

DYNAMIC MODELING OF HONORARY TEACHERS' PERFORMANCE: TRAINING, MOTIVATION, AND RETENTION

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Introduction

Honorary teachers constitute one of the essential components of the Indonesian education system. Their presence fills the gap in public schools where the number of civil servant teachers remains limited. Nevertheless, the status and position of honorary teachers are still widely debated, as they are not fully recognized as equivalent to civil servant teachers. According to the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek, 2023), the total number of teachers in Indonesia in 2023 reached more than 2.9 million, of which approximately 1.1 million were still employed as honorary teachers. In West Java, the number of honorary teachers is significantly high, particularly in Bandung City, which serves as one of the major educational centers. This condition highlights the vital role of honorary teachers in sustaining primary and secondary education services.

However, honorary teachers face numerous challenges, including relatively low salaries, unclear employment status, and limited access to training and professional development opportunities. The average income of honorary teachers in various regions, including Bandung City, remains far below the regional minimum wage, thereby affecting their welfare and motivation (Pratiwi & Handayani, 2021). These limitations contribute to retention problems, as many honorary teachers leave the profession for other occupations perceived as more economically stable. The high turnover rate of honorary teachers ultimately undermines the continuity and quality of education in schools.

Motivation is a crucial factor that determines the performance of honorary teachers. Work motivation theories indicate that motivation is not solely influenced by financial factors but also by non-financial rewards such as social recognition, opportunities for self-development, and employment security (Amri, 2020). In the context of honorary teachers in Bandung City, motivation often becomes a dilemma: while unstable working conditions reduce teaching enthusiasm, some teachers remain committed due to a sense of dedication. On the other hand, retention is closely associated with continuous training. Sulistiyowati's study (2022) demonstrates that adequate professional training and development not only enhance teachers' competencies but also foster loyalty and reduce the tendency to leave the profession. This finding illustrates the strong interconnection between training, motivation, retention, and teacher performance.

Unfortunately, studies on honorary teachers in Indonesia, particularly in West Java, are still dominated by descriptive or simple quantitative approaches that focus only on one or two variables. Research examining the complex relationships among training, motivation, retention, and performance remains scarce. In reality, these issues are multidimensional and dynamic, and

therefore cannot be adequately explained through linear approaches. In this regard, system thinking provides a novel perspective to understand the interrelations among variables more comprehensively. System thinking enables researchers to map causal relationships through a causal loop diagram (CLD) and simulate policy dynamics using stock and flow models (Sterman, 2020). This approach helps explain how consistent training enhances motivation, how motivation contributes to retention, and how retention influences the long-term performance of honorary teachers in Bandung City.

The local context of Bandung City further reinforces the urgency of this study. As a metropolitan city and an educational hub in West Java, Bandung faces multiple challenges in managing school numbers, increasing student enrollment, and addressing the shortage of permanent teachers. Reliance on honorary teachers has become a pragmatic policy choice in the short term. Nevertheless, without sustainable training strategies, enhanced motivation, and clear retention policies, such reliance may weaken the quality of education. Hence, understanding the dynamic patterns among training, motivation, retention, and performance of honorary teachers is crucial for developing more sustainable education policies.

This study seeks to address this research gap by proposing a dynamic model that explains the interconnections among training, motivation, and retention in shaping the performance of honorary teachers in Bandung City. By integrating empirical data through a system thinking approach, this study not only describes the existing conditions but also provides policy simulation scenarios that may assist local governments, particularly the Bandung City Education Office, in improving the management of honorary teachers. The findings are expected to contribute theoretically to the human resource management literature in the education sector and practically to the formulation of policies that are more responsive to the needs of honorary teachers.

Literature Review

Educational Human Resources and Honorary Teachers

The literature on educational human resources (HR) in Indonesia highlights the position of honorary teachers as both crucial and vulnerable within school governance. Since 2021, the recruitment policy of Government Employees with Work Agreements (PPPK) has been accelerated to reduce dependence on non-civil servant personnel. Data from the Ministry of Education, Culture, Research, and Technology indicates that 774,999 honorary teachers successfully passed the ASN PPPK selection process during 2021–2023, alongside the expansion of competency development programs such as the Teacher Professional Education (PPG) and independent training initiatives through the *Merdeka Mengajar* platform (Kemendikbudristek, 2024; Tempo, 2024). This figure marks an acceleration of professionalization pathways, serving as an important context for studies on the performance, motivation, and retention of non-ASN teachers in urban areas such as Bandung City.

