all permanent employees of the organization. This research setting was selected because employee performance represents an important factor in supporting operational effectiveness and sustainability in the sugar manufacturing industry. The total population consisted of 124 permanent employees with different job responsibilities, work experiences, and organizational roles. Considering the relatively limited population size, this study applied a census sampling technique, where all members of the population were included as research respondents (Nwafor & Nworie, 2025). Therefore, the final sample consisted of 124 employees.

Data were collected using a structured questionnaire distributed to all permanent employees of PG Gempolkrep, PT Sinergi Gula Nusantara Mojokerto. The questionnaire was developed based on the operational definitions and measurement indicators of the research constructs, namely intrinsic motivation, extrinsic motivation, employee ability, and employee performance. All measurement items were assessed using a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). In addition to primary data obtained from questionnaires, secondary data from organizational documents were used to provide contextual information regarding the research setting and employee performance conditions.

The research constructs were measured using reflective indicators adapted from previous studies and adjusted to the organizational context. Intrinsic motivation was measured through six indicators reflecting internal drivers of employee behavior, namely enjoyment and interest in performing work (IM1), satisfaction obtained from completing work tasks (IM2), sense of achievement from work accomplishment (IM3), responsibility toward assigned tasks (IM4), opportunities for personal growth and self-development (IM5), and willingness to perform work based on personal motivation and interest

(IM6). Extrinsic motivation was measured through six indicators representing external factors that encourage employee performance, including financial rewards and compensation (EM1), recognition and appreciation from the organization (EM2), promotion and career advancement opportunities (EM3), supportive workplace conditions and organizational support (EM4), work-related incentives (EM5), and external benefits provided by the organization (EM6). Employee ability was measured using six indicators representing employees' capability to perform their responsibilities effectively, including job-related knowledge (EA1), skills required to complete assigned tasks (EA2), work experience supporting task execution (EA3), ability to solve work-related problems (EA4), ability to adapt to job demands and workplace changes (EA5), and ability to apply knowledge and skills effectively in completing work responsibilities (EA6). Employee performance was measured through six indicators reflecting individual work achievement, including quality of work outcomes (EP1), quantity of completed tasks (EP2), timeliness in completing responsibilities (EP3), efficiency in utilizing organizational resources (EP4), responsibility and cooperation in completing work activities (EP5), and consistency in achieving expected work targets (EP6).

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software. PLS-SEM was selected because it is appropriate for examining complex relationships among latent constructs and evaluating mediation effects within structural models (Hair et al., 2026). The analysis was conducted through two main stages, namely the evaluation of the measurement model (*outer model*) and the evaluation of the structural model (*inner model*) (Levigns et al., 2025). The measurement model was evaluated by assessing convergent validity, discriminant validity, and internal consistency reliability (Kadim et al., 2025). Convergent validity was examined through outer loading values and Average Variance Extracted (AVE). Discriminant validity analysis was conducted to ensure that each construct represented a distinct concept and that the measurement model demonstrated adequate construct differentiation. Internal consistency reliability was evaluated using Cronbach's Alpha and Composite Reliability values. The structural model was evaluated by examining the coefficient of determination (R^2), effect size (f^2), variance inflation factor (VIF), predictive relevance (Q^2), Standardized Root Mean Square Residual (SRMR) (Saw et al., 2025). The R^2 value was used to assess the explanatory capability of the endogenous constructs, while f^2 was examined to determine the contribution of each exogenous construct to the endogenous variables. The VIF value was evaluated to assess potential multicollinearity among predictor constructs and ensure that the structural model was free from critical collinearity issues. Predictive relevance was assessed using Q^2, and SRMR was examined as an approximate measure of model fit by measuring the difference between observed and predicted correlations. Hypothesis testing was performed using the bootstrapping procedure by evaluating path coefficients, t-statistics, and p-values. Furthermore, mediation analysis was conducted by examining the indirect effects of intrinsic motivation and extrinsic motivation on employee performance through employee ability to determine whether employee ability significantly mediates the proposed relationships.

RESULT AND DISCUSSION

Result

Demographic Characteristics of Respondents

The demographic characteristics of respondents provide an overview of the employee profiles involved in this study. A total of 124 permanent employees of PG Gempolkrep, PT Sinergi Gula Nusantara Mojokerto participated as respondents. The distribution of respondents based on gender, age, education level, length of service, and work division is presented in Table 2.

