

The Mediating Role of Employee Engagement in Explaining the Phenomenon of Performance Stagnation: A Study on the Effectiveness of Training and Development in the Forestry Industry (PT SBA Wood Industries)

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ABSTRACT

Although PT Sebangun Bumi Andalas Wood Industries (PT SBA WI) invested heavily in training, reaching 86.3 percent of its workforce in 2023, the firm continued to experience flat employee performance. For two successive years, most staff stayed within the average performance band, while the level of work engagement had not yet met the target set by management. Such a pattern points to a mediating mechanism that remains empirically unclarified in the forestry sector. The present research therefore investigates how the effectiveness of training and development shapes work engagement and performance, and whether engagement carries the influence of training onto performance at PT SBA WI. Drawing on Social Exchange Theory (SET) together with Job Demands Resources (JD-R) Theory, the study adopts a quantitative and causal design. Responses were gathered from 224 staff members selected through proportionate stratified random sampling using a questionnaire scored on a Likert scale, and the data were processed with Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4.0. The estimates reveal that training effectiveness raises work engagement ($\beta = 0.740$; $p = 0.000$) and that engagement in turn lifts performance ($\beta = 0.859$; $p = 0.000$), whereas training shows no significant direct link to performance ($\beta = 0.029$; $p = 0.693$). Because the indirect path is significant (0.636 ; $p = 0.000$) while the direct path is not, engagement operates as a full mediator. The evidence indicates that spending on training does not raise performance by itself unless the firm first cultivates a strong sense of engagement among its people.

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1. INTRODUCTION

Within the Industry 4.0 setting, the ambition of firms to stay competitive, lift their results, and secure durable success has pushed them to forge collaborative ties with every stakeholder [1]. The workforce constitutes a decisive asset whose condition feeds directly into a firm's financial outcomes and its valuation in the market. Reaching organizational targets in turbulent and intricate settings depends heavily on staff who stay committed, content, and loyal over time. Even so, holding on to such people and spurring them toward strong results continues to test almost every organization.

PT Sebangun Bumi Andalas Wood Industries (PT SBA WI), a private firm in the Industrial Plantation Forest or HTI sector, runs its operations in Ogan Komering Ilir Regency in the province of South Sumatra. Because HTI concessions stretch across wide and scattered terrain, every worker has to take charge of a designated area and settle field issues without close supervision, a situation that makes forestry personnel a worthwhile subject for study. Yet, in spite of considerable spending on developing its people, the company has registered a stall in performance.

Appraisal records reveal that high performers, namely those rated A plus and A, made up 14.74 percent of staff in 2023, while the bulk of employees sat at rating B (70.74 percent) and the remainder fell into ratings C and D at 7.58 percent and 6.95 percent. The following year produced almost the same picture, with high performers nudging up to 14.81 percent, rating B reaching 70.79 percent, and ratings C and D standing at 7.30 percent and 7.10 percent. The spread of performance, in short, hardly moved, showing neither a larger share of top performers nor a smaller share of weak ones, despite yearly training for most staff. Productivity figures based on Mean Annual Increment (MAI) for 2023 through 2025 reinforce the picture, since realized output for every species and land category stayed under target and climbed only slightly each year.

On the investment side, PT SBA WI has opened training to most of its staff. Company records show participation of 86.3 percent in 2023, 83.4 percent in 2024, and 78.8 percent by October 2025, figures that sit comfortably above many international references, which put yearly training reach near 60 percent [2]. Curiously, this heavy commitment to training has not produced better performance. Work engagement, in parallel, has stayed short of the desired level. An in house survey covering vigor, dedication, and absorption returned mean scores of 3.50, or 70.0 percent of the ceiling, for vigor, 3.86 (77.2 percent) for dedication, and 3.66 (73.2 percent) for absorption, giving an overall figure of about 73 to 74 percent and leaving a clear gap below the firm's aim of 85 percent.