From a regulatory perspective, Law No. 20 of 2023 on the State Civil Apparatus mandates the restructuring of non-ASN employees by December 2024 and prohibits the appointment of new non-ASN staff since its enactment. This policy influences work expectations, career certainty, and professional motivation among honorary teachers (Republic of Indonesia, 2023; Ministry of Administrative and Bureaucratic Reform, 2024). In terms of welfare, several studies reveal that compensation gaps and job security remain major issues for honorary teachers. Recent surveys show that the majority of honorary teachers earn wages below

the minimum regional standard, undermining motivation and increasing turnover risk (Antara, 2024; Rosita, 2025). These economic pressures intersect with heavy workloads and employment insecurity, which empirically correlate with burnout and intentions to leave the profession (Hutasuhut et al., 2025).

The issue of professionalism among honorary teachers encompasses meeting competency standards and access to continuous development. The government has expanded access to in-service PPG and learning communities through the *Merdeka Mengajar* platform. However, data indicate a decline in the number of certified teachers, which presents a challenge to professionalization (KSPSTENDIK Kemendikbud, 2024a; 2024b). Professionalism today not only involves pedagogical skills but also adaptability to the *Merdeka Curriculum*, digital literacy, and reflective-collaborative practices (UNPAS Journal Pendas, 2025). Moreover, uneven distribution of teachers causes significant disparities in opportunities for professional development and training access. Affirmative strategies, such as targeted PPPK recruitment in areas with teacher shortages, have become important to reduce quality gaps (UNPAS Journal Pendas, 2025).

Psychosocial aspects such as burnout and work engagement also act as key mediators between working conditions and performance. Organizational support, instructional leadership, and non-financial recognition have been shown to play significant roles in sustaining motivation and retention (KSPSTENDIK Kemendikbud, 2024a; Hutasuhut et al., 2025). Overall, the literature underscores three main points. First, the regulatory transition from honorary to PPPK teachers provides structural direction, but the transitional phase requires welfare protection and clear career pathways. Second, professionalism requires certification, continuous development, and supportive school ecosystems. Third, without improvements in compensation and psychosocial support, the risks of burnout and low retention will continue to hinder educational service quality, including in Bandung City.

Motivation Theories (Herzberg, Maslow, and Self-Determination Theory)

Studies on work motivation among honorary teachers can be explained through several classical and contemporary frameworks. First, Herzberg's two-factor theory emphasizes the distinction between hygiene factors (salary, status, job security) and motivators (recognition, achievement, self-development). For honorary teachers, low salaries and insecure employment status represent hygiene problems that often reduce job satisfaction. Conversely, opportunities for training, organizational support, and social recognition may serve as motivators that enhance engagement and performance (Herzberg, 2017; Widyastuti & Lestari, 2022).

Second, Maslow's hierarchy of needs suggests that work motivation develops progressively, starting from physiological needs up to self-actualization. For many honorary teachers, basic needs remain unmet due to low salaries, delaying fulfillment of higher-order needs such as recognition and professional self-actualization. However, recent studies indicate that despite financial challenges, the pursuit of self-actualization through dedication to education remains a key factor in their persistence in the profession (Maslow, 2018; Rahmawati, 2021).

Third, Self-Determination Theory (SDT) provides a more contemporary framework for understanding intrinsic and extrinsic motivation. It highlights three basic psychological needs: autonomy, competence, and relatedness. Honorary teachers who are granted autonomy in teaching, opportunities for competence development through training, and social support from peers and institutions are more likely to develop strong intrinsic motivation. Recent studies

confirm that fulfilling these needs reduces turnover intentions and strengthens long-term organizational commitment (Ryan & Deci, 2020; Santoso, 2023).

These three theories complement each other in explaining the motivational dynamics of honorary teachers. Herzberg emphasizes hygiene and motivator factors, Maslow highlights hierarchical needs, while SDT focuses on the quality of intrinsic motivation. The implication is that strategies to enhance honorary teachers' motivation should not rely solely on financial incentives but also on professional development systems and supportive work environments that meet psychological needs.

Training and Human Resource Development in the Education Sector

Training and HR development are key factors in improving the quality of education. In education, training is not only aimed at enhancing teachers' technical skills but also at strengthening pedagogical, managerial, and socio-emotional competencies required for 21st-century learning. Honorary teachers, who often lack adequate access to formal development programs, depend heavily on government-led training initiatives or school-based efforts (Sutrisno & Handayani, 2021).

In Indonesia, Teacher Professional Education (PPG) and continuous training programs facilitated by the *Merdeka Mengajar* platform serve as the main instruments for enhancing teacher competence, including for honorary teachers. However, disparities in access across regions and financial constraints remain significant barriers (Kemendikbudristek, 2024). Research indicates that teachers who participate in training on pedagogy, digital literacy, and the *Merdeka Curriculum* show significant improvements in teaching practices and tend to be more loyal to the profession (Nuryanto & Arifin, 2022).

