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Article

Fostering sustainable education through decent work: The JD-R model, innovative behavior, and performance of higher education lecturers in Vietnam

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Abstract: Achieving sustainable education (SDG 4) relies heavily on the well-being, innovation, and performance of educators. Rooted in the context of decent work (SDG 8), this study aims to investigate how job demands and job resources jointly influence lecturers' innovative work behavior and job performance in the higher education sector. Using the Job Demands-Resources (JD-R) model as a theoretical foundation, the research explores the mediating role of innovative work behavior in linking daily work conditions to sustainable performance outcomes. A quantitative research design was employed using survey data collected from 432 lecturers in higher education in Vietnam, analyzed via Structural Equation Modeling (SEM). Results indicate that well-balanced job demands and resources significantly predict innovative work behavior, which in turn positively influences job performance. The findings suggest that educational institutions aiming for sustainable development must provide decent working conditions, featuring manageable demands and adequate resources, to cultivate an innovation-supportive culture. This paper contributes to the literature on sustainable education management by bridging the motivational mechanisms of the JD-R model with sustainable performance, offering practical insights for policymakers and university administrators to build resilient and innovative academic environments.

Keywords: sustainable higher education; decent work; innovative work behavior; lecturer performance; SDG 4

1. Introduction

Universities have been progressively identified as important agents in the sustainable social development over the last two decades, especially in the implementation of the United Nations Sustainable Development Goal on Quality Education (SDG 4). Universities are under pressure to deliver outstanding teaching [1], world class research [2] and to contribute to societal resilience [3] in order to accomplish these global goals. These expectations have placed unprecedented strain on academic personnel, especially in quickly developing higher education systems such as China, Vietnam and Indonesia [4]. Empirical case studies confirm that scientific research and educational practice function as mutually reinforcing pathways toward the SDGs. Drissi et al. [5] documented how a Moroccan university integrated sustainability across teaching, research, and community engagement, demonstrating that institutional research output in areas such as clean energy (SDG 7) and public health (SDG 3) directly strengthened the quality and relevance of educational programs aligned with SDG 4. Applied research further illustrates this synergy: Meftah et al. [6] showed that sustainable water treatment technologies developed

through university research contribute simultaneously to SDG 3 and SDG 6, while Meftah et al. [7] extended these findings by providing evidence that bio-adsorbent innovations generate indirect contributions to SDG 1, SDG 2, SDG 7, SDG 8, SDG 9, SDG 11, and SDG 12. These studies collectively indicate that sustainable educational outcomes depend on the alignment of research capacity, pedagogical innovation, and institutional support systems.

To maintain high performance levels and constant innovation without sacrificing faculty well-being, higher education institutions need to develop acceptable work environments (SDG 8). If educators are under unsustainable job pressures and lack sufficient support, they cannot be expected to deliver sustainable education. It is theoretically and practically necessary to examine the link between daily job needs, job resources, inventive work behavior and job performance for sustainable university management.

A hypothesis to describe the influence of job demands and job resources on the innovative work behavior and job performance of lecturers is the Job Demands-Resources (JD-R) theory. The theory indicates that each job is made up of two basic parts: Job demands, which are the constant effort and can cause stress, and job resources, which help in reaching goals, lowering stress and allowing for personal development [8]. In the university setting, the demands of work are generally represented by research duties, public pressure, large teaching loads and complicated administrative work. Job resources include research funding, professional development opportunities, peer support, and technology infrastructure. Understanding how these components collectively influence lecturer' innovative work behavior and job performance is a worthy research question.

Empirical studies on job demands have shown conflicting outcomes. On the other hand, too much pressure may lead to burnout and poor performance [9]. On the other hand, some forms of demands, such as "challenge demands" might enhance motivation and performance [10]. For example, although stressful, the pressure to publish in high impact journals might motivate professors to build collaborative networks that ultimately promote productivity and improve research competencies. In contrast, "hindrance demands" including bureaucratic administrative procedures are likely to decrease production.

Innovative work behavior has received increasing scholarly attention. Janssen [11] defines innovative work behavior as the generation, promotion, and realization of novel ideas within the work context. This could be the integration of digital tools in classrooms, the creation of new courses, or interdisciplinary research projects within an academic setting. Innovative work behavior has been demonstrated to be a major determinant in enhancing performance, especially in knowledge-based sectors [12]. Several studies have examined innovative work behavior as a mediating variable within higher education [13,14]. These investigations, however, focused predominantly on single pathways (either job demands or job resources) and did not operationalize them as second-order constructs capturing both structural and psychological dimensions. The present study extends this line of inquiry by simultaneously modeling job demands and job resources as higher-order constructs and testing the dual mediating pathway of innovative work behavior in a transitional higher education system. This approach allows for a more precise estimation of how

balanced work design contributes to sustainable academic performance.

