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Analysis of the Impact of Job Demands-Resources and Teachers' Burnout Levels on the Quality of Deep Learning Instruction

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Abstract

This study examines the relationships between job demands, job resources, burnout, and the quality of deep learning instruction among kindergarten teachers in Jayapura, Papua. Grounded in the Job Demands–Resources (JD-R) model, the research aims to analyze how job characteristics are associated with teacher burnout and instructional quality in an early childhood education context. A quantitative explanatory approach with a cross-sectional survey design was employed. Data were collected from 150 teachers using validated questionnaires and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The results indicate that job demands are positively associated with burnout, while job resources are negatively associated with burnout and positively related to instructional quality. Burnout is negatively associated with the quality of deep learning instruction and partially mediates the relationships between job characteristics and instructional quality. The model explains 61% of the variance in burnout and 57% in instructional quality. These findings highlight the importance of strengthening job resources, such as autonomy, collegial support, and professional development, to sustain instructional quality and teacher well-being in resource-constrained educational settings.

Keywords: Job Demands–Resources Model, Teacher Burnout, Deep Learning Instruction

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INTRODUCTION

Early childhood education (ECE) plays a crucial role in shaping the foundational learning experiences of children, demanding a high level of pedagogical quality and emotional engagement from teachers (Zhao et al., 2023). Teachers in kindergartens often face complex job demands such as managing diverse classrooms, fulfilling administrative duties, and meeting curriculum expectations, which can lead to psychological strain and emotional exhaustion (Chen et al., 2023). The Job Demands-Resources (JD-R) model provides a theoretical framework to understand how excessive demands combined with limited resources can result in teacher burnout, ultimately diminishing instructional quality (Markovič et al., 2024). This issue is particularly significant in early childhood education in under-resourced regions such as Jayapura, Papua, where teachers often face resource scarcity, low wages, and limited institutional support (Schwartz et al., 2019).

High job demands such as excessive workload, role conflict, and emotional labor have been found to increase burnout among teachers, leading to lower motivation and performance (Huo, 2025). Conversely, job resources—such as social support, autonomy, and professional development—can mitigate burnout and enhance job satisfaction (Tian & Isa, 2024). Teachers in early childhood education often rely on intrinsic motivation and social interactions to sustain their engagement with students (Balakrishnan et al., 2025). However, when job resources are insufficient to meet the emotional and physical demands, burnout becomes more prevalent, impacting both teacher well-being and the learning experiences of children (He et al., 2024).

In the context of Jayapura, kindergarten teachers face unique socio-cultural and infrastructural challenges. Limited access to professional training, low socioeconomic conditions, and high teacher-student ratios exacerbate work stress, leading to emotional exhaustion and depersonalization (Jeon et al., 2022). These stressors can diminish teachers' ability to foster deep learning—a pedagogical approach emphasizing critical thinking, conceptual understanding, and student engagement (Rafsanjani et al., 2025). Deep learning requires emotionally stable and motivated teachers who can guide students toward meaningful knowledge construction, an outcome difficult to achieve when burnout is high (Lep et al., 2023).

Furthermore, emotional and cognitive resources are essential for maintaining instructional quality and innovation in teaching methods (Rastegar & Rahimi, 2023). When teachers lack organizational support and are overburdened, they are less likely to implement reflective and student-centered practices that promote deep learning (Admiraal, 2022). Research also indicates that enhancing teachers' self-efficacy and emotional resilience can mitigate burnout and sustain teaching effectiveness, even under resource-limited conditions (Li, 2025).

Given these circumstances, it is urgent to investigate how the interplay of job demands and resources influences burnout levels among kindergarten teachers in Jayapura, Papua, and how these factors subsequently affect the quality of deep learning instruction. Such research will provide insights into developing localized interventions that promote teacher well-being, retention, and pedagogical excellence in early childhood education (Akutey et al., 2023).

Recent studies in Indonesian educational contexts have highlighted the importance of instructional design, teacher workload, and learning environments in shaping instructional quality and student outcomes (Lala, 2025; Marisa et al., 2026; Maulidah et al., 2023).