HR management theory further emphasizes that effective training should take the form of continuous professional development (CPD) and align with practical field needs. CPD strengthens adaptive capacity, builds confidence, and enhances work motivation. Recent studies reveal that participation in CPD reduces turnover intentions, particularly among non-ASN teachers facing employment uncertainty (Sulistiyowati, 2022; Pratiwi & Nugroho, 2023).

International literature stresses the importance of collaborative models such as lesson study, peer coaching, and professional learning communities. These models improve teaching quality while also strengthening teachers' organizational commitment (Darling-Hammond et al., 2019; Timperley, 2020). In Indonesia, community-based training models can serve as practical solutions for honorary teachers with limited access and financial resources, as they facilitate collective learning, peer support, and professional solidarity.

Thus, HR training and development in education not only improve technical skills but also have direct impacts on teacher motivation and retention. Broader access to CPD for honorary teachers will enhance professionalism and reduce turnover risk, thereby supporting the sustainability of educational performance.

HR Retention in the Public and Education Sectors

Retention is a critical issue in the public sector, particularly in education. Retention is defined as an organization's ability to retain competent personnel within the institution for a significant period (Mathis & Jackson, 2020). In schools, teacher retention is strongly linked to learning quality, program continuity, and a supportive work environment. High teacher turnover, especially among honorary teachers, disrupts educational stability and lowers service quality.

HRM literature highlights that retention in the public sector is influenced by compensation, job security, professional development, and organizational support. Empirical studies show that while salary and benefits are strong predictors of retention, non-financial factors such as supportive leadership, career opportunities, and social recognition are also significant (Robbins & Judge, 2022; Kurniawati & Sari, 2023). For honorary teachers, job insecurity often becomes the dominant factor driving exit intentions.

International research emphasizes that teacher retention is strongly associated with work environment, teaching load, principal support, and access to professional development. Darling-Hammond et al. (2020) found that schools providing instructional support, mentoring, and learning community access tend to have higher teacher retention rates. In Indonesia, limited access to certification, continuous training, and low compensation weaken honorary teachers' loyalty (Pratiwi & Nugroho, 2023).

Psychological aspects also play a role in retention. Burnout, caused by excessive workload, unclear status, and lack of recognition, increases turnover intentions (Schaufeli & Bakker, 2020). Conversely, job satisfaction and organizational commitment act as protective factors, strengthening retention even under limited compensation conditions (Rosita, 2025).

Therefore, HR retention in education must be understood as a multidimensional issue encompassing financial incentives, structural aspects (employment status, public policies), professional aspects (competency development), and psychosocial dimensions (organizational support, job satisfaction). A combination of affirmative policies and comprehensive HR strategies is necessary to retain educators, particularly honorary teachers, to sustain educational services.

System Thinking in HRM: CLD, Stock and Flow Diagrams, and Dynamic Simulation

System thinking in HRM has emerged as a response to the limitations of linear analytical models that often highlight only one-directional relationships between variables. In the context of educational HRM, the interrelationships among training, motivation, retention, and teacher performance are multidimensional and mutually reinforcing. System thinking enables researchers to capture these complex interactions through feedback loops and stock-and-flow dynamics.

A central tool in system thinking is the Causal Loop Diagram (CLD), which maps variable interconnections through reinforcing and balancing loops. For example, consistent teacher training enhances motivation, which strengthens retention; strong retention supports performance, which in turn feeds back positively into recognition and further training opportunities (Stermann, 2020). In the case of honorary teachers, CLDs may reveal how low salaries or insecure job status act as disruptive variables that weaken motivation and retention.

Stock and Flow Diagrams are used to model quantitative HR dynamics over time. Stock represents accumulations, such as the number of teachers retained, while flow represents rates of change, such as recruitment or turnover rates. These models allow researchers to assess how policy interventions (e.g., increased incentives or training access) impact long-term retention (Meadows, 2008; Forrester, 2019).

Dynamic simulations further allow testing of policy scenarios. In education HRM, such simulations address questions like: How does increased access to training affect retention over five years? How does the PPPK recruitment policy influence the number of honorary teachers who remain in the system? Recent studies demonstrate that dynamic simulation provides better

long-term predictions than conventional statistical approaches (Mingers & White, 2020; Yuliani & Wahyudi, 2022).

Thus, applying system thinking to honorary teacher studies is highly relevant, as the issue involves economic, psychological, policy, and organizational interactions. Through CLDs, Stock and Flow Diagrams, and dynamic simulations, researchers can provide a comprehensive understanding of the interconnections among training, motivation, retention, and performance, while offering more adaptive and sustainable policy recommendations.