Under the logic of Social Exchange Theory (SET), the resources a firm devotes to training and development ought to lift not only competence but also the contribution employees make to results. When results refuse to move, however, the obstacle may rest not with competence as such but with the readiness to give full effort, that is engagement and commitment, when putting training into practice. For this reason engagement is treated here as the essential connector between training effectiveness and performance [3], and earlier work has repeatedly shown engagement to carry the link from training and development to performance.

The gap this study confronts is accordingly more than a matter of an unfamiliar forestry setting; it is an empirical puzzle calling for explanation, namely why heavy training spending fails on its own to translate into stronger performance. Engagement is introduced as the mediating variable to test whether training merely sharpens the ability side, that is competence, while falling short of arousing the willingness side, that is engagement or commitment, that allows training to be applied and to register in performance. The study therefore sets out to portray the standing of training effectiveness, engagement, and performance at PT SBA WI; to gauge the bearing of training effectiveness

on engagement; to gauge the bearing of engagement on performance; to gauge the direct bearing of training effectiveness on performance; and to assess engagement as a mediator within that chain.

2. LITERATURE REVIEW

2.1 *Effectiveness of Training and Development*

Training and development denotes a planned organizational endeavor to raise the capability, skill, and effectiveness of staff for both present duties and future requirements [4]. Programs that work well sharpen technical as well as behavioral competence, deepen the sense that the organization lends its support, and ease adjustment to shifting tasks and emerging technology. Effectiveness here is captured through eight facets, namely strategic purpose and benefit, the calibre of trainers, scheduling and administration, the quality of materials, the usefulness of the training, the mode of delivery, the transfer of learning, and the readiness of participants.

2.2 *Employee Engagement*

For Schaufeli and Bakker, work engagement is an affirmative and rewarding frame of mind toward one's work, expressed through three facets, namely vigor, which is energy and stamina at work, dedication, which is a feeling of meaning, pride, and inspiration, and absorption, which is deep concentration and contented immersion in the task. People who are engaged pour their energy and focus into their duties and feel a strong pull to take part. A body of studies has tied engagement to better performance, marking it as a strategic lever for lasting improvement and a key to understanding why performance differs from one person to another.

2.3 *Employee Performance*

Employee performance concerns the standard and the volume of work an individual delivers while discharging assigned responsibilities [5]. The present

study appraises it through markers of work quality, work quantity, and timeliness, which capture accuracy, the meeting of targets, and respect for deadlines and schedules.

2.4 *Theoretical Framework and Hypotheses*

Two mutually reinforcing theories anchor the study. Social Exchange Theory (SET) holds that staff repay organizational support, training among its forms, with warmer attitudes and stronger conduct at work [3]. Job Demands Resources (JD-R) Theory casts engagement as an upbeat motivational condition, fed by job resources, that prompts employees to commit their energy and thereby reach higher performance [6]. From these premises and the surrounding evidence, the study advances four hypotheses:

H1: Training and development effectiveness exerts a positive and significant influence on employee engagement.

H2: Employee engagement exerts a positive and significant influence on employee performance.

H3: Training and development effectiveness exerts a positive and significant direct influence on employee performance.

H4: Employee engagement mediates the link between training and development effectiveness and employee performance.

3. METHODS

The inquiry follows a quantitative and causal, that is explanatory, design rooted in the positivist tradition, with the aim of testing propositions about cause and effect among the variables so as to account for the performance stall at PT SBA WI. Training and development effectiveness serves as the exogenous variable (X), engagement as the mediator (Z), and performance as the endogenous variable (Y).

The study population consisted of PT SBA WI staff. Using proportionate stratified random sampling, a final set of 224 participants was obtained, each meeting the entry conditions of being a permanent

employee with at least one year of service who had taken part in company training or development. A questionnaire built on a five point Likert scale, running from 1 for strong disagreement to 5 for strong agreement, supplied the primary data, complemented by open interviews with the Head of the HRGA Department and by a review of company documents.

