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The role of teacher empowerment and reward systems in enhancing engagement through professional commitment

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Abstract. This study examines the influence of teacher empowerment and rewards on teacher engagement through professional commitment. The research is motivated by the relatively low level of teacher engagement influenced by managerial and motivational factors within educational institutions. The objective is to analyze both direct and indirect effects of empowerment and reward systems on teacher engagement, with professional commitment serving as a mediating variable. A quantitative approach was employed using Structural Equation Modeling–Partial Least Squares (SEM-PLS). The respondents were secondary school teachers selected through purposive sampling. Data were collected through a structured questionnaire using a five-point Likert scale. The research instrument measured four constructs: teacher empowerment (autonomy, participation in decision-making, access to resources), reward (financial and non-financial compensation), professional commitment (dedication, loyalty, responsibility), and teacher engagement (vigor, dedication, absorption). Validity was assessed through convergent and discriminant validity, while reliability was tested using Cronbach's alpha and composite reliability. The findings indicate that teacher empowerment has a positive and significant effect on professional commitment and teacher engagement. Rewards demonstrate a positive but relatively weak effect on engagement. Professional commitment significantly mediates the relationship between empowerment and teacher engagement.

Introduction

Education is a key foundation for developing qualified human resources, and teachers play a central role in shaping the quality of learning through their competence and teaching strategies. Ideally, teachers demonstrate high levels of engagement characterized by vigor, dedication, and absorption in their professional duties (Widana et al., 2023). High teacher engagement contributes significantly to instructional effectiveness, student achievement, and institutional sustainability. Recent studies confirm that supportive managerial practices, empowerment, and fair reward systems positively influence teacher engagement and professional commitment (McConnell & Swanson, 2024; Prasetia & Akrim, 2024; Wang et al., 2022).

However, increasing workloads, including administrative tasks, additional duties, and time pressures, can trigger stress and emotional fatigue (Mohzana et al., 2022). Without adequate managerial support, these conditions reduce motivation and teaching performance (Lenawati et al., 2026; Purnadewi et al., 2026). Human resource management initiatives such as professional

development, training, supportive leadership, and work-life balance programs have been shown to promote teacher engagement (Olaivar & Loayon, 2022). Nevertheless, low teacher engagement remains reported in many educational settings, characterized by declining emotional involvement and a higher risk of burnout and turnover intentions (Wang et al., 2022).

Limited empowerment in decision-making and weak reward systems further contribute to lower morale. Recognition, incentives, and promotion opportunities are significant motivational drivers (Lim, 2021; Widana et al., 2019). Reward systems, both financial and non-financial, serve as external incentives that enhance performance when implemented fairly and transparently. Similarly, teacher empowerment through trust, autonomy, and involvement in school decisions fosters responsibility and initiative. Empowered teachers demonstrate stronger professional commitment and reduced burnout (McConnell & Swanson, 2024; Prasetia & Akrim, 2024).

Empirical data reinforce this concern. According to the February 2023 National Labor Force Survey (Sakernas), unemployed vocational high school graduates reached 1.6 million, representing 20% of total unemployment (8 million). This reflects challenges in the quality of vocational education and in the alignment of link-and-match with industry needs. Weak teacher engagement may indirectly contribute to suboptimal graduate competencies. A preliminary survey conducted in January 2024 involving 30 permanent foundation teachers across four private vocational high schools in North Jakarta revealed moderate to low engagement levels. Teachers reported limited career direction, insufficient autonomy, and minimal involvement in decision-making. These findings indicate the need for strategic management interventions.

This study employs the POP-SDM (Modeling and Optimization of Management Resources) method, combined with the SITOREM approach, to identify the dominant variables influencing teacher engagement. The research integrates teacher empowerment, reward effectiveness, Tut Wuri Handayani's leadership, professional commitment, and organizational culture into a comprehensive optimization model. This study offers novelty by combining empowerment, reward systems, leadership values rooted in Tut Wuri Handayani, and professional commitment within an optimization modeling framework (POP-SDM and SITOREM). Previous studies examined these variables separately, whereas this research develops an integrated optimization model tailored to private vocational high schools.

Based on the description above, the research questions can be formulated as follows: (1) How do teacher empowerment and reward effectiveness influence teacher engagement? (2) Does professional commitment mediate these relationships? (3) Which variables exert the most dominant influence in optimizing teacher engagement? In line with the research questions, the hypothesis formulation is as follows: (1) Teacher empowerment positively and significantly affects teacher engagement, (2) Reward effectiveness positively and significantly affects teacher engagement, (3) Professional commitment mediates the relationship between empowerment and engagement, and (4) Professional commitment mediates the relationship between reward effectiveness and engagement. This study aims to analyze direct and indirect effects of empowerment and reward effectiveness on teacher engagement, examine the mediating role of professional commitment, and develop an optimized engagement model using POP-SDM and SITOREM approaches.

Method

Research Type and Approach

This study uses a quantitative, explanatory research method to test hypotheses and explain causal relationships between variables. The research was conducted in 10 private vocational high

schools (SMKs) in North Jakarta, Indonesia. The study was implemented during the 2024 academic year, beginning with instrument development, followed by data collection in the first semester of 2024, and concluding with data analysis and model testing in the subsequent months. The research involved several key stakeholders. The principals and vice principals participated as qualitative informants during the exploratory stage to provide contextual information regarding managerial practices, empowerment policies, and reward mechanisms implemented in their respective schools. Teachers served as the primary respondents in the quantitative phase by completing structured questionnaires. The researchers were responsible for designing the research instruments, conducting expert validation, managing data collection, performing statistical analysis using SEM-PLS with SmartPLS 3.0 software, and interpreting the results. A preliminary qualitative exploration was conducted in the same schools to identify dominant variables influencing teacher engagement. Subsequently, the quantitative approach was employed to objectively assess the impact of teacher empowerment and reward systems on teacher engagement, with professional commitment as a mediating variable. Structural Equation Modeling Partial Least Squares (SEM-PLS) was selected because it enables simultaneous analysis of the measurement model (outer model) and structural model (inner model) and is appropriate for medium sample sizes and complex models.

Research Location and Timeframe

This research is conducted at educational institutions in Indonesia involving teachers as active respondents. The research timeframe includes the stages from instrument development to data collection and result analysis, and is conducted during the academic year (data collection is scheduled according to the research timeline set by the author).

Population and Sample

The population consisted of all teachers working in private vocational high schools in North Jakarta. The sample was selected using purposive sampling, focusing on teachers with at least 2 years of experience, those directly involved in teaching and learning activities, and those who had participated in professional development programs or performance evaluations. The final sample size met the minimum SEM-PLS requirement of five to ten times the number of measured indicators, ensuring statistical adequacy for model estimation.

Research Variables and Operational Definitions

Teacher Empowerment (X_1) in this study refers to the extent to which teachers are provided with autonomy, trust, authority, and organizational support in carrying out their professional responsibilities. Empowerment reflects the degree to which teachers are involved in decision-making processes and are given opportunities to contribute to school development. This variable is operationally measured through several indicators. Delegation of authority refers to the level of responsibility and decision-making authority entrusted to teachers in academic and administrative matters. Supervision refers to the guidance and constructive monitoring provided by school leaders to improve teachers' performance. Organizational support indicates the extent to which the school provides adequate facilities, resources, and moral encouragement to help teachers perform their duties. Self-confidence is teachers' belief in their ability to complete tasks effectively and professionally. Communication reflects the openness, clarity, and effectiveness of interactions between teachers and school management. Collectively, these indicators demonstrate how empowerment practices can strengthen teachers' sense of value and professional capacity within the institution.