Previous studies have extensively applied the Job Demands–Resources (JD-R) model to examine teacher burnout and performance across various educational contexts. For instance, (Hakanen et al., 2006) found that job resources significantly reduce burnout and enhance work engagement among teachers. Similarly, (Skaalvik & Skaalvik, 2018) reported that high job demands are associated with increased emotional exhaustion and lower motivation. In early childhood settings, (Jennings & Greenberg, 2009) demonstrated that teacher burnout negatively affects classroom quality and student outcomes. More recent studies, such as (Chen et al., 2023; Huo, 2025), further confirmed that excessive job demands contribute to higher burnout levels, while job resources act as protective factors that improve well-being and performance.

Despite these contributions, several important gaps remain. First, most prior studies have focused on general teaching performance or job satisfaction, with limited attention to the quality of deep learning instruction, particularly in early childhood education. Second, existing research has largely been conducted in Western or more developed educational contexts, leaving underexplored the dynamics of burnout and instructional quality in resource-constrained and culturally distinct settings, such as Papua. Third, although the JD-R model has been widely used, its integration with deep learning pedagogy and its application in Indonesian early childhood education contexts remain limited.

Therefore, this study extends previous research by applying the JD-R framework to examine not only burnout but also its relationship with the quality of deep learning instruction among kindergarten teachers in Jayapura. By doing so, this study contributes to the literature by providing context-specific empirical evidence and highlighting how job demands and resources operate within a unique socio-cultural environment.

METHODS

Research Approach and Design

This study employed a quantitative explanatory design based on the Job Demands–Resources (JD-R) model (Bakker & Demerouti, 2017) to examine the relationships among job demands, job resources, burnout, and the quality of deep learning instruction.

Although this study tests directional relationships derived from theory, it is important to note that the use of a cross-sectional survey design limits the ability to draw strong causal conclusions. As highlighted in methodological literature (Anderson-Cook, 2005; Hair Jr et al., 2021), causal inference requires longitudinal or experimental approaches. Therefore, the findings of this study should be interpreted as theory-supported associative relationships, rather than definitive causal effects.

Research Design

This study employed a quantitative explanatory research design with a cross-sectional survey approach. The unit of analysis was individual kindergarten teachers in Jayapura, Papua.

The research model was developed based on the Job Demands–Resources (JD-R) framework and structured to examine both direct and indirect (mediated) relationships among variables. Specifically, burnout was positioned as a mediating variable linking job demands and job resources to the quality of deep learning instruction. The model includes both direct paths (e.g., job demands → instructional quality; job resources → instructional quality) and indirect paths through burnout, consistent with the mediation analysis conducted using PLS-SEM.

Methodologically, this study is limited by its cross-sectional and non-experimental design, which restricts the ability to establish strong causal inference. Therefore, the identified relationships should be interpreted as theory-driven associative and predictive relationships, rather than definitive causal effects.

Population and Sample

The study population consisted of all kindergarten teachers in Jayapura City, Papua Province, totaling approximately 185 teachers based on data from the Jayapura City Department of Education (2025). From this population, 150 teachers were selected as research participants.

A proportionate stratified random sampling technique was employed to ensure representation across different types of schools, namely public, private, and foundation-based kindergartens. The proportion of samples drawn from each stratum was determined based on the relative number of teachers within each school category in the population. Thus, strata with a larger number of teachers contributed proportionally more respondents to the sample.

Within each stratum, a simple random selection process was conducted. A list of teachers was obtained from each participating school, and respondents were selected using a randomization procedure (e.g., random number assignment) to ensure that each teacher had an equal probability of being included.

The final sample consisted of teachers from 18 kindergartens located across Abepura, North Jayapura, and South Jayapura districts. The sample size met the minimum requirement for Structural Equation Modeling (SEM), which is at least five times the number of indicators (Hair et al., 2022).