Table 2. Respondent Demographic Characteristics

Respondent Criteria	Frequency	Percentage
Gender		
Male	118	95.16%
Female	6	4.84%

Respondent Criteria	Frequency	Percentage
Age		
25–35 Years	10	8.06%
36–45 Years	61	49.19%
> 45 Years	53	42.74%
Education Level		
Senior High School or Equivalent	65	52.42%
Bachelor Degree (S1/D4)	55	44.35%
Master Degree (S2)	4	3.23%
Length of Service		
1–5 Years	6	4.84%
6–10 Years	8	6.45%
> 10 Years	110	88.71%
Work Division		
Installation	28	22.58%
Finance	21	16.94%
Processing	29	23.39%
Quality Assurance	11	8.87%
Plantation	35	28.23%
Total	124	100.00%

Source: Processed Research Data, 2026

The respondent profile shows that the majority of employees were male (95.16%), aged between 36–45 years (49.19%), and had worked for more than 10 years (88.71%). In terms of education, most respondents had a senior high school or equivalent background (52.42%), followed by bachelor degree holders (44.35%). Respondents were distributed across various work divisions, with the largest proportion coming from the Plantation (28.23%), Processing (23.39%), and Installation (22.58%) divisions. Overall, the demographic characteristics indicate that respondents had sufficient work experience and organizational knowledge to provide relevant evaluations regarding intrinsic motivation, extrinsic motivation, employee ability, and individual employee performance.

Inferential Analysis

The inferential analysis was conducted using PLS-SEM to examine the proposed hypotheses and evaluate the structural relationships among the research constructs. This analysis was performed to determine the magnitude and direction of the relationships between variables through the estimated path coefficients generated by the structural model. The results of the PLS-SEM analysis are presented in Figure 2, which illustrates the structural model estimation, including the relationships among the latent constructs and the corresponding path coefficients. The model estimation provides an overview of the extent to which each proposed relationship is supported based on the empirical data.