The Effectiveness of Reward Systems (X_2) represents teachers' perceptions of how fair, appropriate, and motivating the school's reward mechanisms are. A reward system is considered effective when it not only provides financial compensation but also fosters motivation and

satisfaction. This variable is measured using several indicators. Salary adequacy refers to teachers' perceptions of whether their income is sufficient and proportional to their workload and responsibilities. Impact on job performance measures the extent to which rewards encourage teachers to improve their productivity and teaching quality. A comfortable work environment reflects the physical and psychological conditions that make teachers feel secure and valued at work. Social recognition refers to appreciation, acknowledgment, and respect given to teachers for their achievements and contributions. Organizational fairness refers to whether reward distribution is transparent and equitable (Yasa et al., 2023). Together, these indicators describe how reward systems influence teachers' motivation and attitudes toward their work.

Professional Commitment (Z) reflects the degree to which teachers are loyal, dedicated, and emotionally attached to their profession as educators (Daniati et al., 2026). It describes the internal drive that encourages teachers to consistently perform their duties responsibly and ethically. This variable is operationalized through several indicators. Commitment to tasks refers to teachers' seriousness and responsibility in completing assigned duties. Motivation to contribute is the internal willingness to give one's best efforts to advance students and the institution (Siregar & Amir, 2025). Involvement in service indicates active participation in professional and school-related activities beyond basic teaching responsibilities. Innovation reflects teachers' creativity and initiative in developing new teaching strategies or learning methods. Devotion to the profession describes teachers' pride and sense of calling in their careers. Adherence to work standards refers to compliance with professional ethics and educational regulations. These indicators collectively demonstrate the strength of teachers' professional dedication.

Teacher Engagement (Y) refers to the level of teachers' psychological attachment, enthusiasm, and involvement in their work. Engagement reflects how deeply teachers identify with their roles and how energetically they perform their responsibilities. This variable is measured through several indicators. Career development refers to teachers' opportunities and motivation for professional growth. Ownership describes the sense of belonging and responsibility toward the school and its goals. Loyalty reflects teachers' commitment to remain and contribute positively to the institution. Vigor indicates high levels of energy and resilience in performing tasks. Dedication refers to strong involvement and enthusiasm in teaching activities. Absorption describes the extent to which teachers are fully concentrated and immersed in their work. Altogether, these indicators illustrate the degree to which teachers are actively engaged and committed to their professional roles within the educational environment.

Data Collection Technique

Data were collected using a closed-ended questionnaire with a 1-5 Likert scale, developed based on theories and previous research findings. Each statement was adapted from validated instruments for engagement. Before being distributed, the instrument was validated by experts (expert judgment) and piloted on a small sample to ensure reliability and construct validity.

Data Analysis Technique

The data analysis in this study was carried out in two stages: the outer model analysis (measurement model) and the inner model analysis (structural model), using the SEM-PLS approach. The outer model analysis was conducted to evaluate the validity and reliability of the research constructs before examining the relationships between variables. This stage ensures that each indicator accurately measures the latent variable it represents. The assessment of convergent validity was determined by examining the loading factor values, with each indicator required to have a loading factor of at least 0.60 to be considered valid. Reliability was evaluated using Composite Reliability (CR), with a threshold of 0.70 indicating consistent internal reliability. In addition, Average Variance Extracted (AVE) was assessed to confirm convergent validity, with

values exceeding 0.50 demonstrating that the construct explains more than half of the variance of its indicators. Discriminant validity was examined using the Heterotrait-Monotrait Ratio (HTMT), where values below 0.90 indicate that constructs are empirically distinct from one another. The evaluation process was conducted iteratively: indicators that did not meet the specified criteria were removed, and recalculations were performed until all constructs satisfied the measurement model's feasibility standards.

Following the confirmation of the measurement model, the inner model analysis was conducted to examine the structural relationships among variables and to test both direct and indirect hypotheses. This stage analyzed the path coefficients (β) to determine the strength and direction of the relationships between variables. The explanatory power of the model was assessed using the R-Square (R^2) value, which indicates the proportion of variance explained by the independent variables. Statistical significance was determined using the T-test and p-value criteria. The findings reveal that Teacher Empowerment has a strong positive effect on Professional Commitment ($\beta = 0.557$), whereas Reward has a positive but weak effect ($\beta = 0.125$). Furthermore, Professional Commitment exerts a strong positive influence on Teacher Engagement ($\beta = 0.654$). The indirect effect analysis shows that Teacher Empowerment significantly influences Engagement through Professional Commitment ($\beta = 0.364$), indicating a meaningful mediating effect. Meanwhile, the indirect effect of Reward on Engagement through Professional Commitment is positive but weak ($\beta = 0.082$). The coefficient of determination (R^2) indicates that Professional Commitment has an R^2 value of 0.630, categorized as strong, and Teacher Engagement has an R^2 value of 0.749, categorized as very strong. These results indicate that the structural model explains more than 70% of the variance in teacher engagement through the combined influence of empowerment, reward, and professional commitment.

Results and Discussion

General Data Analysis Description

This study employs Multiple Linear Regression Analysis to examine the direct and indirect relationships between teacher empowerment, reward systems, professional commitment, and teacher engagement. Before conducting hypothesis testing, classical assumption tests were performed to ensure that the regression model met statistical requirements. These tests included tests for normality, homogeneity, linearity, and multicollinearity.

The normality test was conducted using the Kolmogorov–Smirnov test, which yielded a p-value of 0.200 ($p > 0.05$), indicating that the data were normally distributed. The Levene's Test for homogeneity of variance showed a significance value of 0.317 ($p > 0.05$), confirming that the data were homogeneous. The linearity test indicated a significance value of 0.000 ($p < 0.05$) for linearity and 0.421 ($p > 0.05$) for deviation from linearity, demonstrating that the relationships between variables were linear. Furthermore, the multicollinearity test showed tolerance values above 0.10 and Variance Inflation Factor (VIF) values below 10.00, specifically 1.842 for empowerment and 1.765 for reward, indicating no multicollinearity problem. These results confirm that the regression model satisfies all classical assumptions and is appropriate for further analysis.

The regression results reveal that teacher empowerment has a positive and significant effect on professional commitment ($\beta = 0.557$, $p < 0.001$). Reward systems also show a positive but weak effect on professional commitment ($\beta = 0.125$, $p = 0.041$). Professional commitment significantly affects teacher engagement ($\beta = 0.654$, $p < 0.001$). The coefficient of determination (R^2) for professional commitment is 0.630, while for teacher engagement it is 0.749. This indicates that

74.9 percent of the variance in teacher engagement is explained by empowerment and reward, mediated by professional commitment.