Research Variables and Instruments

This study examined four main variables:

1. Job Demands (X_1) — measured through three indicators: workload, time pressure, and task complexity. The items were adapted from the *Job Demands Scale* by (Bakker & Demerouti, 2017).
2. Job Resources (X_2) — measured through four indicators: colleague support, autonomy, feedback, and professional development opportunities.
3. Burnout (Y_1) — measured using the Maslach Burnout Inventory (MBI), which includes three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment.
4. Quality of Deep Learning Instruction (Y_2) — measured by adapting items from the *Teacher Instructional Quality* and *Deep Learning Approach* scales, covering four aspects: child engagement, teacher reflection, meaningful learning, and authentic assessment.

All items were rated on a five-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Data Collection Procedure

Data were collected using questionnaires distributed both online (via Google Forms) and offline between September and October 2025. A pilot test was conducted on 30 kindergarten teachers outside the main sample to test the clarity and reliability of the items before full data collection.

Validity and Reliability Tests

Instrument validity and reliability were assessed prior to hypothesis testing to ensure the accuracy and consistency of the measurements.

Validity testing was conducted using item-total correlation analysis, where each item's correlation coefficient was compared against the minimum threshold of 0.30, as commonly recommended in social science research. Items with correlation

values above this threshold were considered to have adequate construct validity, indicating that they appropriately represent the intended variables.

Reliability testing was performed using Cronbach's Alpha coefficient to evaluate the internal consistency of each construct. A Cronbach's Alpha value of 0.70 or higher was used as the acceptable criterion for reliability.

The results showed that all items had item-total correlation coefficients greater than 0.30, indicating acceptable validity. The Cronbach's Alpha values for each construct were as follows: Job Demands = 0.84, Job Resources = 0.87, Burnout = 0.89, and Quality of Deep Learning Instruction = 0.91. These values exceed the recommended threshold, confirming that all instruments are reliable and suitable for further analysis.

Data Analysis Technique

Data were analyzed using SmartPLS 4.0 software, as the research model involved latent variables with mediating effects. The analysis consisted of the following stages:

1. Outer Model Evaluation — to assess convergent validity, discriminant validity, and construct reliability using *Average Variance Extracted (AVE)* and *Composite Reliability (CR)* values.
2. Inner Model Evaluation — to assess causal relationships between latent variables using *path coefficients* and *t-statistics* obtained through bootstrapping with 5,000 samples.
3. Mediation Test — to identify the mediating effect of *Burnout* between *Job Demands* / *Job Resources* and *Deep Learning Quality*.
4. Dominance Test — to determine which variable had the greatest influence on *Burnout* and *Instructional Quality*.

The results showed that the model achieved a good level of fit, with an R^2 value of 0.67, indicating that the independent variables explained 67% of the variance in the dependent variable.

Research Ethics

This study obtained official approval from the Jayapura City Department of Education and the management of each participating kindergarten. All respondents were informed about the purpose of the study and assured of data confidentiality. Participation was voluntary, and respondents could withdraw at any time.

RESULTS & DISCUSSION

This section presents the quantitative results of the study conducted on 150 kindergarten teachers in Jayapura, Papua. The analysis was performed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach to examine both the measurement (outer) and structural (inner) models. The results include the demographic profile of respondents and descriptive statistics for each research variable: job demands, job resources, teacher burnout, and the quality of deep learning instruction.

Respondent Profile

The respondents consisted of 150 kindergarten teachers from public, private, and foundation-based institutions across Jayapura City and its surrounding districts. The demographic distribution is presented in Table 1.

Table 1. Demographic Profile of Respondents

Variable	Category	Frequency	Percentage
Gender	Female	129	86.0%
	Male	21	14.0%
Age	20–30 years	28	18.7%
	31–40 years	67	44.7%
	41–50 years	38	25.3%
	>50 years	17	11.3%
Teaching Experience	<5 years	22	14.7%
	5–10 years	58	38.7%
	11–20 years	49	32.7%
	>20 years	21	14.0%
Education Level	Diploma	11	7.3%
	Bachelor	122	81.3%
	Master	17	11.4%

Most participants were female teachers (86%), predominantly aged between 31–40 years (44.7%), reflecting the typical demographic composition of early childhood educators. A large proportion had 5–15 years of teaching experience (71.4%), indicating substantial professional exposure. The majority held a Bachelor's degree (81.3%), showing a generally adequate educational background among kindergarten teachers in Jayapura. These demographic characteristics suggest that the respondents represent a mature and professionally experienced group of educators in early childhood education.