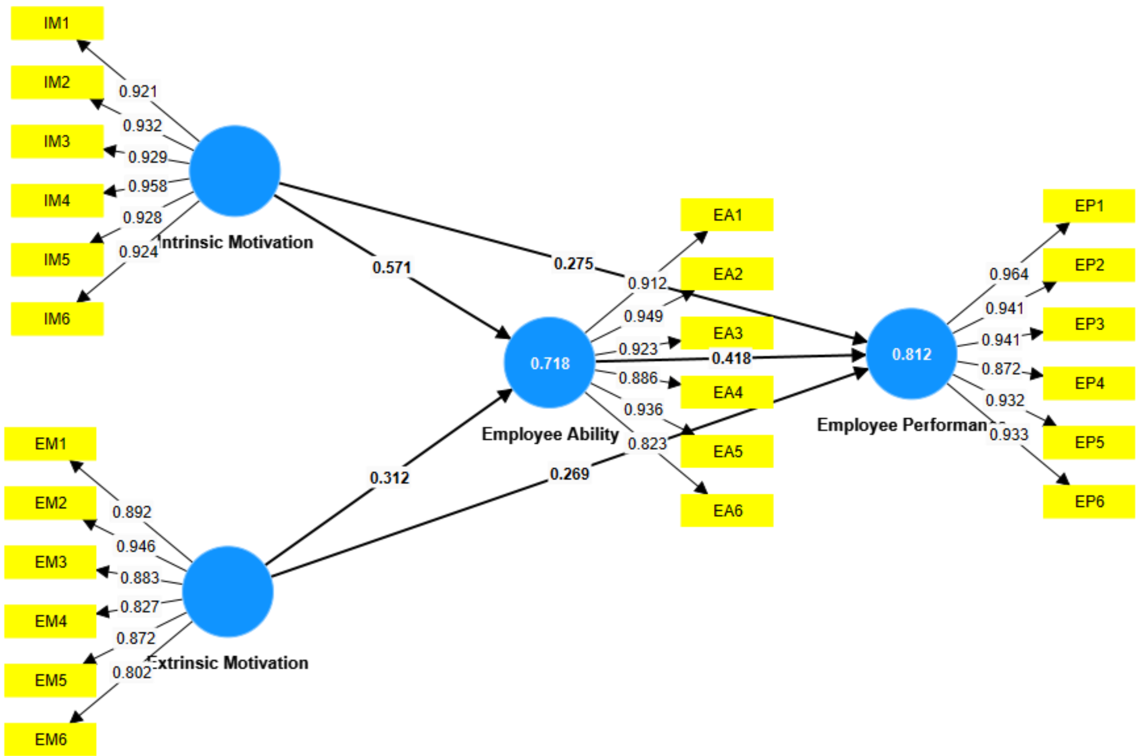

Figure 2. SEM Model Estimation Results
Source: Processed Research Data, 2026

Measurement Model Assessment
Convergent Validity

The assessment of convergent validity was conducted to evaluate whether the measurement indicators consistently represent their respective latent constructs. In this study, convergent validity was examined based on the outer loading values of each indicator and the AVE values obtained from the PLS-SEM measurement model. The results presented in Table 3 indicate that all indicators achieved outer loading values above the recommended threshold of 0.70. The outer loading values ranged from 0.802 to 0.964, demonstrating that each indicator has an adequate contribution in measuring its associated construct. Furthermore, all constructs obtained AVE values exceeding the minimum criterion of 0.50, with values ranging from 0.760 to 0.869. Specifically, intrinsic motivation showed an AVE value of 0.869, indicating that its indicators explain a substantial proportion of variance within the construct. Extrinsic motivation obtained an AVE value of 0.760, while ability and employee performance recorded AVE values of 0.820 and 0.866, respectively. These results confirm that the measurement model meets the requirements of convergent validity, and all indicators were retained for subsequent structural model analysis.

Table 3. Convergent Validity and Reliability Assessment Results

Construct	Indicator	Outer Loading	AVE	Cronbach's Alpha	Composite Reliability
Intrinsic Motivation	IM1	0.921	0.869	0.970	0.976
	IM2	0.932			
	IM3	0.929			
	IM4	0.958			
	IM5	0.928			
	IM6	0.924			
Extrinsic Motivation	EM1	0.892	0.760	0.937	0.951
	EM2	0.946			

Construct	Indicator	Outer Loading	AVE	Cronbach's Alpha	Composite Reliability
	EM3	0.883			
	EM4	0.827			
	EM5	0.872			
	EM6	0.802			
Employee Ability	EA1	0.912	0.820	0.956	0.965
	EA2	0.949			
	EA3	0.923			
	EA4	0.886			
	EA5	0.936			
	EA6	0.823			
Employee Performance	EP1	0.964	0.866	0.968	0.975
	EP2	0.941			
	EP3	0.941			
	EP4	0.872			
	EP5	0.932			
	EP6	0.933			

Source: Processed Research Data, 2026

Discriminant Validity

Discriminant validity was assessed to confirm that each construct in the measurement model represents a distinct concept and demonstrates sufficient empirical differences from other constructs. In this study, discriminant validity was evaluated using three assessment criteria: cross loading analysis, HTMT, and Fornell-Larcker Criterion. The cross loading assessment was conducted by comparing the loading value of each indicator on its intended construct with its loading values on other constructs. The results presented in Table 4 indicate that all indicators have the highest loading values on their respective constructs compared with the cross-loading values on other constructs. For the intrinsic motivation construct, all indicators (IM1–IM6) showed the highest loading values on their respective construct, ranging from 0.921 to 0.958. Similarly, the indicators of extrinsic motivation (EM1–EM6) demonstrated the highest loading values on the intended construct, with values ranging from 0.802 to 0.946. The indicators of employee ability (EA1–EA6) also showed stronger loading values on their respective construct, ranging from 0.823 to 0.949, while employee performance indicators (EP1–EP6) obtained the highest loading values on the employee performance construct, ranging from 0.872 to 0.964. These findings indicate that each indicator has a stronger association with its corresponding latent construct than with other constructs, confirming the discriminant validity of the measurement model.