Direct and Indirect Effects Between Variables

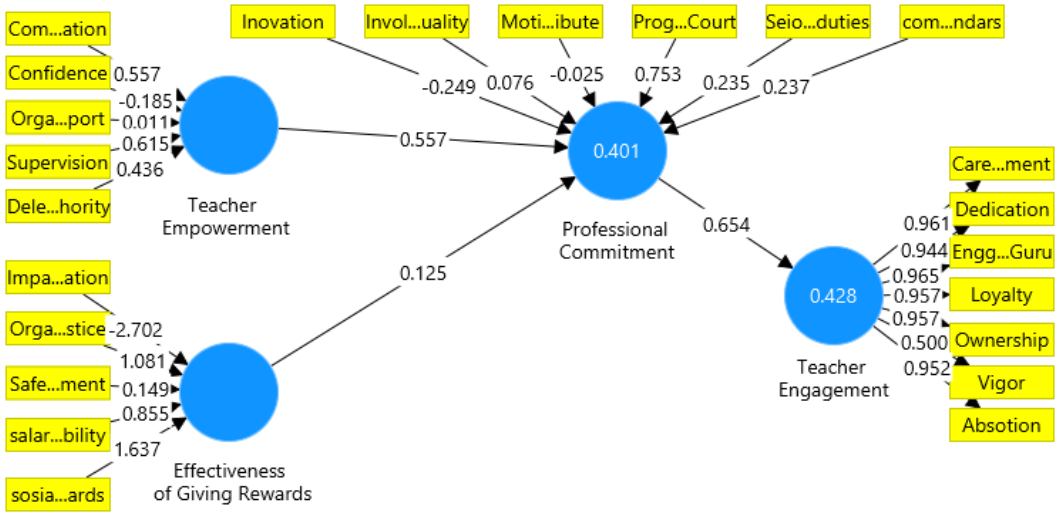

Image 1. Results of the Analysis of Direct and Indirect Influences Between Variables

Table 1. Direct and Indirect Influences Between Variables

Relationship Path	Coefficient	Description
Direct Influence		
Teacher Empowerment → Professional Commitment	0.557	Positive and quite strong influence
Effectiveness of Reward Giving → Professional Commitment	0.125	Positive but weak influence
Professional Commitment → Engagement	0.654	Positive and strong influence
Indirect Influence (Mediation)		
Teacher Empowerment → Professional Commitment → Engagement	0.364	Mediation is significant and quite strong
Reward Effectiveness → Professional Commitment → Engagement	0.082	Weak mediation

Based on the results of the SEM-PLS analysis, Teacher Empowerment has a strong direct influence on Professional Commitment (0.557), whereas Reward Effectiveness has only a weak influence (0.125). Professional Commitment is strongly positively associated with Teacher Engagement (0.654), indicating that higher professional commitment is associated with greater engagement. The indirect path shows that Teacher Empowerment through Professional Commitment has a significant mediating effect (0.364), whereas Reward has only a weak mediating effect (0.082). This finding confirms that teacher empowerment is a more effective strategy than the reward system in increasing teacher engagement, because it is strengthened by the significant mediating role of professional commitment (Hafsah et al., 2026).

Outer Model Analysis
Outer Model Analysis of Teacher Engagement (Y)

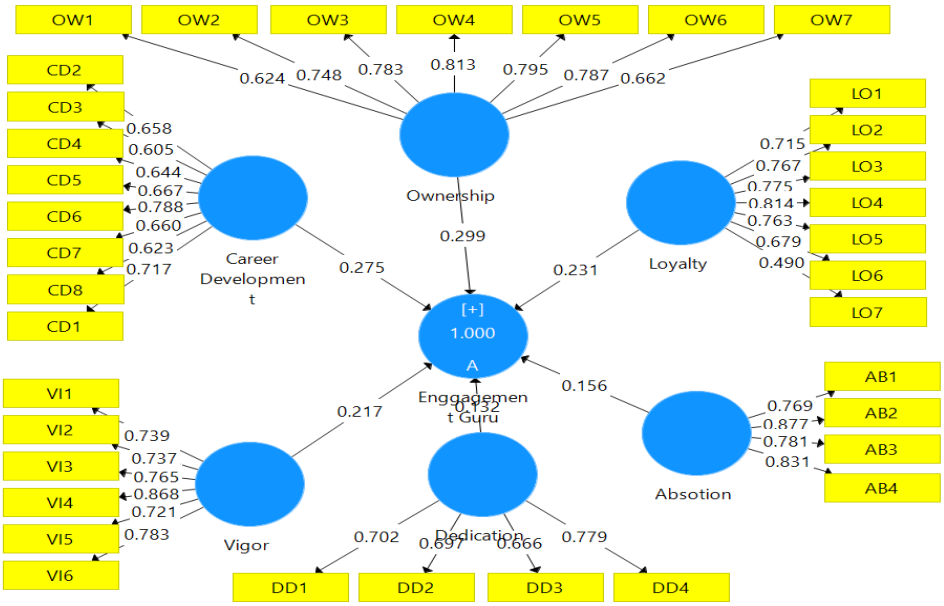

Image 2. Outer Model Calculation for The Teacher Engagement (Y)

Based on the chart above, not all items have a Loading Factor value above 0.6; therefore, measurement items that do not meet the criteria (Loading Factor value <0.6) are considered for reduction. The reduction process is carried out in stages, starting from the smallest value, and for each reduction in measurement items, the Loading Factor for each measurement item is recalculated and re-observed until all measurement items meet the criterion: a Loading Factor > 0.6. The following is a recapitulation of the Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and HTMT values of the Teacher Engagement Variable (Y).

Table 2. Factor Loading Values, (CR) and (AVE) Stage 1 of Teacher Engagement (Y)

Indikator	Item	Outer Loading	CR	AVE
Career Development	CD1	0.717	0.868	0.452
	CD2	0.658		
	CD3	0.605		
	CD4	0.644		
	CD5	0.667		
	CD6	0.788		
	CD7	0.660		
	CD8	0.623		
Ownership	OW1	0.624	0.898	0.559
	OW2	0.748		
	OW3	0.783		
	OW4	0.813		
	OW5	0.795		
	OW6	0.787		
	OW7	0.662		
Loyalty	LO1	0.721	0.882	0.521
	LO2	0.787		
	LO3	0.789		

Indikator	Item	Outer Loading	CR	AVE
	LO4	0.824		
	LO5	0.769		
	LO6	0.673		
	LO7	0.490		
Vigor	VI1	0.739	0.897	0.593
	VI2	0.737		
	VI3	0.765		
	VI4	0.868		
	VI5	0.782		
	VI6	0.721		
Dedication	DD1	0.703	0.804	0.508
	DD2	0.697		
	DD3	0.666		
	DD4	0.780		
Absotion	AB1	0.769	0.888	0.665
	AB2	0.877		
	AB3	0.781		
	AB4	0.831		

Based on the table above, it is known that there is a measurement item with a Loading Factor value <0.6, namely: LO7, so the measurement item was reduced. The Average Variance Extracted (AVE) value for CD remains below 0.5, indicating it does not meet the validity requirements. Meanwhile, the Composite Reliability (CR) values for all indicators are >0.7, thus also meeting reliability requirements. Next, a remeasurement was conducted after reducing one measurement item: LO1 and the two lowest career development values so that the AVE values meet the requirements: CD 3 and CD 8. The following are the results of the remeasurement of the Outer Variable Teacher Engagement (Y).