Descriptive Statistics

Descriptive analysis was conducted to understand the overall tendencies of each construct. The categorization of mean scores was based on a five-point Likert scale (1–5), using the following interval criteria:

a. 1.00–1.80 = Very Low
b. 1.81–2.60 = Low
c. 2.61–3.40 = Moderate
d. 3.41–4.20 = High
e. 4.21–5.00 = Very High

The results in Table 2 show that job demands and job resources were both relatively high, while burnout was moderate, and deep learning instructional quality was high.

Table 2. Descriptive Statistics of Research Variables

Variable	Mean	SD	Category
Job Demands	3.85	0.92	High
Job Resources	3.75	0.94	High
Burnout	3.23	1.07	Moderate
Deep Learning Quality	3.98	0.76	High

Teachers in Jayapura reported relatively high job demands and moderate access to resources. Despite moderate burnout levels, they maintained a high

standard of deep learning instruction, indicating strong resilience and motivation among early childhood educators.

Measurement Model

The measurement model was assessed to evaluate the reliability and validity of each construct. Convergent validity was examined using outer loadings and Average Variance Extracted (AVE), while reliability was assessed using Composite Reliability (CR) and Cronbach's Alpha.

The results show that all indicators have satisfactory outer loading values, ranging from 0.71 to 0.88, exceeding the recommended threshold of 0.70. This indicates that each indicator has a strong contribution in explaining its respective latent construct. No indicators were removed, as all met the minimum criteria for indicator reliability. Table 3 presents the summary of reliability and validity measures.

Table 3. Reliability and Validity of Constructs

Construct	AVE	CR	Cronbach's α
Job Demands	0.62	0.89	0.85
Job Resources	0.58	0.87	0.83
Burnout	0.60	0.88	0.84
Deep Learning Quality	0.64	0.91	0.89

All constructs met the threshold values for convergent validity (AVE > 0.50) and reliability (CR > 0.70; α > 0.70). Furthermore, the strong outer loading values confirm that the indicators adequately represent their respective constructs. Discriminant validity was also confirmed, as each construct's square root of AVE exceeded its inter-construct correlations.

These results indicate that all measurement items are valid and reliable for further structural model analysis.

Structural Model

The inner model was tested to evaluate the hypothesized relationships among variables. The analysis used bootstrapping with 5,000 resamples to assess path coefficients, t-values, and p-values.

Table 4. Results of Structural Model Testing

Hypothesis	Path	Coefficient (β)	t-value	p-value	Result
H1	Job Demands → Burnout	0.54	8.12	0.000	Supported
H2	Job Resources → Burnout	-0.47	7.85	0.000	Supported
H3	Burnout → Deep Learning Quality	-0.39	6.48	0.000	Supported
H4	Job Demands → Deep Learning Quality	-0.23	3.96	0.001	Supported
H5	Job Resources → Deep Learning Quality	0.42	7.18	0.000	Supported

The model demonstrated acceptable fit with SRMR = 0.056 and NFI = 0.91. The coefficient of determination values showed that the model explained 61% of the variance in Burnout (R^2 = 0.61) and 57% of the variance in Deep Learning Quality (R^2 = 0.57), indicating a good explanatory capability.

Job demands significantly increased burnout, while job resources reduced it. Burnout, in turn, negatively affected the quality of deep learning instruction. Job resources also had a direct positive influence on learning quality, suggesting that supportive working conditions enhance instructional effectiveness.

Mediation Analysis

A mediation test was conducted to examine whether burnout mediated the relationships between job demands, job resources, and deep learning quality. The bootstrapping results indicated significant indirect effects.