Table 4. Cross Loading Assessment Results

Indicator	Intrinsic Motivation	Extrinsic Motivation	Employee Ability	Employee Performance
IM1	0.921	0.844	0.800	0.792
IM2	0.932	0.768	0.778	0.812
IM3	0.929	0.759	0.753	0.777
IM4	0.958	0.777	0.804	0.792
IM5	0.928	0.760	0.760	0.787
IM6	0.924	0.723	0.741	0.761

Indicator	Intrinsic Motivation	Extrinsic Motivation	Employee Ability	Employee Performance
EM1	0.685	0.892	0.636	0.710
EM2	0.795	0.946	0.770	0.804
EM3	0.820	0.883	0.742	0.781
EM4	0.741	0.827	0.676	0.689
EM5	0.656	0.872	0.682	0.711
EM6	0.612	0.802	0.575	0.590
EA1	0.743	0.733	0.912	0.814
EA2	0.802	0.783	0.949	0.826
EA3	0.730	0.648	0.923	0.743
EA4	0.781	0.724	0.886	0.780
EA5	0.796	0.766	0.936	0.802
EA6	0.641	0.591	0.823	0.679
EP1	0.829	0.834	0.810	0.964
EP2	0.792	0.724	0.810	0.941
EP3	0.777	0.759	0.822	0.941
EP4	0.716	0.762	0.749	0.872
EP5	0.803	0.809	0.790	0.932
EP6	0.793	0.712	0.802	0.933

Source: Processed Research Data, 2026

The discriminant validity of the measurement model was further examined using the HTMT. This assessment was conducted to evaluate whether the constructs in the model demonstrate sufficient distinction from each other based on their empirical relationships. The HTMT values were compared with the recommended threshold of 0.90, where values below this criterion indicate adequate discriminant validity among constructs.

Table 5. HTMT Assessment Results

Construct	Employee Ability	Employee Performance	Extrinsic Motivation	Intrinsic Motivation
Employee Ability	-	-	-	-
Employee Performance	0.889	-	-	-
Extrinsic Motivation	0.823	0.861	-	-
Intrinsic Motivation	0.859	0.870	0.865	-

Source: Processed Research Data, 2026

Based on Table 5, all HTMT values among the constructs were below the threshold of 0.90. The obtained values ranged from 0.823 to 0.889, indicating that the correlations between different constructs remained within the acceptable range. The highest HTMT value was found between employee ability and employee performance (0.889), while the lowest value was observed between employee ability and extrinsic motivation (0.823). These results confirm that each construct in the measurement model has sufficient discriminant validity, indicating that the constructs measure different empirical concepts within the proposed model.

The discriminant validity was additionally assessed using the Fornell-Larcker Criterion. This criterion evaluates discriminant validity by comparing the square root value of the AVE of each construct with the correlations between constructs. Discriminant validity is considered established when the square root of AVE for each construct is higher than its correlation values with other constructs. The results of the Fornell-Larcker Criterion assessment are presented in Table 6.

Table 6. Fornell-Larcker Criterion Assessment Results

Construct	Employee Ability	Employee Performance	Extrinsic Motivation	Intrinsic Motivation
Employee Ability	0.906	-	-	-
Employee Performance	0.857	0.931	-	-
Extrinsic Motivation	0.785	0.825	0.872	-
Intrinsic Motivation	0.829	0.844	0.829	0.932

Source: Processed Research Data, 2026

Based on Table 6, the square root values of AVE for each construct were higher than the corresponding correlation values with other constructs. The highest diagonal value was obtained by intrinsic motivation (0.932), followed by employee performance (0.931), employee ability (0.906), and extrinsic motivation (0.872). These values exceeded the inter-construct correlation values in their respective rows and columns. Therefore, the Fornell-Larcker Criterion results confirm that all constructs demonstrate adequate discriminant validity. The findings indicate that the measurement model satisfies the required criteria for further structural model evaluation.

Internal Consistency Reliability

The internal consistency reliability assessment was conducted to evaluate the consistency of the indicators used to measure each construct in the measurement model. This assessment was evaluated using Cronbach's Alpha and Composite Reliability values. A construct is considered reliable when both values exceed the recommended threshold of 0.70, indicating satisfactory internal consistency among the measurement indicators. The results of the internal consistency reliability assessment are presented in Table 3. Based on Table 3, all constructs obtained Cronbach's Alpha and Composite Reliability values above the recommended threshold of 0.70. The Cronbach's Alpha values ranged from 0.937 to 0.970, while the Composite Reliability values ranged from 0.951 to 0.976. These results indicate that all indicators demonstrate strong internal consistency in measuring their respective constructs. Therefore, the measurement model meets the required reliability criteria, confirming that all constructs have adequate reliability for further structural model assessment.