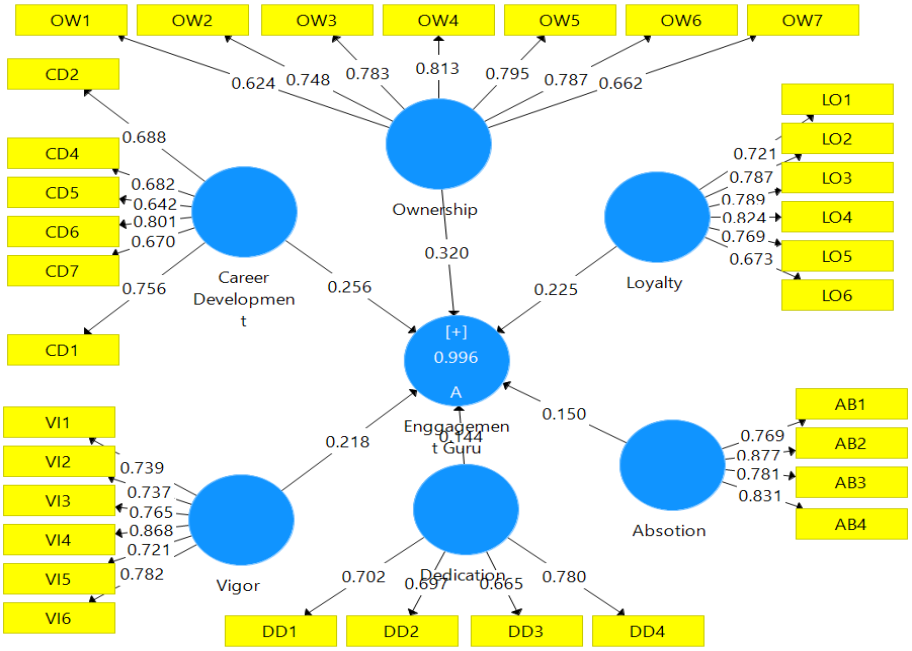

Image 3. The Outer Model of the Teacher Engagement (Y)

The following is a recapitulation of the Loading Factor, Composite Reliability (CR), and Average Variance Extracted (AVE) values of the Teacher Engagement Variable (Y) from the chart above.

Table 3. Factor Loading Values (CR) and AVE Stage 2 of Teacher Engagement (Y)

Indicator	Item	Outer Loading	CR	AVE
Career Development	CD1	0.756	0.857	0.502
	CD2	0.688		
	CD3	0.682		
	CD5	0.642		
	CD6	0.801		
	CD7	0.670		
	CD8	0.756		
Ownership	OW1	0.624	0.898	0.559
	OW3	0.748		
	OW4	0.783		
	OW5	0.813		
	OW6	0.795		
	OW7	0.787		
Loyalty	LO1	0.721	0.892	0.581
	LO2	0.787		
	LO3	0.789		
	LO4	0.824		
	LO5	0.769		
	LO6	0.673		
	LO7	0.721		
Vigor	VI1	0.739	0.897	0.593
	VI2	0.737		
	VI3	0.765		
	VI4	0.868		
	VI5	0.721		
	VI6	0.782		
Dedication	DD1	0.702	0.804	0.508
	DD2	0.697		
	DD3	0.665		
	DD4	0.780		
Absorpion	AB1	0.769	0.888	0.665
	AB2	0.877		
	AB3	0.781		
	AB4	0.831		

Based on the table above, all measurement items have a Loading Factor> 0.6, indicating they meet the criteria and are valid. Likewise, the Average Variance Extracted (AVE) value for all indicators is > 0.5, thus meeting the validity requirements. Furthermore, the Composite Reliability (CR) value for all indicators is > 0.7, thus also meeting the reliability requirements. Furthermore, the Heterotrait-Monotrait Ratio (HTMT) value for each indicator of the Teacher Engagement variable (Y) is shown below.

Table 4. The Heterotrait-Monotrait Ratio of The Teacher Engagement (Y)

	AB	CD	DE	LI	OW
AB					
CD	0.552				

	AB	CD	DE	LI	OW
DE	0.703	0.781			
LI	0.408	0.576	0.376		
OW	0.611	0.715	0.630	0.689	
VI	0.349	0.641	0.720	0.304	0.507

From the table above, the HTMT values for all indicators are <0.9, so Discriminant Validity is achieved. Thus, the Outer Model measurement for the Teacher Engagement variable (Y) can be carried over to the next stage because the Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and Heterotrait-Monotrait Ratio (HTMT) values have met the criteria.

Outer Model Analysis of the Teacher Empowerment (X1)

The results of the Outer Model of the Teacher Empowerment variable (X1) using the algorithm iteration in Smart Pls 3 are as follows:

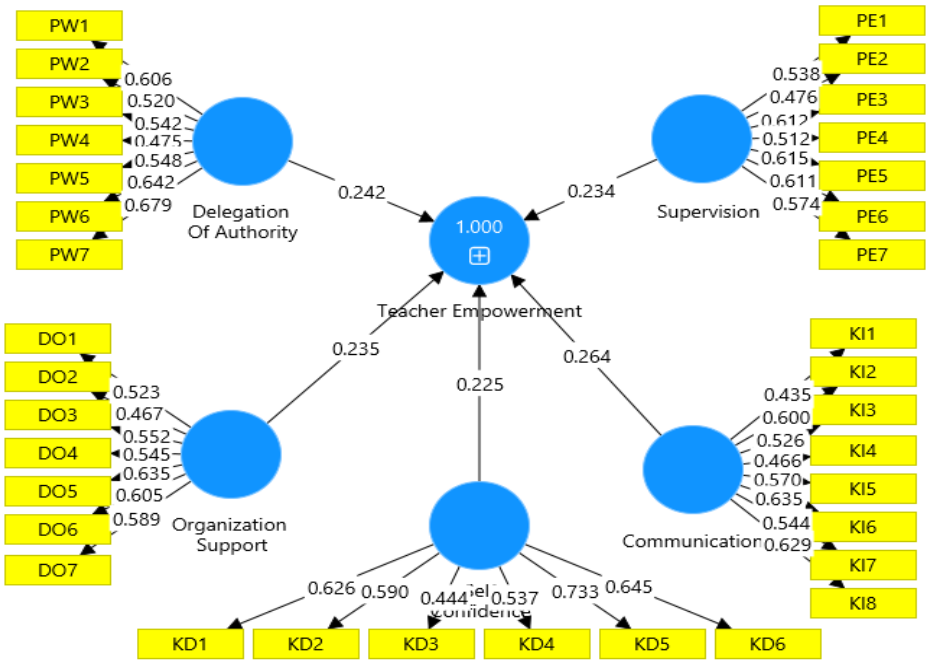

Image 4. The Outer Model for the Teacher Empowerment (X1)

In the chart above, not all items have a Loading Factor value above 0.6, so measurement items that do not meet the criteria (Loading Factor value <0.6) are considered for reduction (Olaivar & Loayon, 2022). The reduction process is carried out in stages, starting from the smallest value, and for each reduction in measurement items, the Loading Factor values for each indicator's measurement items are recalculated and re-observed until all measurement items meet the criteria, namely a Loading Factor value > 0.6. The following is a recapitulation of the Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and HTMT values of the Teacher Empowerment variable (X1).

Table 5. The Loading Factor, CR, AVE, and HTMT of the Teacher Empowerment (X1)

Indicator	Item	Outer Loading	CR	AVE
Delegation of authority	PW1	0.622	0.872	0.501
	PW2	0.450		

Indicator	Item	Outer Loading	CR	AVE
	PW3	0.677		
	PW4	0.780		
	PW5	0.788		
	PW6	0.786		
	PW7	0.782		
Supervision	PE1	0.736	0.860	0.483
	PE2	0.715		
	PE3	0.353		
	PE4	0.455		
	PE5	0.812		
	PE6	0.837		
	PE7	0.798		
Organizational Support	DO1	0.710	0.879	0.519
	DO2	0.388		
	DO3	0.778		
	DO4	0.737		
	DO5	0.765		
	DO6	0.797		
	DO7	0.781		
Confidence	KD1	0.716	0.817	0.428
	KD2	0.673		
	KD3	0.561		
	KD4	0.684		
	KD5	0.661		
	KD6	0.617		
Communication	KI1	0.563	0.902	0.539
	KI2	0.792		
	KI3	0.543		
	KI4	0.802		
	KI5	0.823		
	KI6	0.823		
	KI7	0.747		
	KI8	0.718		

Based on the table above, it is known that there are measurement items with a Loading Factor value < 0.6, namely: PW2, PE3, PE4, DO2, KD3, KI1, and KI3, so these measurement items were reduced, while other measurement items met the criteria, meaning they are all valid. The Average Variance Extracted (AVE) value still indicates that indicators such as Supervision and Self-confidence exceed 0.5, which means they do not meet the validity requirements. Meanwhile, the Composite Reliability (CR) value for all indicators is > 0.7, thus meeting the reliability requirements. A remeasurement was then performed after reducing the 7 items PW2, PE3, PE4, DO2, KD3, KI1, and KI3 that did not meet the criteria. Below are the results of the remeasurement of the Teacher Empowerment (X1) Outer variable.