Table 5. Mediation Effects

Relationship	Indirect Effect (β)	t-value	p-value	Mediation Type
Job Demands → Burnout → Deep Learning Quality	-0.21	4.98	0.000	Partial Mediation
Job Resources → Burnout → Deep Learning Quality	0.18	4.27	0.000	Partial Mediation

Burnout partially mediated both relationships, confirming that while job demands and resources have direct effects on instructional quality, their influence is also channeled through teachers' emotional states. These findings are consistent with the Job Demands–Resources (JD-R) theoretical framework, which posits that high demands lead to strain, while adequate resources promote engagement and performance.

Dominance Analysis

Dominance testing was performed to identify the variable with the strongest influence on burnout and instructional quality, based on effect size (f^2).

Table 6. Dominance Test Results

Predictor	Dependent Variable	Effect Size (f^2)	Interpretation
Job Demands	Burnout	0.45	Strong Effect
Job Resources	Burnout	0.31	Moderate Effect
Burnout	Deep Learning Quality	0.28	Moderate Effect
Job Resources	Deep Learning Quality	0.34	Strong Effect

The results show that job demands exerted the strongest effect on burnout, while job resources had the greatest impact on deep learning quality. This suggests that improving resource availability (feedback, autonomy, facilities, and training) can more effectively sustain high-quality teaching than merely reducing workload.

Discussion

Relationship Between Findings and the JD-R Theory

The findings of this study reinforce the core assumptions of the Job Demands–Resources (JD-R) theory (Bakker & Demerouti, 2017), which explains employee well-being and performance through two main processes: the health-impairment process and the motivational process. The significant positive effect of job demands on burnout ($\beta = 0.54$) confirms that excessive workload, time pressure, and task complexity contribute to psychological strain among teachers. Conversely, the negative effect of job resources on burnout ($\beta = -0.47$) and its positive effect on

instructional quality (β = 0.42) support the motivational role of resources in enhancing performance.

Importantly, the model explains a substantial proportion of variance in burnout ($R^2 = 0.61$) and deep learning quality ($R^2 = 0.57$), indicating that the JD-R framework provides strong explanatory power in the context of early childhood education in Jayapura. These findings align with previous studies showing that job resources not only buffer the negative effects of demands but also directly enhance work engagement and performance.

However, this study also reveals a contextual nuance: despite relatively high job demands (Mean = 3.85) and moderate burnout (Mean = 3.23), teachers still demonstrate high levels of instructional quality (Mean = 3.98). This pattern suggests that additional mechanisms may be operating beyond the standard JD-R model.

Extending the JD-R Model: Toward a Meaning-Based Interpretation

To explain this pattern, the findings can be interpreted through the lens of meaning-based coping and intrinsic motivation theories, which emphasize that individuals are more resilient when they perceive their work as meaningful (Folkman, 2020; Ryan & Deci, 2000). In this study, although direct qualitative data were not collected, the consistently high instructional quality alongside moderate burnout indicates that teachers may reinterpret job demands as meaningful challenges rather than purely stressors.

This interpretation is supported indirectly by the dominance analysis, which shows that job resources have a strong effect on instructional quality ($f^2 = 0.34$), suggesting that supportive environments (e.g., collegial support, autonomy, and professional development) enable teachers to maintain performance even under pressure. In line with self-determination theory, such resources enhance intrinsic motivation, which in turn sustains engagement and resilience.

Rather than introducing a new construct without sufficient empirical grounding, this study positions the observed phenomenon as a meaning-oriented coping tendency, which complements the JD-R model. This approach is more theoretically grounded and avoids overgeneralization beyond the available data.

Reinterpreting the Role of Cultural and Social Context

The earlier claim that teaching is perceived as a "moral duty" requires careful clarification. Since this study relies on quantitative survey data, such an interpretation cannot be treated as a direct empirical finding. Instead, it should be framed as a contextual interpretation supported by existing literature.

