

The Effect of Workload and Work-Life Balance on Teacher Performance with Gemini AI Utilization as a Mediating Variable

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ABSTRACT

This study examines the effect of workload and work-life balance on teacher performance, and tests the mediating role of Gemini AI utilization. The sample consisted of 250 teachers from schools registered as Google Reference School Candidates (KSRG) across Indonesia, selected using purposive sampling followed by proportional random sampling. The instrument was developed from indicators of workload, work-life balance, Gemini AI utilization, and teacher performance, measured on a five-point Likert scale. Data were analyzed using Partial Least Squares-Structural Equation Modeling (PLS-SEM). The findings show that workload has a positive and significant effect on Gemini AI utilization but a negative and significant effect on teacher performance, work-life balance has a positive and significant effect on both Gemini AI utilization and teacher performance, and Gemini AI utilization has a positive and significant effect on teacher performance. Gemini AI utilization also significantly mediates the effect of workload (competitive mediation) and work-life balance (complementary mediation) on teacher performance. Managerially, KSRG school management should keep teachers' workload proportional, strengthen work-life balance policies, and provide structured training so that Gemini AI can be optimally integrated into teachers' daily instructional and administrative tasks.

INTRODUCTION

One of the priorities of human resource development in education is preparing teachers to face the rapid digital transformation now reshaping schools worldwide. Entering the Society 5.0 era, educational institutions are required to integrate technology with human needs so that the educational process is no longer oriented solely toward knowledge transfer, but also toward developing adaptive competence, creativity, and the capacity to make optimal use of technology (Atay et al., 2025). Digital transformation has reshaped learning systems, school governance, and the professionalism demanded of teachers (McCarthy et al., 2023). Teachers, as the main actors in the education process, are now required not only to teach, but also to develop technology-based learning, produce digital learning content, conduct data-based evaluation, and manage various educational administration activities (McCarthy et al., 2023).

This expansion of roles has increased the complexity of teachers' work. Beyond their core teaching function, teachers today face additional demands such as preparing lesson materials, managing academic administration, reporting performance, operating various digital platforms, and continuously adapting to new educational technologies. This condition drives an increase in teacher workload, particularly workload originating from administrative and non-instructional tasks, which in turn has the potential to reduce the time, energy, and cognitive resources teachers can devote to their professional duties. This phenomenon is well explained through Conservation of Resources (COR) Theory, proposed by Hobfoll, (1989), which states that individuals experience psychological strain when facing conditions that threaten the loss of resources they possess, whether time, energy, cognitive capacity, or psychological resources.

In the context of teaching, rising administrative demands and the digitalization of education can erode the personal resources needed to sustain the quality of task performance, and if this condition persists, it can affect teachers' ability to achieve optimal performance (Hobfoll et al., 2018). In addition to workload, teachers' ability to maintain a balance between work life and personal life, known as work-life balance, is an important factor that supports the successful execution of professional duties. Work-life balance describes an individual's ability to manage the demands of work and personal life in a balanced manner (Kibambila, 2026). When work demands increase without being matched by adequate resource management, individuals risk experiencing role conflict, which can reduce recovery time, increase psychological pressure, and diminish the ability to carry out professional activities optimally.

In Indonesia, technology-based education transformation continues to be promoted through various digitalization initiatives, one of which is the Google Reference School Candidate (KSRG) program. KSRG is a school ecosystem that promotes the use of Google Workspace for Education to support learning, collaboration, communication, and the management of school administration (KSRG Indonesia, 2024). Schools that have joined KSRG have a relatively higher level of technology readiness compared to schools in general, as they are already accustomed to using various digital tools and platforms in their daily educational activities (Kibambila, 2026). However, this technological readiness has not fully eliminated the problem of teacher workload.

Digitalization can indeed improve efficiency, but on the other hand it can also create new demands, as teachers must manage various digital platforms, produce learning content, adapt to technological change, and understand digital-based administrative systems (Khoirunnisa et al., 2025). Studies on teachers' digital burden confirm that the use of various educational platforms has not fully reduced teachers' workload; in a number of conditions it instead adds administrative activity in the form of intensive document management, periodic data updates, and the completion of digital work outside formal working hours (Hilhamsyah

et al., 2024). The problem of teachers' administrative burden has also drawn government attention.

The Directorate of Basic and Secondary Education Teachers reformed teacher performance management by simplifying the administrative process, in response to input from teachers, principals, and school supervisors calling for a reduction of administrative burden so that teachers could focus more on instructional activities. A preliminary survey of 60 teachers within the KSRG environment reinforced this picture: most respondents reported frequently completing school work outside formal working hours, needing high concentration to manage multiple pieces of information and learning activities simultaneously, and experiencing pressure when facing several work demands at once. These preliminary findings indicate that teacher workload is related not only to the quantity of work, but also to mental demands, time pressure, responsibility for work outcomes, and emotional strain.