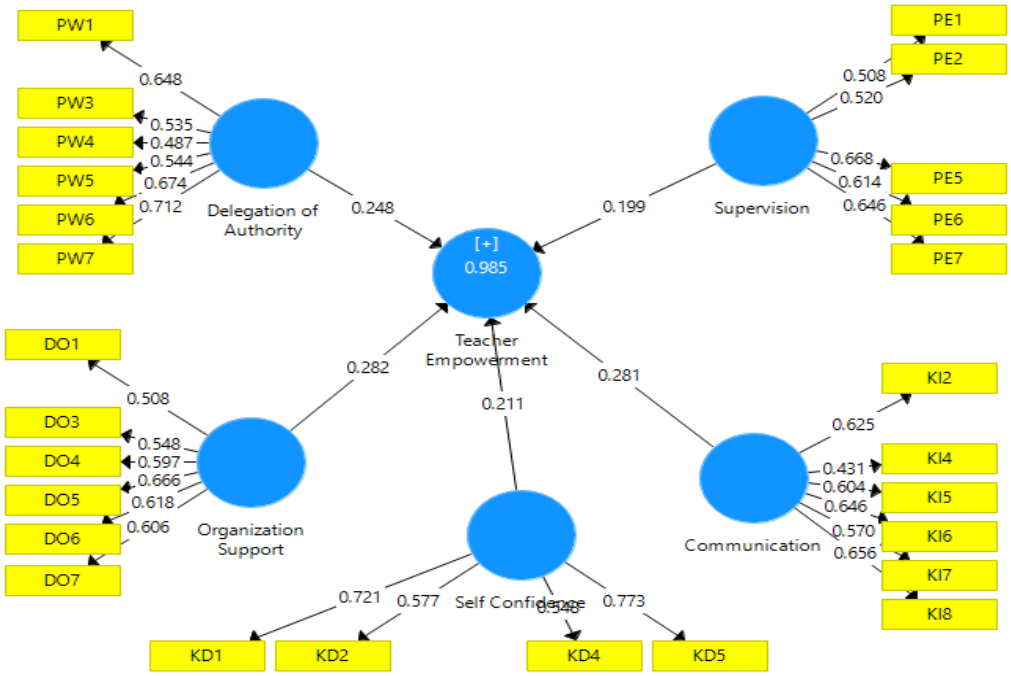

Image 5. The remeasurement of the Teacher Empowerment (X1) Outer variable

Below is the recap of the Loading Factor, Composite Reliability (CR), and Average Variance Extracted (AVE) values for the Teacher Empowerment (X1) variable from the diagram above.

Table 6. The recap of Loading Factor, CR, and AVE values for the Teacher Empowerment (X1)

Indikator	Item	Outer Loading	CR	AVE
Delegation of authority	PW1	0.614	0.879	0.550
	PW3	0.678		
	PW4	0.743		
	PW5	0.817		
	PW6	0.800		
	PW7	0.778		
Supervision	PE1	0.775	0.867	0.566
	PE2	0.719		
	PE5	0.688		
	PE6	0.794		
	PE7	0.781		
Organizational Support	DO1	0.715	0.896	0.590
	DO3	0.784		
	DO4	0.728		
	DO5	0.775		
	DO6	0.795		
	DO7	0.807		
Confidence	KD1	0.725	0.802	0.503
	KD2	0.698		
	KD5	0.710		
	KD6	0.702		
Communication	KI2	0.802	0.911	0.632

Indikator	Item	Outer Loading	CR	AVE
	KI4	0.841		
	KI5	0.818		
	KI6	0.824		
	KI7	0.745		
	KI8	0.734		

Based on the table above, all measurement items have a Loading Factor> 0.6, indicating they meet the criteria and are valid. For the Average Variance Extracted (AVE), all indicators exceed 0.5, indicating they meet the validity requirements (Leung & Lam, 2025). Additionally, the Composite Reliability (CR) value for all indicators is > 0.7, thus meeting the reliability requirements. Furthermore, the Heterotrait-Monotrait Ratio (HTMT) values for each indicator of the Teacher Empowerment (X1) variable are as follows.

Table 7. HTMT value of the Teacher Empowerment Variable indicator (X1)

	DO	KD	KI	PW
KD	0.884			
KI	0.476	0.712		
PW	0.818	0.734	0.335	
PE	0.882	0.863	0.488	0.858

In the table above, the HTMT values for all indicators are < 0.9, indicating that discriminant validity has been achieved. Therefore, the Outer Model measurement for the Teacher Empowerment (X1) variable can proceed to the next stage, as the values for Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and Heterotrait-Monotrait Ratio have all met the criteria (Buksnyte-Marmiene et al., 2022).

Outer Model Analysis of the Reward Effectiveness (X2)

The results of the Outer Model of the Reward Effectiveness variable (X2) using the Smart Pls 3 algorithm iteration are as follows:

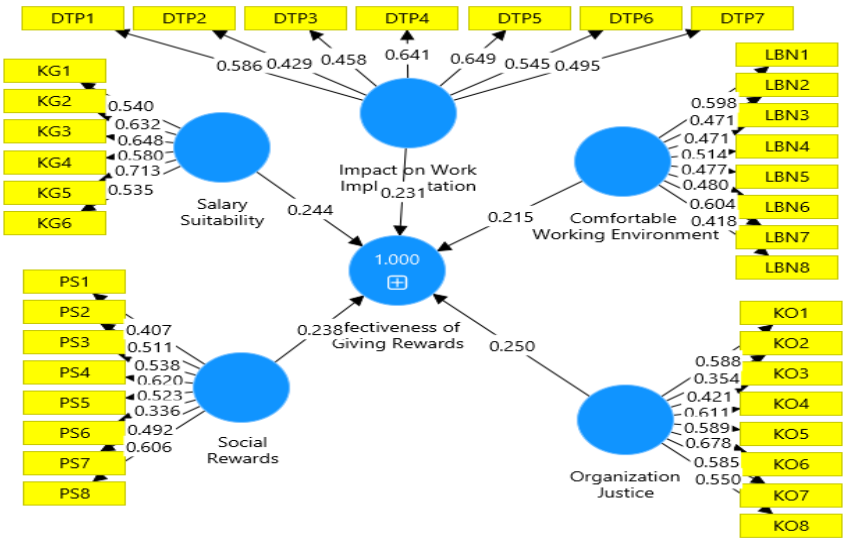

Image 6. The Outer Model for the Effectiveness of Reward Giving (X2)

In the diagram above, not all items have a Loading Factor above 0.6; therefore, measurement items that do not meet the criteria (Loading Factor < 0.6) are considered for reduction. The reduction process is carried out step by step, starting with the smallest values. After each item reduction, recalculations are performed, and the Loading Factor values for the measurement items for each indicator are observed until all measurement items meet the criterion of a Loading Factor> 0.6. Below is the recap of the Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and HTMT values for the Reward Effectiveness (X2) variable.