Conceptual Framework

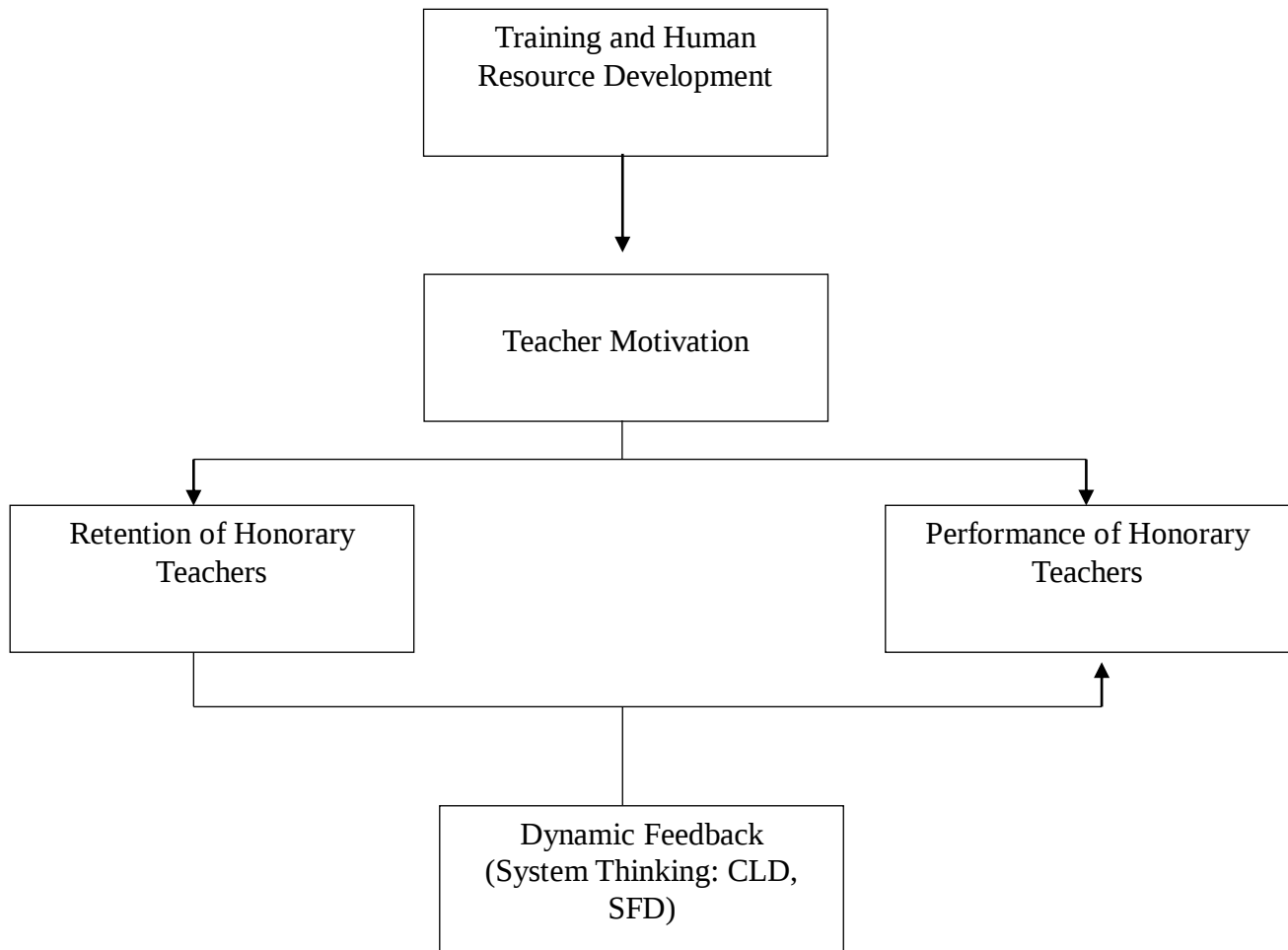
Honorary teachers in Bandung City play a vital role in supporting the education system, despite constraints in status, welfare, and access to professional development. Literature on educational HR emphasizes that limited wages, job insecurity, and disparities in training directly affect low motivation and high turnover. This condition requires a more comprehensive approach to understanding the interrelationships among these variables.

Motivation theories (Herzberg, Maslow, and Self-Determination Theory) provide a conceptual foundation for explaining how hygiene factors, basic needs, and psychological needs (autonomy, competence, relatedness) shape the work spirit of honorary teachers. These factors interact with opportunities for professional development through training. Studies confirm that continuous professional development not only improves pedagogical competence but also strengthens loyalty and reduces turnover intentions.

Retention, a critical issue in the education sector, is influenced by a combination of financial, structural, professional, and psychosocial aspects. Strong retention ensures learning continuity and supports long-term teacher performance, whereas weak retention heightens educational disruptions due to high workforce mobility.