Structural Model Assessment

Coefficient of Determination (R^2)

The coefficient of determination (R-Square) was assessed to evaluate the explanatory power of the structural model in predicting the endogenous constructs. The R-Square value indicates the proportion of variance in the endogenous variables that can be explained by the predictor constructs included in the research model. Since R-Square is only applicable to endogenous constructs, no R-Square value is reported for the exogenous constructs. The results of the R-Square assessment are presented in Table 7.

Table 7. Coefficient of Determination (R^2) Results

Construct	R-square
Employee Ability	0.718
Employee Performance	0.812

Source: Processed Research Data, 2026

Based on Table 7, the R^2 value for employee ability is 0.718, indicating that 71.8% of the variance in employee ability can be explained by intrinsic motivation and extrinsic motivation, while the remaining 28.2% is explained by other factors outside the proposed model. Furthermore, the R-Square value for employee performance is 0.812, indicating that 81.2% of the variance in employee performance can be explained by intrinsic motivation, extrinsic motivation, and employee ability. The remaining 18.8% is attributed to other variables that are not included in the research model. These results indicate that the proposed structural model has substantial explanatory capability in explaining the endogenous constructs.

Effect Size (f^2)

The effect size (f^2) assessment was conducted to evaluate the contribution of each exogenous construct in explaining the endogenous constructs within the structural model. The f^2 value indicates the magnitude of the effect of each predictor construct on the endogenous construct when assessing the structural relationships in the model. The effect size values were interpreted based on the recommended criteria, where values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. The results of the f^2 assessment are presented in Table 8.

Table 8. Effect Size (f^2) Results

Construct	Employee Ability	Employee Performance
Extrinsic Motivation	0.088	0.277
Intrinsic Motivation	0.292	0.136
Employee Ability	-	0.453

Source: Processed Research Data, 2026

Based on Table 8, the f^2 values indicate different levels of contribution among the predictor constructs. For employee ability, intrinsic motivation obtained an f^2 value of 0.292, indicating a medium effect, while extrinsic motivation obtained a value of 0.088, representing a small effect. These findings indicate that intrinsic motivation provides a stronger contribution than extrinsic motivation in explaining employee ability. Regarding employee performance, employee ability showed an f^2 value of 0.453, indicating a large effect. Meanwhile, extrinsic motivation obtained an f^2 value of 0.277, indicating a medium effect, and intrinsic motivation obtained an f^2 value of 0.136, indicating a small effect. Overall, the f^2 assessment demonstrates that employee ability has the strongest contribution in explaining employee performance, while intrinsic motivation provides the largest contribution in explaining employee ability within the structural model.

Variance Inflation Factor (VIF)

The collinearity assessment was conducted to examine whether multicollinearity issues exist among the predictor constructs in the structural model. This assessment was evaluated using the VIF values generated from the inner model. A VIF value below the recommended threshold of 5.00 indicates that collinearity is not a critical concern and that the predictor constructs can be reliably used for hypothesis testing. The results of the inner model collinearity assessment are presented in Table 9.

Table 9. VIF Results

Construct	Employee Ability	Employee Performance
Extrinsic Motivation	2.358	2.566
Intrinsic Motivation	2.358	3.048
Employee Ability	-	2.471

Source: Processed Research Data, 2026

Based on Table 9, all VIF values in the structural model were below the threshold of 5.00. The VIF values for the prediction of employee ability from extrinsic motivation and intrinsic motivation were both 2.358. Meanwhile, the VIF values for employee performance ranged from 2.471 to 3.048, with the highest value observed for the relationship involving intrinsic motivation. These results indicate that the predictor constructs do not exhibit problematic collinearity.

Predictive Relevance (Q^2)

The predictive relevance (Q^2) assessment was conducted to evaluate the predictive capability of the structural model for the endogenous constructs. The Q^2 value was obtained using the blindfolding procedure, where a value greater than zero indicates that the model has predictive relevance for the endogenous constructs. The results of the Q^2 assessment are presented in Table 10.