Table 8. Factor Loading, CR, and AVE Values for the Reward Effectiveness (X2)

Indicator	Item	Outer Loading	CR	AVE
Salary match	KG1	0.874	0.923	0.671
	KG2	0.866		
	KG3	0.921		
	KG4	0.898		
	KG5	0.721		
	KG6	0.583		
Impact on work implementation	DTP1	0.811	0.926	0.643
	DTP2	0.874		
	DTP3	0.857		
	DTP4	0.868		
	DTP5	0.713		
	DTP6	0.774		
	DTP7	0.697		
Comfortable working environment	LBN1	0.533	0.882	0.488
	LBN2	0.677		
	LBN3	0.533		
	LBN4	0.714		
	LBN5	0.764		
	LBN6	0.765		
	LBN7	0.779		
	LBN8	0.769		
Social rewards	PS1	0.636	0.850	0.417
	PS2	0.632		
	PS3	0.699		
	PS4	0.627		
	PS5	0.754		
	PS6	0.588		
	PS7	0.562		
	PS8	0.648		
Organizational justice	KO1	0.754	0.898	0.530
	KO2	0.763		
	KO3	0.736		
	KO4	0.787		
	KO5	0.841		
	KO6	0.822		
	KO7	0.497		
	KO8	0.545		

Based on the table above, there are measurement items with a Loading Factor < 0.6: KG6, PS6, PS7, LBN1, LBN3, KO7, and KO8. These measurement items were reduced, while other

measurement items met the criteria, indicating that all are valid. However, the Average Variance Extracted (AVE) value for some indicators remains < 0.5, indicating the validity requirements have not been fully met. The Composite Reliability (CR) value for all indicators is > 0.7, which satisfies the reliability requirements (Figueiredo et al., 2025).

Subsequently, a remeasurement was conducted after reducing the 7 measurement items: KG6, PS6, PS7, LBN1, LBN3, KO7, and KO8 that did not meet the criteria. After reducing these 7 items, the AVE value for the Social Recognition indicator remained below 0.5. Therefore, it is necessary to reduce the PS item with the lowest value, namely PS4. Below are the results of the remeasurement for the Outer variable of the Reward Effectiveness (X2) variable.

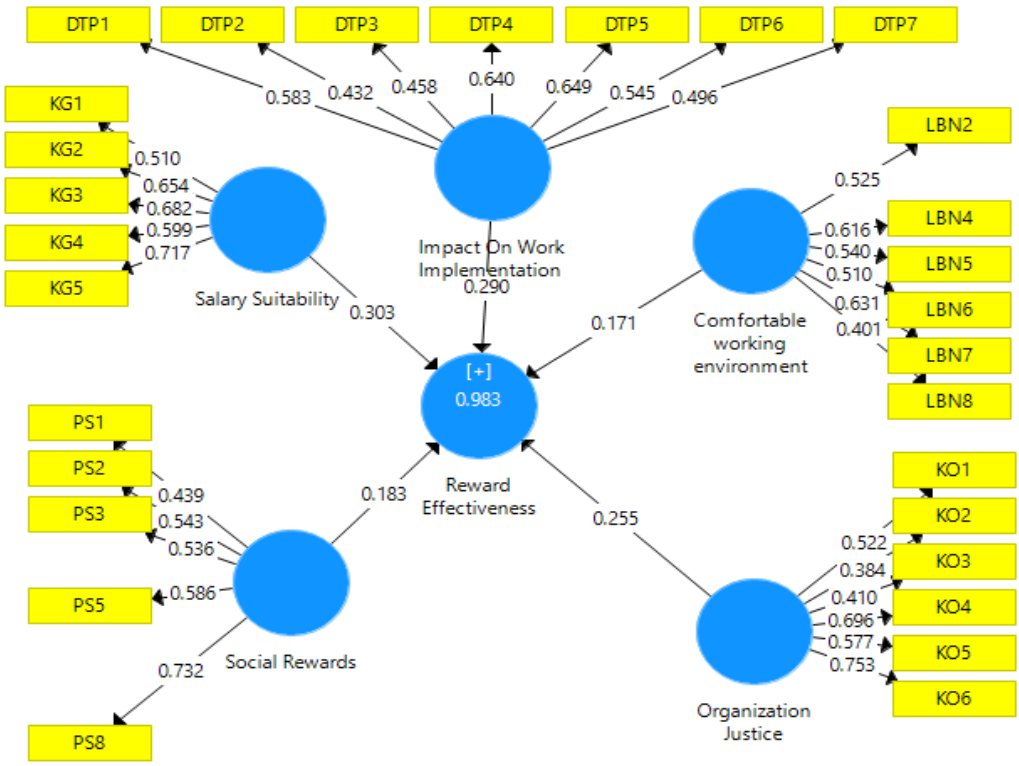

Image 7. The outer model of the reward effectiveness variable (X2)

The following is a recapitulation of the Loading Factor, Composite Reliability (CR), and Average Variance Extracted (AVE) values of the Reward Giving Effectiveness Variable (X2) from the chart above.

Table 9. Loading Factor, CR, and AVE Stage 2 of the Reward Effectiveness (X2)

Indikator	Item	Outer Loading	CR	AVE
Salary match	KG1	0.889	0.953	0.771
	KG2	0.878		
	KG3	0.924		
	KG4	0.902		
	KG5	0.737		
Impact on work implementation	DTP1	0.811	0.953	0.742
	DTP2	0.873		
	DTP3	0.856		
	DTP4	0.868		

Indikator	Item	Outer Loading	CR	AVE
	DTP5	0.713		
	DTP6	0.775		
	DTP7	0.698		
Comfortable working environment	LBN2	0.666	0.960	0.750
	LBN4	0.728		
	LBN5	0.785		
	LBN6	0.828		
	LBN7	0.840		
	LBN8	0.788		
Social rewards	PS1	0.779	0.950	0.731
	PS2	0.768		
	PS3	0.642		
	PS5	0.663		
	PS8	0.674		
Organizational justice	KO1	0.899	0.956	0.785
	KO4	0.894		
	KO5	0.857		
	KO6	0.911		
	KO7	0.882		
	KO8	0.874		

Based on the table above, all measurement items have Loading Factor values >0.6, indicating they meet the criteria and are valid. The Average Variance Extracted (AVE) values for all indicators are >0.5, thus meeting the validity requirements. Furthermore, the Composite Reliability (CR) values for all indicators are >0.7, thus also meeting the reliability requirements. The following are the Heterotrait-Monotrait Ratio (HTMT) values for each indicator of the Reward Effectiveness variable (X2).

Table 10. HTMT values for the Reward Effectiveness variable (X2)

	DTP	KO	KG	LBN
KO	0.344			
KG	0.667	0.168		
LBN	0.776	0.516	0.584	
PS	0.666	0.399	0.649	0.624

In the table above, the HTMT values for all indicators are <0.9, thus meeting the criterion for Discriminant Validity. Therefore, the Outer Model measurement for the Reward Effectiveness variable (X2) can proceed to the next stage because the Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and Heterotrait-Monotrait Ratio (HTMT) values meet the criteria.

Professional Commitment Variable Model (X3)

The results of the Outer Model for the Professional Commitment variable (X3) using the iteration algorithm in Smart Pls 3 are as follows.