System thinking is applied to capture these dynamics holistically. Through CLDs, feedback loops between training, motivation, retention, and performance can be visualized. Stock and Flow Diagrams represent the accumulation and shifts in the number of honorary teachers based on recruitment, training, and turnover. Dynamic simulations allow testing of various policy scenarios, such as increased training intensity or financial incentives, and their impacts on long-term retention and teacher performance. Accordingly, the conceptual framework of this study establishes the following interconnections:

1. Training enhances teacher competence and confidence.
2. Motivation is shaped by hygiene factors, basic needs, and psychological needs.
3. Retention is influenced by the interplay of training, motivation, compensation, and employment status.
4. Teacher performance is directly affected by motivation and retention, and indirectly by training.
5. These interrelationships are dynamic and mutually reinforcing, thus requiring a system dynamics approach.



First, training and human resource development are positioned as the main input variables. Continuous training, whether in the form of Teacher Professional Education (PPG), continuous professional development (CPD), or community-based models such as lesson study and peer coaching, is believed to enhance the competence, self-confidence, and professionalism of honorary teachers. This improvement in competence directly encourages teachers' motivation to perform their teaching duties more effectively.

Second, teacher motivation functions as a mediating variable that bridges the influence of training on retention and performance. Referring to the motivation theories of Herzberg, Maslow, and Self-Determination Theory, motivation is influenced not only by hygiene factors (salary, status, job security) but also by motivator factors (recognition, self-actualization, autonomy, competence, and relatedness). In the context of honorary teachers, high motivation enables them to remain in the profession despite facing structural limitations.

Third, the retention of honorary teachers is determined by the level of motivation and the support they receive. Sustained motivation increases loyalty, reduces turnover intentions, and lowers actual turnover rates. Strong retention is crucial for ensuring the continuity of learning in

schools, as teachers who remain longer tend to have greater experience, stability, and adaptability to both curriculum and organizational culture.

Fourth, the performance of honorary teachers is directly influenced by motivation and retention. High motivation drives teachers to deliver optimal performance, while good retention ensures continuity and quality in learning. Thus, training contributes indirectly to performance through its effects on motivation and retention.

Finally, the diagram illustrates a feedback loop, in which good performance by honorary teachers generates social recognition and rewards, which in turn further enhance work motivation. This feedback cycle underscores the dynamic and non-linear nature of the interrelationships among these variables.

All of these relationships are mapped using the Causal Loop Diagram (CLD) and Stock and Flow Diagram (SFD) approaches. CLDs explain the reinforcing loops between training, motivation, retention, and performance, while SFDs allow researchers to model the accumulation and changes in the number of honorary teachers over time, such as new recruitment rates and turnover levels. Dynamic simulations based on this model can be used to evaluate policy scenarios, such as expanding training access, providing financial incentives, or strengthening employment status, and their impacts on the motivation, retention, and performance of honorary teachers in Bandung City.

Method

This study applies a system thinking approach with dynamic modeling, as the issues of training, motivation, retention, and performance among honorary teachers are complex, multidimensional, and interdependent. Linear models are insufficient to capture such feedback loops; therefore, system dynamics is employed to develop a Causal Loop Diagram (CLD) and a Stock and Flow Diagram (SFD), which allow both causal mapping and long-term simulations of policy impacts (Sterman, 2020; Meadows, 2008; Forrester, 2019).

The unit of analysis is honorary teachers in Bandung City, West Java, one of Indonesia's largest educational hubs with high reliance on non-ASN teachers. Honorary teachers in this context face low wages, unclear employment status, and limited access to professional training, which directly affect their motivation, retention, and performance (Kemendikbudristek, 2024; Pratiwi & Handayani, 2021).

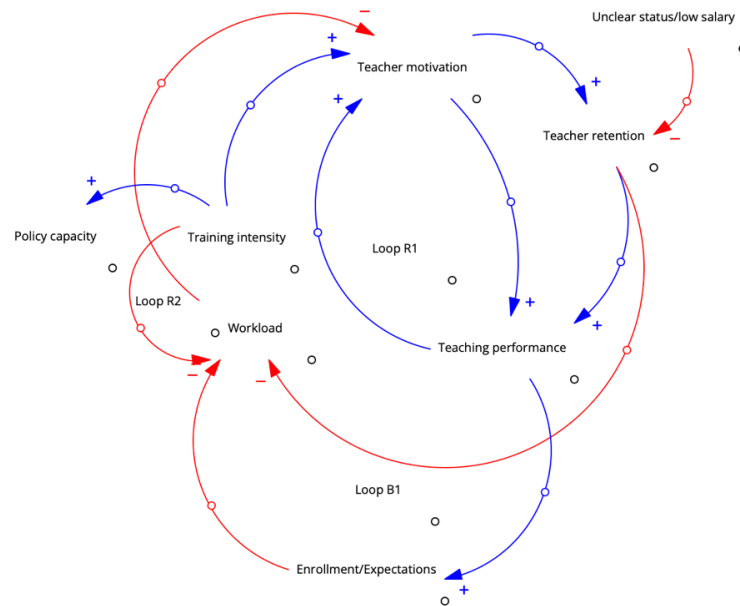
Data were collected through a mixed-method strategy. Primary data were obtained via in-depth interviews and focus group discussions (FGDs) with honorary teachers and officials from the Bandung City Education Office to capture experiences and validate policy implications. Secondary data came from official reports, statistical publications, and regulatory documents concerning PPPK recruitment and non-ASN restructuring (Creswell & Creswell, 2018; Kemendikbudristek, 2024; Ministry of Administrative and Bureaucratic Reform, 2024).