Content validity rested on the judgement of experts, while empirical validity drew on outer loading values of no less than 0.70; reliability relied on Cronbach Alpha and Composite Reliability, again with a floor of 0.70. Estimation proceeded through Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4.0. Assessment of the measurement, or outer, model took in convergent validity, discriminant validity via HTMT and the Fornell and Larcker test, and construct reliability, whereas the structural, or inner, model was examined through collinearity (VIF), the determination coefficient (R^2), effect size (f^2), predictive relevance (Q^2), model fit (SRMR), and hypothesis testing by means of bootstrapping over 5,000 subsamples.

4. RESULTS AND DISCUSSION

4.1 Respondent Profile and Descriptive Analysis

Among the 224 participants, most (90.6 percent) fell in the 18 to 28 age band, signalling a largely youthful and early career group; 92.9 percent held a Bachelor or D4 qualification; and 90.6 percent worked as officers or supervisors, in keeping with a company structure weighted toward operational roles. The respondents came from a range of forestry units, chiefly Plantation (33.0 percent) and Nursery (14.3 percent). On a descriptive reading, all three constructs landed in the very good band according to respondent perception, with training effectiveness, engagement, and performance each surpassing 84 percent of the ideal score, even as the firm's objective records exposed the very stagnation that prompted the study.

4.2 Measurement Model (Outer Model)

Every indicator cleared the bar for convergent validity, posting outer loadings beyond 0.70 and AVE figures beyond 0.50. Table 1 shows that the constructs were highly dependable, since their Cronbach Alpha and Composite Reliability values comfortably topped the 0.70 mark, a sign of solid internal consistency.

Table 1. Reliability and Convergent Validity of Constructs

Construct	Cronbach Alpha	CR (rho_c)	AVE	Result
Training and Development (X)	0.974	0.976	0.672	Reliable and Valid
Employee Engagement (Z)	0.948	0.955	0.590	Reliable and Valid
Employee Performance (Y)	0.950	0.958	0.743	Reliable and Valid

Source: SmartPLS 4.0 output, processed (2026)

Discriminant validity drew on the Heterotrait Monotrait ratio (HTMT) alongside the Fornell and Larcker test, as Table 2 reports. The X with Y and X with Z pairings cleared the 0.90 HTMT bar. The Z with Y pairing returned an HTMT of 0.926, yet its bootstrapped interval of [0.886; 0.958] stopped short of 1.0, which

marks the two constructs as statistically separate. The elevated figure mirrors the close and direct predictive tie between engagement, a state of mind, and performance, a behavioral result, inside the JD-R scheme, rather than any overlap of constructs.

Table 2. Discriminant Validity Results (HTMT and Fornell and Larcker)

Construct Pair	HTMT	Fornell and Larcker ($\sqrt{AVE}$)	Result
Y (Performance) with X (T and D)	0.683	0.665 < 0.820	Valid
Z (Engagement) with X (T and D)	0.765	0.740 < 0.820	Valid
Z (Engagement) with Y (Performance)	0.926	CI [0.886; 0.958]	Valid (HTMT CI)

Source: SmartPLS 4.0 output, processed (2026)

4.3 Structural Model (Inner Model)

Tests for collinearity yielded inner model VIF values of 1.000 on the X to Z path and 2.214 on the X to Y and Z to Y paths, comfortably under the strict 3.3 limit and so free of multicollinearity. Per Table 3, the model accounted for a sizeable slice of variance in the endogenous constructs, recording R^2 of

0.769 (substantial) for performance (Y) and 0.548 (moderate) for engagement (Z). Effect sizes (f^2) along X to Z (1.215) and Z to Y (1.411) were very large, while the direct X to Y path carried a trivial f^2 of 0.002. Predictive relevance ($Q^2_{predict}$) reached 0.539 for Z and 0.429 for Y, both above zero, and an SRMR of 0.055, under the 0.08 ceiling, signalled a sound fit.