The quality of universities is directly influenced by the performance of lecturers [15]. Effective instruction by lecturers provides students with greater training and assistance. High-quality research is a way for institutions to develop their scholarly reputation, acquire funding and contribute to the global knowledge base. In the current competitive environment lecturers are assessed not only by the quantitative performance (number of hours of teaching, the number of publications), but also their creativity in the application of new teaching methods, the implementation of interdisciplinary research, the development of curricular, academic advice and the contribution to academic governance [16]. Or, in other words, today's performance is strongly tied to the capacity to innovate.

Despite extensive prior research, several critical gaps remain. First, the majority of research on job demands has mostly focused on the bad aspects such as stress or burnout, but neglected the potential of job demands as positive motivators that might spark creativity. Second, job resources are frequently considered as a homogeneous notion, while structural resources (e.g. research funds, facilities) and psychological resources (e.g. autonomy, recognition) could have different, context-specific effects. Third, the mediating effect of innovative work behavior on the relationship between job demands, job resources and job performance have not been extensively examined in the setting of university.

The current study attempts to address these research gaps by empirically exploring the links between job demands, job resources, innovative work behavior and job performance of lecturers. More specifically, it investigates the direct impact of workplace demands and job resources on job performance, and the mediating effect of innovative work behavior. This design offers a more integrated perspective on how lecturers sustain performance under pressure

This study has two important contributions. Theoretically, it extends the JD-R model to higher education and highlights the mediating role of innovative work behavior. From a practical perspective, it offers useful insights to university administrators in developing policies to meet demands and resources, and to stimulate innovation to boost job performance.

2. Literature review and hypothesis development

2.1. The relationship between job resource and innovative work behavior

According to JD-R framework job resources are the physical, psychological, social or organizational features of the job that allow employees to achieve work goals, to minimize job pressures, and to drive personal growth [17,18]. These resources (autonomy, feedback, and supervisor support) ignite a motivational process that increases engagement, self-efficacy, and proactivity. When employees feel supported and empowered, they are safer to take risks and experiment with new ideas, and so display better innovative work behavior.

There is reliable research in support of this mechanism. Therefore, Pham et al. [19] found that empowerment and job security encourage innovative work behavior, Jang and Kim [20] found autonomy to be a critical predictor of creativity, and Zia et al. [21] validated that engineers' inventive behaviors increase with accessible job

resources. Thus, job resources are facilitators that induce employees to originate and implement ideas properly.

In terms of sustainability, supplying enough job resources is a manifestation of sustainable human resource policies that preserve faculty well-being and foster a decent work environment that nurtures the psychological safety needed for innovation.

H1: Job resources positively affect innovative work behavior.

2.2. The relationship between job demands and innovative work behavior

Innovative work behavior is defined as intentional creation, development, and application of new ideas to improve work processes and outcomes [11,22]. In the Job Demands-Resources (JD-R) paradigm [23,24], job demands are defined as "aspects of the job that require sustained physical and/or psychological effort". When seen as challenge demands (e.g., workload, time pressure, cognitive complexity), such conditions might trigger problem-solving and adaptive thinking, leading to inventive responses [25,26]. On the other hand, hindrance needs such as role ambiguity and employment insecurity are more likely to exhaust resources and inhibit creativity.

The empirical evidence is mixed. However, Janssen [11] observed that the relationship is moderated by effort-reward fairness. Other research argued that job demands typically indirectly encourage innovative work behavior through engagement or motivation [27]. Thus, this study is concerned with challenge demands as stimulants of innovative work behavior. It is hypothesized that:

H2: Job demands positively affect innovative work behavior.

2.3. Innovative work behavior and job performance

Innovative work behavior is the mechanism of behavior of employees to improve their performance through the introduction and application of new ideas [12,28]. Innovation is the key that allows employees to adapt to change, optimize resources and increase process quality.

In the context of the fast changing educational landscape, innovative work behavior is not only a tool for short-term productivity enhancement, but also a key survival mechanism for universities to adapt and achieve sustained institutional development. Innovative work behavior is the theoretical translation of motivation into performance. According to the Social Exchange Theory, the organization's support is reciprocated by the personnel with new contributions [29]. In the Conservation of Resources (COR) theory, innovation enables individuals to accumulate and re-invest their resources, knowledge, skills and networks for continued effectiveness [30]. According to Social Identity Theory, employees that identify with their organization innovate to improve collective reputation as well [31].