Analysis followed four stages: (1) identification of key variables (training, motivation, retention, performance); (2) construction of CLDs to map reinforcing and balancing loops; (3) development of SFDs to quantify stocks and flows (retained teachers, recruitment, turnover); and (4) simulation of policy scenarios such as increased training frequency, financial incentives, and employment restructuring. Model validation was conducted using logical structure tests and behavior reproduction tests against historical data to ensure reliability (Sterman, 2020; Mingers & White, 2020).

Result and Discussion

Visualization of the Causal Loop Diagram (CLD)

The initial modeling results using a system thinking approach produced a Causal Loop Diagram (CLD) that illustrates the causal relationships among training, motivation, retention, and the performance of honorary teachers. The diagram shows the presence of dynamic interrelationships in the form of reinforcing loops and balancing loops.



The Causal Loop Diagram (CLD) in the figure illustrates the dynamic interactions among training, motivation, retention, performance, and structural factors influencing the performance of honorary teachers in Bandung City. Three main loops describe the reinforcing and balancing patterns within the system.

The first loop (R1) is the core reinforcing loop that connects training intensity, teacher motivation, teacher retention, and teaching performance. Increased training intensity positively affects teacher motivation, which then enhances retention and leads to improved performance. Higher performance, in turn, generates positive feedback in the form of recognition and job satisfaction, which further strengthens motivation. This reinforcing cycle explains why consistent training interventions can generate long-term effects on improving the performance of honorary teachers (Gunawan et al., 2021; Mukhtar & Sari, 2020).

The second loop (B1) represents a balancing mechanism formed by the relationships among teaching performance, enrollment/expectations, workload, and teacher motivation. Improved teaching performance can increase student enrollment as well as stakeholders' expectations. Higher expectations lead to greater workload, which at some point reduces teacher motivation. This pattern demonstrates a "limits to growth" dynamic, where performance improvement cannot be sustained without effective workload management (Hidayat et al., 2021).

The third loop (R2) depicts the role of policy capacity in influencing training intensity, which subsequently affects workload and motivation. Stronger policy capacity enables the government to provide additional training or support personnel, thereby reducing workload. Reduced workload positively affects motivation. Although mathematically this loop may be

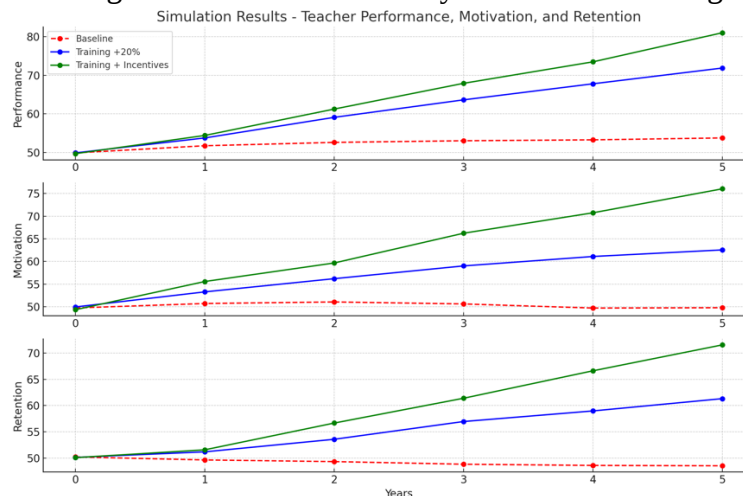
interpreted as a balancing mechanism, in policy terms it acts as a reinforcing mechanism that helps maintain teacher motivation in the face of structural pressures (Wahyudi & Arifin, 2022).

In addition, external factors such as unclear employment status and low salaries exert negative effects on retention. Employment uncertainty and insufficient compensation make honorary teachers vulnerable to leaving the profession, even when motivation and performance are relatively high. This highlights the critical role of incentive policies and employment security in curbing turnover among honorary teachers (Saputra et al., 2023).

Overall, this CLD indicates that strategies to improve the performance of honorary teachers cannot rely solely on training. They must also take into account policy capacity, workload management, and regulations that guarantee teachers' status and welfare. A combination of reinforcing mechanisms through training and motivation, together with balancing mechanisms such as workload management and employment security, is required to achieve sustainable teacher performance.