In response to these rising work demands, generative Artificial Intelligence has begun to emerge as a strategic solution supporting teachers' work. One generative AI technology with substantial potential in education is Gemini AI, which can help teachers prepare learning materials, produce documents, develop assessments, provide feedback, process information, and complete administrative tasks. A preliminary survey of KSRG teachers showed a positive perception of Gemini AI's potential to accelerate administrative work, increase work productivity, and encourage continued use. This finding is consistent with a report by Google Indonesia, (2024) through the Gemini Academy program, which found that most participating teachers acknowledged the technology helped ease their workload and increased their confidence in preparing classroom materials.

ANTARA News, (2025) further reported that AI utilization in education can increase teacher productivity through automated quiz generation and learning outcome analysis. Evidence from international education institutions shows a similar pattern; Google for Education, (2025) reported that the use of Gemini at Albuquerque Public Schools helped teachers prepare lesson plans, teaching materials, and administrative activities, even substantially cutting the time needed to draft weekly lesson plans. The effectiveness of Gemini AI in improving teacher performance nonetheless requires further empirical examination, because AI technology needs to be understood not only in terms of technology acceptance or its direct benefits, but also as a mechanism that bridges the relationship between work demands and teachers' work outcomes.

From the perspective of Task-Technology Fit (TTF) Theory, proposed by Suryani & Sumiyana, (2015), the benefit of technology for individual performance is determined by the extent to which the technology's capability fits the characteristics of the user's task. Accordingly, appropriate utilization of Gemini AI can serve as an external resource that helps teachers preserve their personal resources by reducing the time, energy, and cognitive load required to complete their work, which is consistent with the logic of COR Theory. Research on the factors influencing teacher performance has developed from various perspectives.

Karina et al., (2025), through a literature review, found that work-life balance contributes to improved teacher performance through individuals' ability to manage time, engagement, and satisfaction between work and personal life.

Hanjaya et al., (2025) reinforced this finding by demonstrating that work-life balance has a positive effect on teacher performance and also strengthens digital adaptability as a supporting mechanism for performance. From a technology-adoption perspective, Arbab et al., (2025) found that artificial intelligence plays a significant role in mediating the relationship between work dynamics and employees' work-life balance. However, research on AI utilization in education still largely focuses on general technology acceptance; Imran & Almusharraf, (2024), for instance, described the potential of Google Gemini in supporting teachers' activities, but their study remained conceptual and did not empirically test the relationship between Gemini AI utilization and teachers' work factors and performance.

Based on this review, a research gap is identified regarding the mechanism by which generative AI technology bridges the relationship between teachers' work factors and improved performance. Previous studies have tended to examine the direct relationship between workload or work-life balance and performance, or to examine AI solely from a technology-acceptance perspective, so that few studies have integrated workload, work-life balance, Gemini AI utilization as a mediating variable, and teacher performance within a single empirical model, particularly in the context of schools that already possess digital transformation readiness such as KSRG.

This study offers several elements of novelty: (1) it develops an empirical model integrating human resource management and educational technology perspectives; (2) it positions Gemini AI as a mediating variable, differing from prior studies that more often used conventional information systems as an intervening variable; (3) it selects teachers within the KSRG environment as the research object, a setting with relatively high technology readiness; and (4) it offers a methodological contribution by testing both direct and indirect relationships among variables using a mediation-analysis approach based on PLS-SEM.

The objectives of this study are to: (1) test the effect of workload on Gemini AI utilization; (2) test the effect of work-life balance on Gemini AI utilization; (3) test the effect of workload on teacher performance; (4) test the effect of work-life balance on teacher performance; (5) test the effect of Gemini AI utilization on teacher performance; (6) test the mediating role of Gemini AI utilization in the effect of workload on teacher performance; and (7) test the mediating role of Gemini AI utilization in the effect of work-life balance on teacher performance. By answering these seven objectives, this study is expected to provide theoretical contributions in the form of empirical testing of a mediation model in a new context (KSRG) and practical contributions in the form of recommendations for improving teacher performance based on proportional workload management, work-life balance, and appropriate generative AI integration.