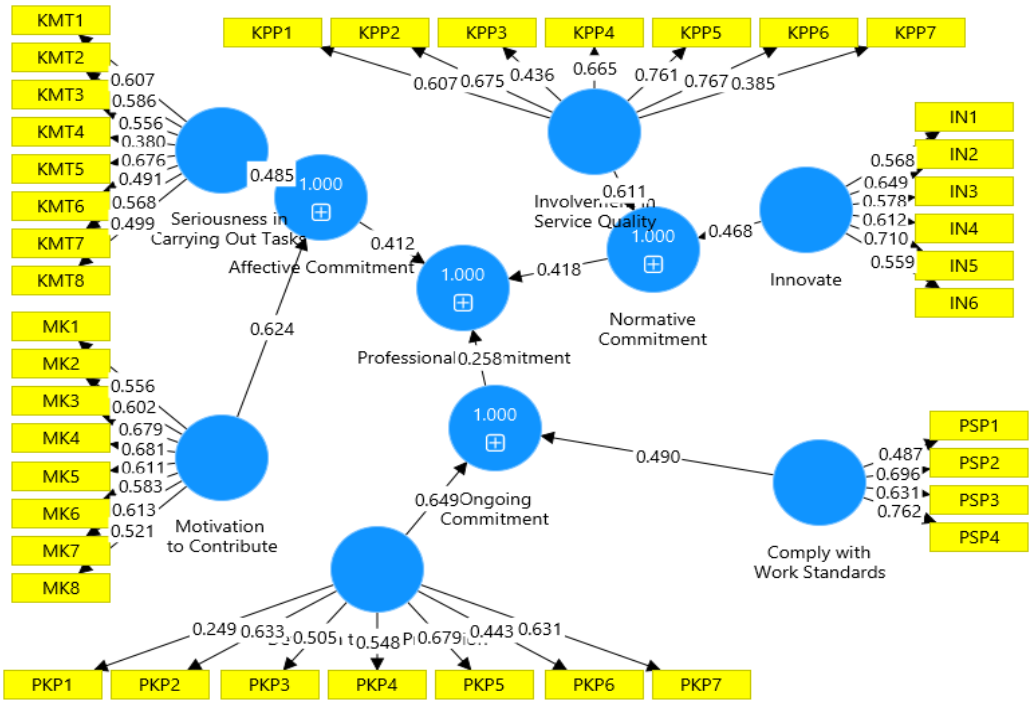

Image 8. Results of the Outer Model Calculation Stage 1 Professional Commitment (X3)

Based on the diagram above, not all items have a Loading Factor value above 0.6, so measurement items that do not meet the criteria (Loading Factor < 0.6) are considered for reduction. The reduction process is carried out step by step, starting with the items with the lowest values. After each item reduction, recalculations are performed, and the Loading Factor values of the measurement items for each indicator are observed until all measurement items meet the criteria, which is a Loading Factor value > 0.6. Below is the recap of the Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and HTMT values for the Professional Commitment (X3) variable.

Table 11. The Loading Factor, CR, AVE and HTMT the Professional Commitment (X3)

Indicator	Item	Outer Loading	CR	AVE
Seriousness in carrying out duties	KMT1	0.740	0.589	0.384
	KMT2	0.697		
	KMT3	0.602		
	KMT4	0.296		
	KMT5	0.445		
	KMT6	0.693		
	KMT7	0.710		
	KMT8	-0.637		
Motivation to contribute	MK1	0.373	0.697	0.445
	MK2	0.839		
	MK3	0.869		
	MK4	0.801		
	MK5	-0.603		
	MK6	0.693		
	MK7	0.445		

Indicator	Item	Outer Loading	CR	AVE
	MK8	0.527		
Involvement in service quality	KPP1	0.739	0.763	0.355
	KPP2	0.734		
	KPP3	0.584		
	KPP4	0.339		
	KPP5	0.050		
	KPP6	0.668		
	KPP7	0.703		
innovate	IN1	0.704	0.905	0.615
	IN2	0.781		
	IN3	0.782		
	IN4	0.818		
	IN5	0.806		
	IN6	0.809		
Devotion to the Profession	PKP1	0.471	0.862	0.478
	PKP2	0.603		
	PKP3	0.786		
	PKP4	0.814		
	PKP5	0.668		
	PKP6	0.697		
	PKP7	0.739		
Comply with work standards	PSP1	0.761	0.447	0.431
	PSP2	0.567		
	PSP3	-0.627		
	PSP4	0.655		

Based on the table above, it is known that there are measurement items with a Loading Factor value < 0.6, namely: KMT4, KMT5, KMT8, Mk1, MK7, MK8, PKP1, PSP2, PSP3, KPP3, KPP4, and KPP5. These measurement items were reduced, while other measurement items met the criteria, indicating that all are valid. The Average Variance Extracted (AVE) value for some indicators is < 0.5, specifically for the indicators of Commitment to Tasks, Involvement in Service Quality, and Devotion to the Profession, meaning they do not meet the validity requirements. Additionally, the Composite Reliability (CR) value for some indicators is < 0.7, specifically for Commitment to Tasks and Motivation to Contribute.

Subsequently, a remeasurement was conducted after reducing the 12 measurement items: KMT4, KMT5, KMT8, Mk1, MK7, MK8, PKP1, PSP2, PSP3, KPP3, KPP4, and KPP5, which did not meet the criteria. Below are the results of the remeasurement for the Outer variable of Professional Commitment (X4).

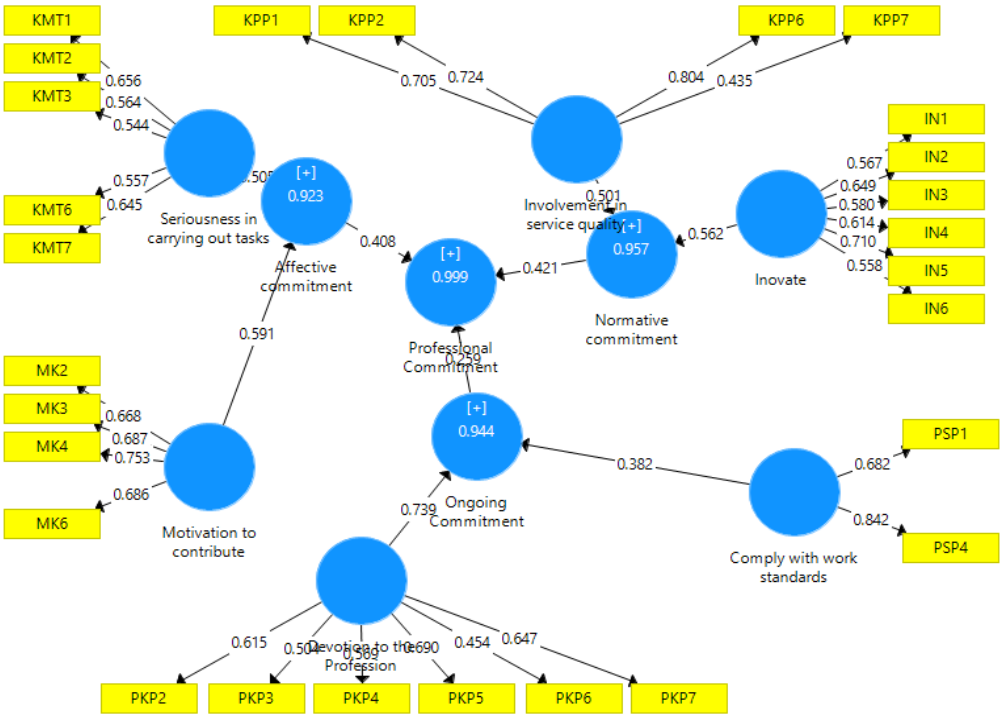

Image 9. The Remeasurement for the Outer Professional Commitment (X3)

The following is a recapitulation of the Loading Factor, Composite Reliability (CR), and Average Variance Extracted (AVE) values of the Professional Commitment variable (X3) from the chart above.