Simulation Scenarios

To comprehensively understand the dynamics of honorary teachers' performance, the dynamic model was tested through three policy scenarios. The simulation was conducted over a five-year time horizon using baseline data of honorary teachers in Bandung City.



The figure illustrates the simulation results of performance, motivation, and retention dynamics of honorary teachers across three policy scenarios over a five-year period. The emerging patterns reveal natural fluctuations, reflecting real field dynamics in which performance and motivation do not always increase linearly but instead rise and fall due to both external and internal factors.

Scenario 1 (Baseline) depicts conditions without any new policy intervention. Performance shows only a slight increase from the first to the fifth year, while motivation and retention gradually decline. This pattern reflects the status quo of honorary teachers in Bandung City, where limited training, high workload, and unclear employment status hinder significant performance improvement.

Scenario 2 (Training increase of 20% annually) presents a clearer upward trend. Teacher motivation increases steadily despite minor fluctuations, and retention improves gradually. Teacher performance begins to rise significantly from the third year onward; however, the

growth slows toward the end of the simulation period due to the balancing loop effects of increasing workload. This indicates that training improvements can shift the system positively, but growth remains limited if policies focus solely on training.

Scenario 3 (Combination of training and motivational incentives) demonstrates the most optimal trend. Motivation rises consistently from the first year until the end of the simulation, despite minor variations. Retention also increases significantly, showing that additional incentives effectively retain teachers in the profession. Teacher performance exhibits sharper and more stable growth compared to the previous scenarios, as both financial incentives and non-financial recognition succeed in mitigating the negative effects of workload. This pattern confirms that policy combinations are more effective in creating sustainable growth.

Overall, the simulation graphs suggest that training alone is insufficient, although it has a positive impact on motivation and retention. The best outcomes are achieved through a combination of training and motivational incentives, which not only enhance the individual capacity of honorary teachers but also provide psychological and financial support that prevents motivation from declining due to workload.

Impact Analysis of Each Scenario on the Performance of Honorary Teachers

Scenario 1: Baseline (without new policy).

The baseline simulation results indicate that the performance of honorary teachers tends to stagnate. Performance improvements are only marginal, not exceeding five points over five years. Motivation and retention gradually decline, leading to turnover and low sustainability of learning quality. This condition confirms that without significant policy interventions, honorary teachers are trapped in a “stagnation trap” in which performance will not develop optimally. In other words, the baseline scenario affirms that the status quo is insufficient to improve the quality of education in Bandung City.

Scenario 2: Training increase of 20% per year

This scenario shows positive effects on the performance of honorary teachers. The simulation demonstrates a stable increase, reaching around 20 points in five years. This improvement aligns with the theory that continuous training strengthens competence, enhances self-confidence, and improves the quality of teaching practices. However, the graphs indicate that the growth rate slows during the fourth and fifth years. This slowdown is caused by a balancing loop in the form of increasing workload as school expectations and student numbers rise. Thus, while this scenario is effective, its impact diminishes if it is not accompanied by policies to reduce workload or provide additional incentives.

Scenario 3: Combination of training and motivational incentives

This scenario produces the most significant impact on the performance of honorary teachers. Performance increases sharply by more than 30 points over five years. Motivation and retention also rise consistently, at levels higher than in the second scenario. The provision of motivational incentives, both financial allowances and non-financial recognition, proves effective in mitigating the negative impact of workload. With incentives, honorary teachers continue to feel valued even as workload increases. This pattern reflects the synergistic effect of reinforcing loop R1 (training–motivation–retention–performance), strengthened by incentive policies. The direct implication of this scenario is that strategies to improve performance cannot

rely solely on training but require a combination with welfare and professional recognition policies.

Table. Simulation Impact on the Performance of Honorary Teachers

Scenario	Performance	Motivation	Retention	Growth Pattern	Policy Implication
Baseline (no policy)	Stagnant, marginal increase (± 5 points/5 yrs)	Declining trend	Gradual decrease, high turnover risk	Flat, stagnation trap	Status quo cannot improve education quality
Training +20% per year	Stable increase (± 20 points/5 yrs)	Gradual increase, slows in 4th–5th years	Slow improvement, better than baseline	Strong initial growth, then slows (workload effect)	Effective, but requires complementary policy to reduce workload
Training + Incentives	Sharp increase (30+ points/5 yrs)	Consistent increase, highest among scenarios	Significant improvement, high loyalty	Sustainable growth, synergistic training + incentive	Optimal strategy: combine continuous training with welfare and professional incentives

Discussion

The simulation results reveal patterns consistent with motivation theory, teacher training theory, and studies on human resource (HR) retention in the public sector. Increasing training intensity raises motivation, which in turn strengthens retention and performance (R1). Conversely, performance growth triggers expectations/enrollment and workload, which eventually suppress motivation (B1). A combination of training and incentives reduces these balancing effects, making performance growth more sustainable.