Table 3. Determination Coefficient (R^2) and Predictive Relevance (Q^2)

Endogenous Variable	R^2	$Q^2_{predict}$	Category
Employee Engagement (Z)	0.548	0.539	Moderate
Employee Performance (Y)	0.769	0.429	Substantial

Source: SmartPLS 4.0 output, processed (2026)

Table 4 condenses the hypothesis tests run with 5,000 bootstrap subsamples, where a hypothesis stands

when the T statistic clears 1.96 and the p value falls under 0.05.

Table 4. Path Coefficients and Results of Hypothesis Testing

Path	β	T Stat	P Value	f^2	Decision
H1: T and D (X) to Engagement (Z)	0.740	17.921	0.000	1.215	Accepted
H2: Engagement (Z) to Performance (Y)	0.859	14.270	0.000	1.411	Accepted
H3: T and D (X) to Performance (Y) direct	0.029	0.395	0.693	0.002	Rejected
H4: X to Z to Y (indirect)	0.636	10.962	0.000	–	Accepted

Source: SmartPLS 4.0 output, processed (2026)

The mediation check showed the indirect route from X to Y by way of Z to be significant ($\beta = 0.636$; $p = 0.000$), with a bias corrected 95 percent interval of [0.529; 0.752] that excluded zero, whereas the direct route from X to Y was not significant ($\beta = 0.029$; $p = 0.693$; interval [-0.108; 0.175]). By the standards of Hair et al. [7], this pattern signals full mediation, meaning engagement wholly conveys the effect of training effectiveness onto performance. A total effect of X on Y of 0.665 ($p = 0.000$) confirms that training and development still adds substantially to performance, though entirely by way of the engagement route.

4.4 Discussion

Support for H1 ($\beta = 0.740$; $f^2 = 1.215$) confirms that stronger training programs at PT SBA WI go hand in hand with higher engagement. The result sits well with Social Exchange Theory, for staff who receive effective training read it as a token of investment in their growth and answer with deeper engagement on emotional, cognitive, and behavioral fronts [3]. It echoes earlier findings that training and development markedly boosts engagement [8], and it adds fresh evidence from the seldom examined HTI forestry context, where capable training still forges strong engagement even

when the workforce is spread across distant sites.

Support for H2 ($\beta = 0.859$; $f^2 = 1.411$, the heaviest path in the model) establishes engagement as the foremost driver of performance, in line with JD-R Theory holding that engagement, an upbeat motivational state, leads people to spend their energy fully and lift their output [6]. The rejection of H3 ($\beta = 0.029$; $p = 0.693$), by contrast, shows that training does not raise performance on its own absent the mediating action of engagement, since training builds capability but cannot, unaided, sharpen performance.

Taken together, the backing for H4 and the dismissal of H3 point to full mediation. Therein lies the study's core message, that training spending fails to lift performance unless engagement is first secured. This account makes sense of the paradox at PT SBA WI, where broad training coverage coincided with flat performance, the missing piece being the willingness facet of engagement, above all the absorption component, which scored lowest among the engagement facets.

5. CONCLUSION

The study finds that training and development effectiveness positively and significantly raises engagement, that

engagement in turn positively and significantly raises performance, and that training carries no significant direct effect on performance, so that engagement fully mediates the path from training effectiveness to performance at PT SBA WI. Though all three constructs draw very favorable perceptions, the objective stagnation endures because training spending does not turn into performance until a firm sense of engagement is first nurtured. The firm is thus advised to pair its training with engagement building measures, among them coaching after training, duties built around freshly gained competencies, and recognition of accomplishment, while giving special care to the absorption facet through richer job design and wider autonomy. Subsequent studies might fold in moderators such as transformational leadership and perceived organizational support, widen the sample to other forestry and resource based manufacturing settings, and bring in objective performance records to curb the bias of self reported data.

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