Previous studies in collectivist and community-oriented contexts have shown that teachers often derive motivation from social responsibility, community expectations, and professional identity (Schwartz et al., 2019). In line with this perspective, the relatively high instructional quality observed in this study may reflect the influence of social and relational job resources, such as collegial support and shared responsibility, which are already measured within the job resources construct.

Thus, rather than asserting moral obligation as a standalone claim, this study interprets the findings as evidence that socially embedded job resources play a crucial role in sustaining teacher performance in resource-constrained environments.

Comparison with Previous Studies

The findings are consistent with prior empirical research validating the JD-R model across educational contexts. Hakanen et al. (2006) demonstrated that job resources reduce burnout and enhance engagement, while Jennings and Greenberg (2009) highlighted the negative impact of burnout on classroom quality.

However, this study adds nuance by showing that high instructional quality can still be maintained under moderate burnout conditions. This finding aligns with recent studies suggesting that the relationship between burnout and performance is not always linear and may be moderated by contextual and motivational factors (Lep et al., 2023; Rastegar & Rahimi, 2023). These findings are also consistent with recent studies, which emphasize that instructional quality is strongly influenced by learning design, teacher capacity, and contextual support systems (Ardani et al., 2025; Hardianto, 2025).

Compared to studies in Western contexts, where high job demands are often associated with reduced performance, the present findings suggest that the presence of adequate job resources can offset these negative effects. This highlights the importance of examining JD-R dynamics within specific socio-cultural and institutional contexts.

Implications and Recommendations (Derived from Findings)

The implications of this study are directly derived from the empirical results.

First, given that job demands have the strongest effect on burnout ($f^2 = 0.45$), efforts to manage workload and administrative burden are essential to prevent excessive psychological strain among teachers.

Second, since job resources significantly reduce burnout and strongly enhance instructional quality, schools should prioritize strengthening key resources, particularly:

a. collegial support systems
b. teacher autonomy in instructional decisions
c. access to continuous professional development

These recommendations are directly supported by the significant effects of job resources on both burnout ($\beta = -0.47$) and instructional quality ($\beta = 0.42$).

Third, the mediating role of burnout indicates that improving teacher well-being is not only important for individual health but also for maintaining instructional effectiveness. Therefore, schools should implement well-being-oriented interventions, such as peer mentoring and emotional support programs.

At the policy level, the findings suggest that improving educational quality in early childhood settings should not rely solely on curriculum reforms, but also on systematic investment in teacher support systems, as these have a direct and indirect impact on instructional quality.

This study contributes to the literature in three main ways. First, it empirically confirms the applicability of the JD-R model in early childhood education within a resource-constrained context. Second, it demonstrates that job resources play a dual role in both reducing burnout and directly enhancing instructional quality. Third, it offers a more theoretically grounded interpretation of resilience by linking the findings to meaning-based coping and intrinsic motivation, rather than introducing unsupported constructs.

Overall, the study highlights that the effectiveness of the JD-R model can be strengthened by considering how individuals interpret and respond to job demands within their specific work environments.

CONCLUSION

This study confirms that the Job Demands–Resources (JD-R) framework effectively explains how workload, available resources, and burnout interact to influence instructional quality in early childhood education. Kindergarten teachers in Jayapura experience high job demands but maintain strong motivation and teaching quality through intrinsic and cultural job resources such as moral commitment, social cohesion, and a sense of vocation. These contextual factors act as buffers that mitigate the negative impact of burnout on learning quality.

The results emphasize that promoting professional autonomy, collegial support, and continuous development opportunities is essential to sustain effective deep learning instruction. Moreover, incorporating moral and community-based support systems can strengthen resilience and job satisfaction among teachers in under-resourced environments.

Schools should simplify administrative procedures, establish mentoring systems, and provide emotional regulation training. Policymakers must integrate teacher well-being into educational quality standards and allocate resources for supportive learning environments.

This study was limited to kindergarten teachers in Jayapura and used quantitative self-report data, which may not fully capture contextual nuances. Future research should incorporate qualitative or mixed methods and expand to other provinces to examine how moral and cultural job resources function across Indonesia's diverse educational contexts.

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