Table 10. Q^2 Results

Construct	SSO	SSE	Q^2 (=1-SSE/SSO)
Employee Ability	744.000	313.285	0.579
Employee Performance	744.000	225.943	0.696

Source: Processed Research Data, 2026

Based on Table 10, the Q^2 values for all endogenous constructs are greater than zero, indicating that the structural model demonstrates predictive relevance. The employee ability construct obtained a Q^2 value of 0.579, while employee performance obtained a Q^2 value of 0.696. These results indicate that the proposed model has adequate predictive capability in explaining the endogenous constructs. Furthermore, employee performance demonstrates a higher predictive relevance value compared with employee ability, indicating that the model provides stronger predictive accuracy for explaining variations in employee performance.

Standardized Root Mean Square Residual (SRMR)

The model fit assessment was conducted to evaluate the compatibility between the proposed model and the empirical data. In this study, the SRMR value was used as an indicator of model fit. An SRMR value below the recommended threshold of 0.08 indicates an acceptable model fit. The analysis results showed that the SRMR value for both the saturated model and the estimated model was 0.066. This value indicates that the proposed model has an acceptable level of fit, as it remains below the recommended threshold. Therefore, the structural model demonstrates an adequate representation of the empirical data and can be further evaluated for hypothesis testing.

Hypothesis Testing Results

The hypothesis testing results were evaluated based on the path coefficient (β), t-statistic, and p-value obtained from the PLS-SEM bootstrapping procedure. A hypothesis is supported when the p-value is below 0.05, indicating that the proposed structural relationship is statistically significant.

Table 11. Direct Effect Hypothesis Testing

Hypothesis	Structural Relationship	β	t-statistic	p-value	Decision
H1	Intrinsic Motivation → Employee Performance	0.275	3.360	0.001	Supported
H2	Extrinsic Motivation → Employee Performance	0.269	3.183	0.001	Supported
H3	Employee Ability → Employee Performance	0.418	4.156	0.000	Supported
H4	Intrinsic Motivation → Employee Ability	0.571	5.286	0.000	Supported
H5	Extrinsic Motivation → Employee Ability	0.312	2.907	0.004	Supported

Source: Processed Research Data, 2026

The direct-effect analysis was conducted to examine the effect of intrinsic motivation and extrinsic motivation on employee ability and employee performance, as well as the effect of employee ability on employee performance. The results of the direct-effect hypothesis testing are presented in Table 11. Table 11 shows that all direct-effect hypotheses (H1–H5) were supported, indicating that intrinsic motivation and extrinsic motivation significantly affected employee ability and employee performance, while employee ability also significantly affected employee performance, confirming the proposed direct structural relationships within the research model.

The mediating role of employee ability was examined through specific indirect effects using the bootstrapping procedure. The mediation analysis evaluated whether employee ability mediated the relationships between intrinsic motivation and extrinsic motivation with employee performance. The results of the mediation analysis are presented in Table 12. Table 12 indicates that all mediation hypotheses (H6–H7) were supported. Employee ability partially mediated the relationships between intrinsic motivation and extrinsic motivation with employee performance, as both the direct and indirect effects remained significant.

Table 12. Indirect Effect Hypothesis Testing

Hypothesis	Indirect Relationship	β	t-statistic	p-value	Decision	Mediation
H6	Intrinsic Motivation → Employee Ability → Employee Performance	0.238	3.308	0.001	Supported	Partial
H7	Extrinsic Motivation → Employee Ability → Employee Performance	0.130	2.326	0.020	Supported	Partial

Source: Processed Research Data, 2026

Discussion

The Effect of Intrinsic Motivation on Employee Performance

The findings confirm that intrinsic motivation contributes positively to employee performance. This result indicates that employees who experience enjoyment, satisfaction, achievement, responsibility, and opportunities for personal growth tend to demonstrate better work outcomes. In the context of PG Gempolkrep, intrinsic motivation represents an internal psychological resource that encourages employees to complete their responsibilities with greater commitment and involvement. This finding is consistent with Self-Determination Theory, which explains that individuals with autonomous motivation are more likely to demonstrate persistent behavior because their work activities are aligned with personal values and internal satisfaction (Ryan & Deci, 2020). Employees who perceive their work as meaningful are more likely to invest greater effort, maintain responsibility, and continuously improve their performance. Previous research has also demonstrated that autonomous motivation contributes to positive employee outcomes, including engagement, proactive behavior, and effectiveness at work (Gagné et al., 2022). The result further supports previous studies emphasizing that intrinsic motivation is an important determinant of employee performance (Kuvaas et al., 2021). However, this study extends previous research by demonstrating the relevance of intrinsic motivation in the sugar manufacturing industry context, where employees are required to maintain operational effectiveness and adapt to continuous production demands. Therefore, strengthening employees' internal motivation through meaningful work, recognition of achievement, and opportunities for self-development can become an important strategy for improving employee performance.