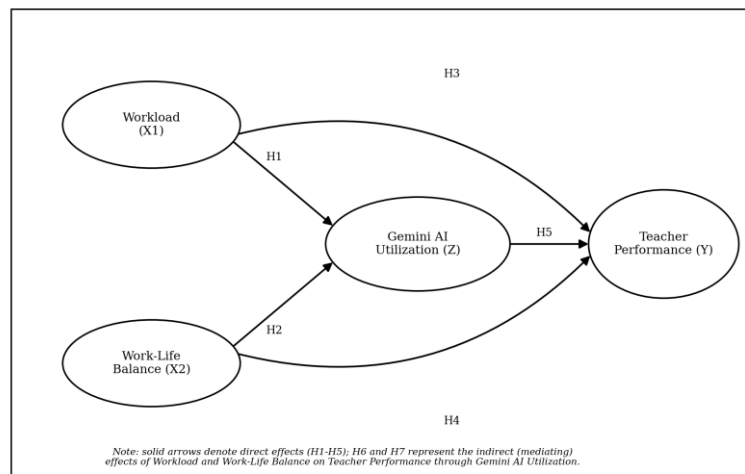


Figure 1. Research Model

- H1. Workload has a positive and significant effect on Gemini AI utilization.
- H2. Work-life balance has a positive and significant effect on Gemini AI utilization.
- H3. Workload has a significant effect on teacher performance.
- H4. Work-life balance has a positive and significant effect on teacher performance.
- H5. Gemini AI utilization has a positive and significant effect on teacher performance.
- H6. Gemini AI utilization significantly mediates the effect of workload on teacher performance.
- H7. Gemini AI utilization significantly mediates the effect of work-life balance on teacher performance.

RESEARCH METHODS

This study used a quantitative approach with a descriptive and verificative (explanatory) design. The descriptive approach was used to profile respondent characteristics and to describe the distribution of questionnaire responses on each dimension of the research variables using central tendency measures, while the verificative approach was designed to test the hypotheses and evaluate the direction and significance of the causal relationships among variables using Structural Equation Modeling based on Partial Least Squares (PLS-SEM) (Slater & Hasson, 2025). The object of this study is the relationship between Workload (X1) and Work-Life Balance (X2) as exogenous variables, Teacher Performance (Y) as the endogenous variable, and Gemini AI Utilization (Z) as the mediating variable. The unit of analysis was primary and secondary schools in Indonesia registered as Google Reference School Candidates (KSRG), while the unit of observation was active teachers at these schools who have interacted with Google Workspace for Education and have access to Gemini AI features (KSRG Indonesia, 2024). The study population consisted of 491 active teachers spread across 20 KSRG schools in 9 provinces of Indonesia (KSRG, 2024), as presented in Table 1.

Table 1. Population and sample distribution by province

Province	Population	Sample
East Java	176	90
Central Java	15	8
DI Yogyakarta	42	21
Bali	40	20
East Kalimantan	84	43
South Kalimantan	45	22
Central Sulawesi	25	13
Southeast Sulawesi	13	7
Bangka Belitung Islands	38	19
Total	491	250

Source: KSRG Indonesia (2024); Portal Data Pendidikan (2026), reprocessed.

The minimum sample size was determined using the Slovin formula with a 5% error margin, $n = N / (1 + Ne^2)$, which produced a minimum estimated sample of 221 respondents from the population of 491 teachers. Because this study applies PLS-SEM, which requires a sufficient number of observations for stable parameter estimation (Ismail et al., 2022), the sample size was set above this minimum, at 250 teacher respondents, to increase the stability of model estimation and to anticipate incomplete data. The sampling technique was non-probability sampling, using purposive sampling followed by proportional random sampling, with the following inclusion criteria: (a) active teachers at KSRG-status schools; (b) at least one academic year of service; and (c) prior access to or use of Google Workspace and Gemini AI, so that respondents were able to provide a relevant assessment of the research variables.

The research data are primary data obtained through a closed-ended questionnaire survey measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) (Sugiyono, 2019). The instrument was developed from established indicators of workload (physical, mental, and temporal demands, perceived risk, and frustration level), work-life balance (work-personal life interference and enhancement), Gemini AI utilization (perceived usefulness, ease of use, and usage intensity), and teacher performance (quantity of work, promptness, initiative, capability, and communication). Before the instrument was distributed to the 250 main respondents, a pilot test was conducted with 30 respondents outside the main sample to test validity through item-total correlation (r-count compared with an r-table of 0.361 at a 5% significance level) and reliability through Cronbach's Alpha, which confirmed that all items were valid and reliable for use in the main data collection stage.