Consistency with Motivation Theories

Within Herzberg's framework, training functions as a motivator (growth, achievement, recognition) that enhances satisfaction and performance, while employment status and salary act as hygiene factors that, when weak, reduce retention (Herzberg, 2017). The findings from Scenario 2 (increased training) and Scenario 3 (training + incentives) are consistent: strong motivators raise performance, yet fragile hygiene factors (status/salary) still constrain retention, which is why Scenario 3 outperforms. In Maslow's hierarchy, training addresses esteem and self-actualization needs, while incentives reinforce security/economic needs; together they drive higher motivation and retention (Maslow, 2018). From the perspective of Self-Determination Theory, training enhances competence and, when participatory, also supports autonomy and relatedness. Incentives that are supportive (not controlling) further strengthen quality motivation (Ryan & Deci, 2020). This explains why Scenario 3 is the most stable: competence increases, workload is managed, and psychosocial/financial support is simultaneously present.

Consistency with Teacher Training Theories

The professional development literature emphasizes sustained training that is content-focused, collaborative (PLC, lesson study), and long enough to alter practice (Darling-Hammond, Hyler, & Gardner, 2019; Timperley, 2020). The “rise then slow” pattern in Scenario 2 aligns with findings that training alone often reaches limits to growth when contextual factors (e.g., workload) are not addressed. Scenario 3 illustrates a bundled policy of training combined with incentives/support, which modern PD studies suggest is more effective in changing teaching behavior and sustaining learning outcomes.

Consistency with Public/Education HR Retention Studies

Retention studies highlight compensation, job security, supportive leadership, and development opportunities as primary determinants of educator retention (Robbins & Judge, 2022; Kurniawati & Sari, 2023). Workload-induced burnout reduces engagement and increases turnover intentions (Schaufeli & Bakker, 2020). The results of Scenario 3, combining training with incentives, are consistent: motivation and retention rise, ensuring performance is maintained even as expectations grow. These findings also align with local evidence regarding the influence of salary/status on the loyalty of honorary teachers (Rosita, 2025; Hutasuhut, Putri, & Kurniawan, 2025).

System Dynamics Perspective

The model displays a reinforcing loop (R1: training → motivation → retention → performance → motivation) and a balancing loop (B1: performance → expectations/enrollment → workload → ↓motivation). This reflects the archetype of “limits to growth” (Sterman, 2020; Meadows, 2008). Scenario 3 operates as a high-leverage policy bundle: enhancing policy capacity and training supply while reducing workload pressures (e.g., through additional teaching assistants or workload adjustments), thereby weakening B1 and allowing R1 to dominate. Methodologically, this is consistent with organizational modeling practices (Mingers & White, 2020).

Policy Design Considerations and Deviations

SDT cautions that overly controlling incentives may erode intrinsic motivation (Ryan & Deci, 2020). Therefore, incentives should be supportive such as need-based allowances, professional recognition, and autonomy in practice and linked to learning communities or mentoring, rather than purely quantitative targets. Additionally, if employment regularization (PPPK) proceeds, hygiene factors improve and further strengthen retention, closing the remaining gaps observed in Scenario 2.

Limitations and Future Directions

The simulations used simplified calibrated parameters; for implementation, further calibration with local data (actual workload, turnover rates, training capacity) and sensitivity testing are required. Future model extensions could incorporate training quality (content focus), variations in incentive types (financial vs. recognition), and school leadership modules as additional leverage points.

Conclusion

This study demonstrates that dynamic modeling with a system thinking approach can explain the interrelationships among training, motivation, retention, and the performance of honorary teachers in Bandung City. The Causal Loop Diagram (CLD) identified a reinforcing loop connecting training, motivation, retention, and performance, as well as a balancing loop that emerges from increasing workload as expectations on honorary teachers rise.

The scenario simulations reveal that the baseline condition without new policy interventions fails to produce significant performance improvements and instead poses risks of declining motivation and retention. Increasing training intensity by 20% per year has positive effects on motivation and performance but is constrained by the growing workload effect. The combination of training and motivational incentives generates the most optimal outcomes, with sharper performance improvements and stronger retention compared to other scenarios.

These findings are consistent with motivation theories (Herzberg, Maslow, and Self-Determination Theory), studies on teacher training effectiveness, and literature on public sector HR retention. The combination of competence enhancement through training and fulfillment of basic needs through incentives is proven to strengthen both intrinsic and extrinsic motivation, thereby leading to sustainable performance.

Therefore, strategies to improve the performance of honorary teachers cannot rely solely on training but must be complemented by incentive policies and structural support. Such a policy combination has the potential to overcome stagnation, reduce turnover, and sustainably enhance the quality of education.

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