The Effect of Extrinsic Motivation on Employee Performance

The findings demonstrate that extrinsic motivation influences employee performance. This result suggests that external motivational factors, such as rewards, recognition, career opportunities, organizational support, and incentives, encourage employees to increase their work contribution and achieve organizational targets. This finding supports the argument of Ryan and Deci (2020), which explains that extrinsic motivation can produce positive behavioral outcomes when external factors are perceived as supportive and meaningful rather than merely controlling. In organizational settings, appropriate reward systems and recognition practices may strengthen employees' willingness to perform because employees perceive that their efforts are valued by the organization. The result is also in line with previous research showing that extrinsic motivational factors contribute to employee outcomes by strengthening work commitment and goal-oriented behavior (Gagné et al., 2022). Kuvaas et al. (2021) further emphasized that external motivational mechanisms may influence employee performance, although their effectiveness depends on how employees perceive and internalize these external factors. The findings of this study contribute by confirming that extrinsic motivation remains relevant in explaining employee performance within a manufacturing organization, particularly in an environment where employees are required to achieve operational targets consistently.

The Effect of Employee Ability on Employee Performance

The findings indicate that employee ability is an important determinant of employee performance. This result demonstrates that employees' knowledge, skills, experience, problem-solving capability, and adaptability enable them to complete work responsibilities more effectively. This finding supports the motivation–ability perspective, which explains that performance depends on both employees' willingness to perform and their capability to execute tasks effectively (Appelbaum et al., 2000). Motivation alone may not be sufficient to achieve optimal performance when employees lack the necessary competencies to handle job demands. Therefore, employee ability represents a fundamental resource that allows employees to transform their effort into measurable work outcomes. Previous studies have emphasized that employee ability contributes to performance because employees with stronger competencies are better able to utilize their knowledge and skills in completing organizational tasks (Alqudah et al., 2022; Bos-Nehles et al., 2023). Hidayat et al. (2024) also highlighted that employee capability supports effectiveness and productivity by enabling employees to respond to workplace challenges. The findings of this study reinforce these arguments by showing that developing employee ability is essential for organizations seeking sustainable performance improvement.

The Effect of Intrinsic Motivation on Employee Ability

The findings reveal that intrinsic motivation contributes to the development of employee ability. This result suggests that employees who possess internal motivation are more likely to improve their knowledge, skills, and competence because they view learning and personal development as valuable aspects of their work experience. This finding is consistent with Self-Determination Theory, which emphasizes that intrinsic motivation encourages individuals to pursue competence and continuous improvement (Ryan & Deci, 2020). Employees who are motivated by achievement and personal growth tend to actively seek opportunities to enhance their capabilities, rather than simply completing tasks based on organizational requirements. Previous research supports this relationship by demonstrating that intrinsic motivation encourages proactive behavior, learning orientation, and individual development (Afsar et al., 2021; Gagné et al., 2022). While previous studies have often positioned employee ability as a predictor of performance, this study provides additional insight by showing that employee ability can also be strengthened through motivational processes. Thus, intrinsic motivation represents not only a driver of performance but also a foundation for employee capability development.

The Effect of Extrinsic Motivation on Employee Ability

The findings demonstrate that extrinsic motivation contributes to employee ability development. This result indicates that organizational support, recognition, rewards, and career-related opportunities can encourage employees to improve their competencies and enhance their capacity to perform work tasks. This finding supports the AMO framework, which explains that organizational practices influence employee outcomes through the development of ability and motivation (Appelbaum et al., 2000). External motivational mechanisms may encourage employees to participate in training, acquire new knowledge, and develop skills required for achieving organizational objectives. The result is consistent with previous research indicating that human resource practices, including supportive systems and development opportunities, contribute to employee growth and capability improvement (Boon et al., 2021; Kooij et al., 2021). However, the findings also suggest that external motivation functions as a supporting mechanism rather than the only source of employee development. Employees are more likely to strengthen their abilities when external encouragement is combined with personal willingness to improve.