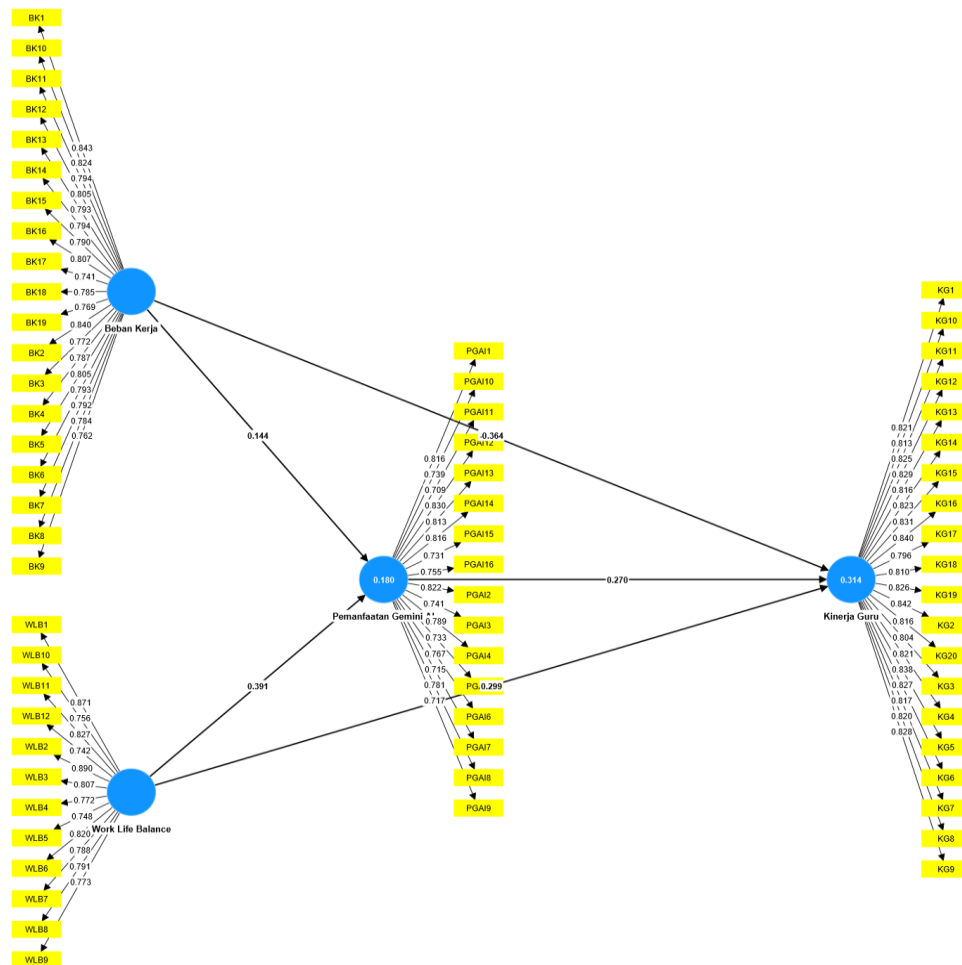


Figure 2. Outer Model dan Inner Model

Sumber: Data Primer Diolah dengan SmartPLS (2026)

Data analysis used the PLS-SEM approach, comprising the evaluation of the measurement model (outer model) and the structural model (inner model) (Nguyen et al., 2022). Outer model evaluation covered convergent validity (outer loading > 0.70 and Average Variance Extracted/AVE > 0.50), discriminant validity (Heterotrait-Monotrait Ratio/HTMT < 0.90) (Azizah & Hidayatullah, 2025), and construct reliability through composite reliability and Cronbach's Alpha (> 0.70). Inner model evaluation covered the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f-square) (Rahaman et al., 2022), and the Goodness of Fit (GoF) index. Hypothesis testing was conducted through a bootstrapping procedure, with a hypothesis accepted if the t-statistics exceeded 1.96 and the p-values were below 0.05 at a 5% significance level.

RESULTS AND DISCUSSION

Results

Respondent Identity

Respondent characteristics are an important part of this study because they describe the profile of KSRG teachers who served as the research subjects, while also strengthening the empirical context for analyzing the effect of workload and work-life balance on teacher performance with Gemini AI utilization as a mediating variable. Respondent identity is described based on gender, age, last education, teaching tenure, school level, and experience using Gemini AI.

Tabel 2. Respondent identity

Respondent Identity	Category	Frequency	Percentage
Gender	Male	85	34.0
	Female	165	66.0
	Total	250	100.0
Age	≤ 30 years	38	15.0
	31–40 years	95	38.0
	41–50 years	78	31.0
	> 50 years	39	16.0
	Total	250	100.0
Last education	Diploma	9	4.0
	Bachelor's degree	183	73.0
	Master's degree	55	22.0
	Doctoral degree	3	1.0
	Total	250	100.0
Teaching tenure	≤ 2 years	39	16.0
	3–5 years	54	22.0
	6–10 years	82	33.0
	> 10 years	75	30.0
	Total	250	100.0
School level	Elementary school	21	8.0
	Junior high school	189	76.0
	Senior high school	40	16.0
	Total	250	100.0
Gemini AI experience	Ever used Gemini AI	250	100.0
	Never used Gemini AI	0	0.0
	Total	250	100.0

Respondent Identity	Category	Frequency	Percentage
Frequency of use	Frequently	147	59.0
	Rarely	103	41.0
	Total	250	100.0

Source: primary data processed (2026).