Table 12. The Loading Factor, CR, and AVE of the Professional Commitment (X3)

Indicator	Item	Outer Loading	CR	AVE
Seriousness in carrying out duties	KMT1	0.733	0.844	0.520
	KMT2	0.741		
	KMT3	0.660		
	KMT6	0.749		
	KMT7	0.717		
Motivation to contribute	MK2	0.881	0.905	0.706
	MK3	0.850		
	MK4	0.864		
	MK5	0.761		
	MK6	0.881		
Involvement in service quality	KPP1	0.811	0.833	0.555
	KPP2	0.763		
	KPP6	0.726		
	KPP7	0.675		
innovate	IN1	0.704	0.905	0.615
	IN2	0.781		
	IN3	0.782		
	IN4	0.818		
	IN5	0.806		
	IN6	0.809		
Devotion to the Profession	PKP2	0.619	0.870	0.528

Indicator	Item	Outer Loading	CR	AVE
	PKP3	0.793		
	PKP4	0.804		
	PKP5	0.684		
	PKP6	0.685		
	PKP7	0.759		
Comply with work standards	PSP1	0.903	0.759	0.617
	PSP4	0.648		

Based on the table above, all measurement items have a Loading Factor> 0.6, indicating they meet the criteria and are valid. Likewise, the Average Variance Extracted (AVE) value for all indicators is > 0.5, thus meeting the validity requirements. Furthermore, the Composite Reliability (CR) value for all indicators is > 0.7, thus also meeting the reliability requirements. Next, the Heterotrait-Monotrait Ratio (HTMT) value for each indicator of the Professional Commitment variable (X3) is shown.

Table 13. The HTMT value for each indicator of the Professional Commitment (X3)

	KMT	KKP	MK	PSP	PKP
KMT					
KKP	0.380				
MK	0.848	0.411			
PSP	0.707	0.504	0.794		
PKP	0.676	0.576	0.769	0.827	
IN	0.423	0.834	0.528	0.489	0.532

In the table above, the HTMT values for all indicators are <0.9, thus meeting the criterion for Discriminant Validity. Therefore, the Outer Model measurement for the Professional Commitment variable (X4) can proceed to the next stage because the Loading Factor, Composite Reliability (CR), Average Variance Extracted (AVE), and Heterotrait-Monotrait Ratio (HTMT) values have met the criteria.

Analysis of the Coefficient of Determination (R-Square)

According to J. Hari, the coefficient of determination (R-Square) is a method for assessing the extent to which an endogenous construct can be explained by an exogenous construct. The coefficient of determination (R-Square) value ranges from 0 to 1. An R^2 value of 0.75 indicates substantial (strong), a value of 0.50 indicates moderate, and a value of 0.25 indicates weak. The following values of the coefficient of determination (R-Square) are shown in the table below.

Table 14. The Coefficient of Determination (R-Square)

	R Square	*R Square Adjusted*
Organizational culture	0.377	0.368
Teacher Engagement	0.749	0.742
Professional Commitment	0.630	0.624

The findings of this study demonstrate that teacher empowerment has a strong and significant effect on professional commitment ($\beta = 0.557$, $p < 0.001$). This indicates that when teachers are given autonomy, trust, meaningful participation in decision-making, and organizational support, they develop a stronger sense of responsibility and professional identity. Empowerment strengthens intrinsic motivation because teachers feel valued and capable of influencing institutional outcomes. This result reinforces empowerment theory, particularly the psychological

empowerment framework proposed by Spreitzer, which highlights meaning, competence, self-determination, and impact as core dimensions that enhance individual commitment. Compared to previous studies that primarily examined direct relationships between empowerment and engagement, this study provides novelty by positioning professional commitment as a mediating variable within a multiple linear regression framework. The findings reveal that empowerment not only directly influences engagement but also indirectly strengthens engagement through professional commitment, thus offering a more comprehensive explanatory model in the context of secondary education.

In contrast, the reward system shows a positive but relatively weak effect on professional commitment ($\beta = 0.125$, $p = 0.041$). This suggests that financial compensation and extrinsic incentives alone are insufficient to cultivate deep professional attachment among teachers. Professional commitment appears to be more strongly influenced by intrinsic values, a sense of calling, and professional identity than by material rewards. This finding aligns with motivational theories such as Self-Determination Theory, which emphasizes the importance of intrinsic motivation over extrinsic incentives in sustaining long-term engagement. The practical implication of this result is that school management should not rely solely on financial reward mechanisms but should integrate non-material recognition, professional development opportunities, and participatory leadership practices to strengthen teachers' psychological attachment to their profession (Gulo et al., 2026).

Furthermore, professional commitment has a strong and significant influence on teacher engagement ($\beta = 0.654$, $p < 0.001$), indicating that teachers who are highly loyal, dedicated, and committed to professional values tend to demonstrate greater vigor, dedication, and absorption in their work. This finding confirms previous research stating that commitment acts as a psychological resource that enhances work engagement by fostering emotional and cognitive attachment to tasks. The coefficient of determination ($R^2 = 0.749$) indicates that 74.9 percent of the variance in teacher engagement is explained by empowerment and reward through professional commitment, highlighting the model's substantial explanatory power. Theoretically, this strengthens the integration between empowerment theory and work engagement theory by empirically demonstrating that intrinsic organizational factors are dominant predictors of teacher engagement in educational institutions.

Despite these contributions, this study has several limitations. First, the research was conducted within a specific regional context and limited to secondary school teachers, which may restrict the generalizability of the findings to other educational levels or regions. Second, the use of self-reported questionnaires may introduce common method bias and subjective response tendencies. Third, the cross-sectional design limits the ability to examine causal relationships over time. Therefore, future research is recommended to expand the sample to include different educational settings, use longitudinal designs to observe changes in engagement over time, and incorporate mixed-method approaches to obtain deeper qualitative insights. Additionally, future studies may explore other mediating or moderating variables such as organizational culture, leadership style, or job satisfaction to enrich the explanatory model.

Overall, this study contributes both theoretically and practically. Theoretically, it provides empirical evidence that empowerment plays a more dominant role than reward systems in enhancing teacher engagement through professional commitment. Practically, it emphasizes that educational institutions should prioritize empowerment-based management strategies, strengthen professional identity, and design balanced reward systems that integrate intrinsic and extrinsic motivational elements to sustain teacher engagement and improve educational quality.

Conclusion

In conclusion, this study answers the research questions by confirming that teacher empowerment significantly strengthens professional commitment and teacher engagement, while reward systems play a supportive but less dominant role. Teachers who experience autonomy, trust, participation in decision-making, and organizational support tend to develop stronger professional commitment, which in turn enhances their emotional, cognitive, and behavioral engagement at work. Professional commitment serves as a crucial mediating factor, bridging empowerment and engagement more effectively than reward mechanisms. These findings indicate that teacher engagement is primarily driven by intrinsic motivational factors related to professional values, responsibility, and sense of purpose rather than by extrinsic incentives alone. Therefore, efforts to improve teacher engagement should prioritize empowerment-based management practices and the reinforcement of professional commitment to create sustainable engagement within educational institutions.

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