The Mediating Role of Employee Ability in the Effect of Intrinsic Motivation on Employee Performance

The findings confirm that employee ability mediates the relationship between intrinsic motivation and employee performance. This result demonstrates that intrinsic motivation improves performance through two mechanisms: encouraging employees to perform their responsibilities and stimulating the development of work-related capabilities. This finding provides support for the integration of Self-Determination Theory and the motivation–ability perspective. Intrinsic motivation explains employees' willingness to engage in work activities, while employee ability explains how that willingness is transformed into effective performance outcomes. Employees who are internally motivated are more likely to develop their competencies, which subsequently enables them to achieve better work results. Previous studies have demonstrated that intrinsic motivation encourages proactive behavior, learning, and individual development, which contribute to improved work outcomes (Afsar et al., 2021). Saks (2022) further emphasized that psychological factors influence employee performance through behavioral and capability-related mechanisms. Therefore, this study extends previous research by identifying employee ability as an important pathway that explains how intrinsic motivation translates into employee performance.

The Mediating Role of Employee Ability in the Effect of Extrinsic Motivation on Employee Performance

The findings also confirm that employee ability mediates the relationship between extrinsic motivation and employee performance. This result indicates that external motivational factors influence performance not only by increasing employees' effort but also by encouraging the development of capabilities required to perform effectively. This finding supports the AMO framework, which emphasizes that employee outcomes emerge from the interaction between ability and motivation (Appelbaum et al., 2000). External rewards, recognition, and organizational support can motivate employees to improve their competencies, while enhanced abilities enable employees to convert motivation into improved performance. Previous research has highlighted that HRM practices influence employee outcomes through ability and motivation mechanisms (Boon et al., 2021; Bos-Nehles et al., 2023). The findings of this study extend this perspective by demonstrating that employee ability serves as an intermediate mechanism linking extrinsic motivation with performance outcomes. Therefore, organizations should integrate motivational practices with employee development initiatives to achieve sustainable performance improvement.

CONCLUSION

This study concludes that employee performance in the sugar manufacturing context is influenced by motivational and capability-related factors. The findings demonstrate that both intrinsic motivation and extrinsic motivation contribute to improving employee performance. Employees who possess strong internal motivation through work enjoyment, achievement, responsibility, and personal growth tend to demonstrate better performance outcomes. Similarly, external motivational factors, including rewards, recognition, organizational support, and career opportunities, also encourage employees to increase their work contribution. Furthermore, this study confirms that employee ability represents an important factor in achieving effective employee performance. Employees who possess adequate knowledge, skills, experience, problem-solving capability, and adaptability are better able to transform their motivation into effective work outcomes. The findings also highlight that employee ability functions as an important mechanism linking motivational factors with performance outcomes. Intrinsic and extrinsic motivation not only directly influence employee performance but also contribute to performance improvement through the development of employee capability. Overall, this study provides evidence that sustainable employee performance improvement requires an integrated approach that combines motivational enhancement and employee capability development. The findings extend previous research by demonstrating the importance of considering employee ability as a mechanism that explains how motivation is translated into performance within the manufacturing industry context. Based on the findings, organizations are encouraged to develop human resource management practices that simultaneously strengthen employee motivation and ability. Management should create a work environment that supports intrinsic motivation by providing meaningful work experiences, opportunities for personal development, and greater involvement in achieving organizational goals. In addition, extrinsic motivational practices such as recognition, rewards, and career development opportunities should be maintained to encourage employee commitment and contribution. Organizations should also prioritize continuous employee capability development through training programs, competency improvement initiatives, and opportunities for knowledge and skill enhancement. Strengthening employee ability is important because motivation can produce optimal performance when employees possess the necessary capabilities to complete their responsibilities effectively. For future research, further studies may expand the proposed model by incorporating other organizational and individual factors that may influence employee performance. Future researchers may also examine the model in different industrial contexts or compare organizations with different characteristics to provide broader understanding regarding the relationship between motivation, employee ability, and performance outcomes.

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