Based on Table 2, respondents were dominated by female teachers (66.0%) compared to male teachers (34.0%). By age, the 31-40-year group was the largest (38.0%), followed by 41-50 years (31.0%), over 50 years (16.0%), and 30 years or below (15.0%). By last education, most respondents held a bachelor's degree (73.0%), followed by a master's degree (22.0%), diploma (4.0%), and doctoral degree (1.0%). By teaching tenure, the 6-10-year group was the largest (33.0%), followed by more than 10 years (30.0%), 3-5 years (22.0%), and 2 years or below (16.0%). By school level, most respondents taught at the junior high school level (76.0%), followed by senior high school (16.0%) and elementary school (8.0%). All respondents (100.0%) reported having used Gemini AI, with 59.0% reporting frequent use and 41.0% reporting infrequent use. This profile confirms that respondents met the inclusion criteria and had relevant, first-hand experience to assess the Gemini AI utilization variable.

Measurement Model/Outer Model Assessment

Evaluation of the outer model was carried out to assess the outer loading, validity, and reliability of the indicators and constructs studied, covering convergent validity and discriminant validity (Tambunan et al., 2024). Prior to the main survey, instrument validity was tested on 30 pilot respondents through item-total correlation, producing r-count values between 0.709 and 0.899, all of which exceeded the r-table value of 0.361, so that all items were declared valid. Instrument reliability at the pilot stage also showed high Cronbach's Alpha values for Workload (0.975), Work-Life Balance (0.953), Gemini AI Utilization (0.967), and Teacher Performance (0.974). At the PLS-SEM stage, the convergent validity results show that all reflective indicators across the four constructs had outer loading values above the 0.70 threshold, so that no indicators required elimination. Composite reliability and Cronbach's Alpha for every construct also exceeded the minimum limit of 0.70, confirming excellent internal consistency, and the AVE value of every construct exceeded 0.50, confirming that each construct explains more than 50% of the variance in its indicators. A summary of the outer model evaluation is presented in Table 3.

Table 3. Summary of outer model evaluation (outer loading range, composite reliability, Cronbach's Alpha, AVE)

Variable	Items	Outer Loading Range	Composite Reliability	Cronbach's Alpha	AVE
Workload	19	0.741-0.843	0.970	0.967	0.631
Work-Life Balance	12	0.742-0.890	0.955	0.948	0.640

Variable	Items	Outer Loading Range	Composite Reliability	Cronbach's Alpha	AVE
Gemini AI Utilization	16	0.709-0.830	0.958	0.953	0.590
Teacher Performance	20	0.796-0.842	0.977	0.975	0.676

Source: primary data processed (2026).

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT), which is considered more sensitive in detecting discriminant validity issues than the traditional Fornell-Larcker approach and is increasingly recommended for PLS-SEM analysis (Henseler et al., 2015). A construct is declared to have adequate discriminant validity if its HTMT value with other constructs is below 0.90. The results of the HTMT test are presented in Table 4.

Table 4. Discriminant validity: Heterotrait-Monotrait Ratio (HTMT)

Construct Relationship	HTMT
Teacher Performance <-> Workload	0.300
Gemini AI Utilization <-> Workload	0.175
Gemini AI Utilization <-> Teacher Performance	0.339
Work-Life Balance <-> Workload	0.080
Work-Life Balance <-> Teacher Performance	0.395
Work-Life Balance <-> Gemini AI Utilization	0.411

Source: primary data processed (2026).

Based on Table 4, all HTMT values between constructs are below the recommended threshold of 0.90, ranging from 0.080 to 0.411. This indicates that there is no excessive construct overlap, so that Workload, Work-Life Balance, Gemini AI Utilization, and Teacher Performance can be empirically differentiated from one another. Taken together with the convergent validity and reliability results in Table 3, the measurement model is declared feasible to proceed to structural model evaluation.

Structural Model/Inner Model Assessment

Structural model assessment was conducted to evaluate the quality of the relationships between constructs through the coefficient of determination (R^2), predictive relevance (Q^2), effect size (f -square), and the significance of the path coefficients. The coefficient of determination (R^2) indicates the ability of the exogenous variables to explain the endogenous variables, with R^2 values of 0.75, 0.50, and 0.25 indicating substantial, moderate, and weak levels of explanation, respectively (Gao, 2023). Predictive relevance (Q^2), obtained through the blindfolding procedure, indicates the model's predictive ability, with a Q^2 value above zero indicating adequate predictive relevance. The results of the R^2 and Q^2 analysis are presented in Table 5.

Table 5. Coefficient of determination (R^2) and predictive relevance (Q^2)

Variable	R Square	Q Square
Teacher Performance	0.314	0.638
Gemini AI Utilization	0.180	0.533

Source: primary data processed (2026).

Based on Table 5, the Teacher Performance variable has an R^2 value of 0.314, indicating that 31.4% of the variation in teacher performance can be explained by Workload, Work-Life Balance, and Gemini AI Utilization, while the remaining 68.6% is explained by factors outside the model. The Gemini AI Utilization variable has an R^2 value of 0.180, indicating that 18.0% of its variation is explained by Workload and Work-Life Balance. Both Q^2 values are well above zero, indicating that the model has adequate predictive relevance, with the strongest predictive power for Teacher Performance. The f-square test further shows that Workload has a medium effect size on Teacher Performance ($f^2 = 0.188$) and Work-Life Balance has a medium effect size on Gemini AI Utilization ($f^2 = 0.186$), while the remaining paths fall into the small effect-size category ($f^2 = 0.025-0.109$) (Rotama & Santoso, 2026). After the measurement and structural models were declared feasible, hypothesis testing was carried out to determine the significance of the direct and indirect relationships among the study variables. Hypothesis decisions are based on path coefficients, t-statistics, and p-values, with a relationship declared significant if the t-statistics exceed 1.96 and the p-values are below 0.05. The results of the path coefficient significance tests are presented in Table 6 and Figure 2.

Table 6. Hypothesis testing of direct and mediation effects

Relationship between Variables	B	T Statistics	P Values	Decision
Workload -> Gemini AI Utilization	0.144	2.263	0.024	H1 Accepted
Work-Life Balance -> Gemini AI Utilization	0.391	7.227	0.000	H2 Accepted
Workload -> Teacher Performance	-0.364	7.232	0.000	H3 Accepted
Work-Life Balance -> Teacher Performance	0.299	5.281	0.000	H4 Accepted
Gemini AI Utilization -> Teacher Performance	0.270	4.972	0.000	H5 Accepted
Workload -> Gemini AI Utilization -> Teacher Performance	0.039	2.108	0.035	H6 Accepted
Work-Life Balance -> Gemini AI Utilization -> Teacher Performance	0.106	4.111	0.000	H7 Accepted

Source: primary data processed (2026).

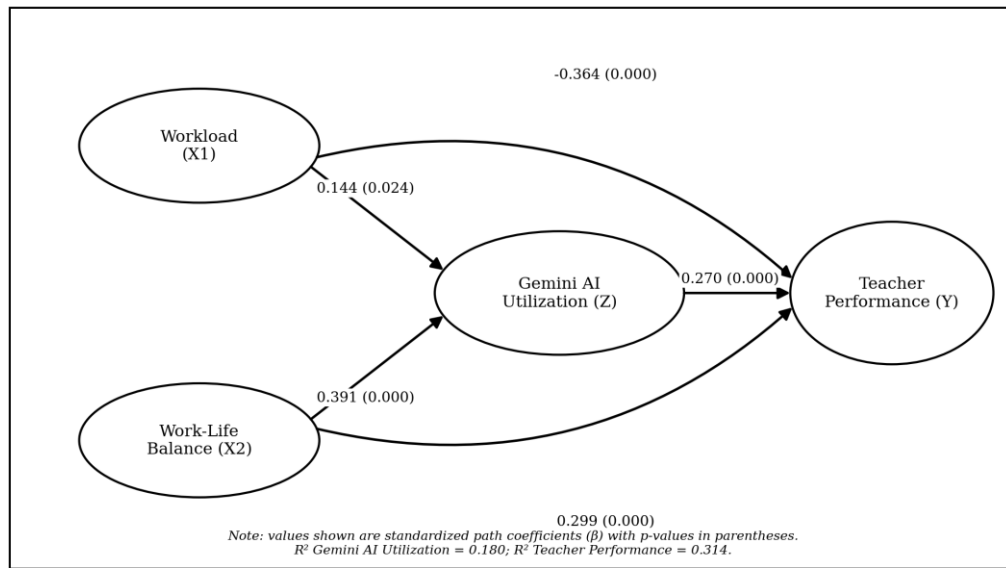


Figure 3. Structural model of hypothesis testing results

Based on Table 6, the test results show that Workload has a positive and significant effect on Gemini AI Utilization, with a path coefficient (β) of 0.144, a t-statistic of 2.263, and a p-value of 0.024. Thus, the first hypothesis (H1) is accepted. Work-Life Balance is also proven to have a positive and significant effect on Gemini AI Utilization, with a β value of 0.391, a t-statistic of 7.227, and a p-value of 0.000, so the second hypothesis (H2) is accepted, showing the strongest direct path coefficient in the model.

The test results also show that Workload has a significant effect on Teacher Performance, with a β value of -0.364, a t-statistic of 7.232, and a p-value of 0.000. Unlike H1 and H2, this coefficient is negative, meaning that higher workload is associated with lower teacher performance. Thus, the third hypothesis (H3) is accepted, with a negative direction of influence. Work-Life Balance has a positive and significant effect on Teacher Performance, with a β value of 0.299, a t-statistic of 5.281, and a p-value of 0.000, so the fourth hypothesis (H4) is accepted. Gemini AI Utilization has a positive and significant effect on Teacher Performance, with a β value of 0.270, a t-statistic of 4.972, and a p-value of 0.000, so the fifth hypothesis (H5) is accepted.

In testing the mediation effect, Gemini AI Utilization was found to significantly mediate the effect of Workload on Teacher Performance, indicated by a β value of 0.039, a t-statistic of 2.108, and a p-value of 0.035. Because the direct effect of Workload on Teacher Performance is negative (-0.364) while this indirect effect is positive (0.039), the two paths run in opposite directions; this pattern is categorized as competitive partial mediation. Therefore, the sixth hypothesis (H6) is accepted. Gemini AI Utilization was also found to significantly mediate the effect of Work-Life Balance on Teacher Performance, indicated by a β value of 0.106, a t-statistic of 4.111, and a p-value of 0.000. Because the direct effect of Work-Life Balance on Teacher Performance (0.299) and this indirect effect (0.106) both run

in the same positive direction, this pattern is categorized as complementary partial mediation. Thus, the seventh hypothesis (H7) is accepted.

Discussion

The results of the H1 test show that Workload has a positive and significant effect on Gemini AI Utilization. This finding indicates that the higher the work demands faced by KSRG teachers, the greater their tendency to use Gemini AI as a work aid. This result is consistent with the descriptive condition of Workload, which falls into the fairly high category (mean score 789), and with respondent characteristics showing that all respondents had used Gemini AI, with 59% using it frequently. According to Conservation of Resources Theory, individuals facing a threat of resource loss in the form of time, energy, and cognitive capacity due to rising work demands will attempt to acquire additional resources to sustain their capability (Hobfoll et al., 2018). This finding is consistent with Acosta-Enriquez et al., (2025), who found that academic overload drives the use of AI models, and with Mustofa & Rulyansah, (2025), who found that AI can help reduce teachers' administrative burden.

The results of H2 indicate that Work-Life Balance has a positive and significant effect on Gemini AI Utilization, with the largest coefficient among all direct paths in the model. Teachers with good work-life balance (mean score 821; fairly good category) tend to have more adequate energy, concentration, and psychological readiness to learn and integrate new technology into their work. According to Conservation of Resources Theory, individuals who are able to preserve their personal resources have a greater capacity to invest those resources in the process of technology adaptation (Hobfoll et al., 2018). This result supports Hanjaya et al., (2025), who found that work-life balance has a positive effect on teachers' digital dexterity, reinforcing the argument that work-life balance is an important foundation for readiness to adopt generative AI technology.

The results of H3 show that Workload has a negative and significant effect on Teacher Performance. This finding is reinforced by the descriptive result showing that the weakest indicator of Teacher Performance is the ability to complete the amount of work in line with assigned responsibility (score 642; poor category), in contrast to the fairly high score for teachers' concern about meeting the school's work-outcome standards on the Workload variable (score 833). According to Conservation of Resources Theory, continuous work demands without adequate resources can deplete energy, time, and psychological condition, thereby lowering performance (Hobfoll et al., 2018). This result differs from Yuliani et al., (2022) and (Muthinnah et al., 2025), who reported a positive effect of workload on performance; this difference is likely due to the dual instructional and digital-administrative demands faced by KSRG teachers, so that in this context workload functions more as a resource-depleting demand than as a performance driver.

The results of H4 indicate that Work-Life Balance has a positive and significant effect on Teacher Performance. Teachers who are able to maintain a balance between work and personal life tend to experience lower stress, better work energy, and higher concentration in

carrying out instructional tasks. According to Conservation of Resources Theory, the ability to preserve personal resources helps individuals face work demands while sustaining performance (Hobfoll et al., 2018). This finding is consistent with Assalamah et al., (2026), who found a positive contribution of work-life balance to educator performance, and with Hanjaya et al., (2025), who found a positive and significant effect of work-life balance on teacher performance.

The results of H5 show that Gemini AI Utilization has a positive and significant effect on Teacher Performance. According to Task-Technology Fit Theory, technology has a positive impact on performance when its capability fits the user's task requirements (Muchenje & Seppänen, 2023). Gemini AI has capabilities relevant to teachers' work, such as preparing teaching materials, developing assessments, processing information, and completing administrative tasks, so that its optimal utilization can reduce the time needed for routine work and free teachers to focus on activities that require professional and pedagogical judgment. This result supports Tang, (2026), who found that AI technology has a positive effect on employee performance, and Aghaee et al., (2024), who explained that generative AI has the potential to help educators save time and improve the quality of educational activities.

The results of H6 indicate that Gemini AI Utilization significantly mediates the effect of Workload on Teacher Performance. This finding reveals an interesting mechanism: the direct effect of Workload on Teacher Performance is negative (-0.364), while the indirect effect through Gemini AI Utilization is positive (0.039). Because both paths are significant but run in opposite directions, this pattern is categorized as competitive partial mediation. In other words, rising workload directly suppresses performance, but it simultaneously drives teachers to use Gemini AI, which in turn contributes positively to performance as a form of compensation for that negative impact. According to Conservation of Resources Theory, individuals facing increased demands will seek alternative resources to prevent further resource loss (Hobfoll et al., 2018); in this context, Gemini AI functions as such a compensatory resource, consistent with Acosta-Enriquez et al., (2025) and Mustofa & Rulyansah, (2025).

The results of H7 show that Gemini AI Utilization also significantly mediates the effect of Work-Life Balance on Teacher Performance. Unlike the pattern found for H6, the direct effect of Work-Life Balance on Teacher Performance (0.299) and its indirect effect through Gemini AI Utilization (0.106) are both significant and run in the same positive direction, so this pattern is categorized as complementary partial mediation. Teachers with healthy work-life balance have a better mental capacity to learn and integrate Gemini AI into their work, which in turn strengthens the improvement of their performance simultaneously. According to Conservation of Resources Theory and Task-Technology Fit Theory, work-life balance helps individuals preserve personal resources that can be invested in utilizing technology that fits their task requirements (Hobfoll et al., 2018). This finding extends Ninghardjanti et al., (2025), who showed the mediating role of general digital dexterity, by confirming that a more

specific form of AI utilization, namely Gemini AI, can also serve as a mechanism linking work-life balance to improved teacher performance.

Managerially, these findings underline the importance of integrated management combining proportional workload allocation, the strengthening of work-life balance, and the structured integration of Gemini AI in the KSRG school environment. Schools need to keep teachers' workload proportional, particularly by limiting routine administrative tasks that intrude into time outside formal working hours, for example through a standard operating procedure that encourages the use of Gemini AI to draft administrative documents such as teaching modules and grade recapitulations. A digital-boundary policy is also needed so that school work does not fully spill over into teachers' personal lives. Because a gap remains between the perceived benefit of Gemini AI and the intensity of its actual use, schools and KSRG program managers are advised to provide applied prompt-writing training and a shared prompt repository to ease the adoption of the technology into teachers' daily routines.

CONCLUSION AND SUGGESTIONS

This study shows that Workload and Work-Life Balance are factors that contribute significantly to Teacher Performance among KSRG teachers, both directly and through the mediation of Gemini AI Utilization. Workload drives the intensity of Gemini AI use as a teacher adaptation strategy, yet directly lowers teacher performance, indicating that high work demands without adequate management deplete personal resources more than they stimulate productivity. Conversely, good work-life balance improves both Gemini AI Utilization and teacher performance directly, confirming that work-life balance is a resource base that enables teachers to adapt to technology while sustaining their productivity. The tested model explains 31.4% of the variance in Teacher Performance and 18.0% of the variance in Gemini AI Utilization, with adequate predictive relevance ($Q^2 > 0$ for both endogenous constructs).

Gemini AI Utilization itself has a positive effect on teacher performance and plays a significant mediating role on both pathways, although with a different mediation character: competitive mediation on the workload-performance relationship, because its direct and indirect effects run in opposite directions, and complementary mediation on the work-life balance-performance relationship, because both effects run in the same positive direction. These findings reinforce the relevance of Conservation of Resources Theory and Task-Technology Fit Theory in explaining how generative AI technology can function simultaneously as a compensatory resource and as a reinforcing mechanism linking teachers' working conditions to their performance outcomes.

For KSRG management, the results of this study suggest three priorities. First, proportional workload management should be a key investment, particularly by limiting routine administrative tasks that spill into time outside formal working hours, supported by standard operating procedures that direct the use of Gemini AI for drafting administrative documents. Second, work-life balance policies need to be strengthened through flexible scheduling and adequate recovery time, especially for teachers with high instructional and

administrative loads. Third, structured Gemini AI training should be developed, focusing not only on basic operation but also on effective prompt writing, verification of AI-generated content, and ethical, responsible use in instructional and administrative activities.

This study has several limitations. First, the cross-sectional design does not capture how workload, work-life balance, and Gemini AI utilization change over time; a longitudinal study could clarify these dynamics. Second, the sample is limited to teachers within the KSRG program; replication in non-KSRG schools is needed to test generalizability. Third, the model's R-square values indicate that other factors outside the model, such as AI literacy, technology readiness, organizational support, or technostress, also influence Gemini AI utilization and teacher performance and could be examined in future research.

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