Across industries, empirical data demonstrates that innovative work behavior enhances task quality and adaptability [32]. Innovation can disrupt routines in the short term but has a favorable and durable long-term influence on performance [33]. Based on this, we suggest the following hypothesis:

H3: Innovative work behavior positively affects job performance.

2.4. The relationship between job resource and job performance

Resources have a significant influence in the motivation to improve performance [34]. They help to achieve goals, increase engagement, and foster personal growth, which in turn enhances effectiveness and well-being. Availability of resources like as autonomy, feedback and social support is related to increased energy, commitment and adaptive performance of employees.

This relationship is supported by empirical evidence. Daily diary and longitudinal work [35] shown that day-level resource variations are highly related to day-level performance through good emotions and engagement. Studies in the health care and service sectors also confirm that work engagement mediates the relationship between resources and performance [36]. Therefore, people with more job resources are more motivated and more capable to execute at high levels. The hypothesis is:

H4: Job resources positively affect job performance.

2.5. The relationship between job demand and job performance

Within the JD-R, job expectations can be motivating or a source of tension dependent on their appraisal. Challenge demands (e.g., workload, complicated tasks) may lead to attention and skill development, but hindrance demands (e.g., role ambiguity, limits) hinder performance [37,38]. Hence the effect of demands is context-dependent.

Meta-analytic research reveals that most job demand stressors (e.g., role ambiguity, role conflict, and overload) are negatively associated to job performance, with the highest negative impacts for role ambiguity and situational limitations [38]. However, long-term studies show that challenging demands, such as workload and cognitive demands can be positively temporally related to job performance, especially when employees have opportunity for restoration and recovery [39]. Importantly, the positive effect of job demands on performance is more likely when job security is high, while the negative influence is significant when job security is low [40]. Despite these findings, research gaps persist understanding the long-term effects of different types of job demands and the processes via which they impact performance in varied occupational settings.

H5: Job demands positively affects job performance.

2.6. Mediating role of innovative work behavior in the relationship between job resources and job performance

Job resources trigger a motivational process, which motivates people to innovate and subsequently enhances performance [41]. Social Exchange Theory suggests that employees' innovative work conduct is reciprocating organizational support. COR and Social Identity theories highlight the fact that innovation serves to increase resources and foster collaborative achievement.

All the links in this chain have empirical support. On a micro level, psychological empowerment a psychological and organizational resource has been demonstrated to improve both innovative work behavior and job performance with innovative work behavior mediating the empowerment–performance association [19]. At the system level, human resource management methods are regarded as organizational job

resources (including recruiting, training, performance appraisal, participation, and rewards) that boost performance through innovation and innovative work behavior [42]. At organizational support level, Gkontelos et al. [43] showed that transformational leadership has positive effect on employee performance directly and indirectly through innovative work behavior. Mehmood et al. [44] showed that transformational leadership has a significant effect on Millennials and Gen Z employees' performance through innovative work behavior. Other research suggest that corporate atmosphere promotes innovative work behavior that greatly boosts employee performance [45]. Likewise, social support from supervisors and colleagues is an important social resource that promotes innovative work behavior and therefore improves job performance indirectly, and this pathway is further strengthened by an inventive climate. Drawing on these theoretical reasons and practical facts, the following is proposed:

H6: Innovative work behavior mediates the relationship between job resources and job performance.

2.7. Mediating role of innovative work behavior in the relationship between job demands and job performance

Job pressures can be a stimulus for innovation as a coping reaction. Creatively challenged individuals find ways to fulfill objectives turning the possible strain of such demands into performance gains [39]. Innovative work behavior is thus a behavioral channel through which pressure is converted into productivity.

Empirical research has shown that certain job demands such as workload and time pressure [46], role ambiguity and role conflict [47], job insecurity [48], and work–family conflict [45] significantly affect innovative work behavior, either positively when perceived as challenges or negatively when perceived as hindrances. There is extensive research data on innovative work behavior, which suggests that it directly adds to job and task performance by allowing employees to change processes, discover new solutions, and increase the quality of work [32]. Interestingly, the mediation function of innovative work behavior in this association has been shown in multiple empirical research. Bao et al. [45] found that innovative behavior mediates the effect of job stress on employee performance. Mehmood et al. [44] confirmed that job stress has an indirect effect on performance through innovative work behavior. Zargar et al. [49] found that innovative work behavior significantly mediates the relationship between work-related stress and job performance among agricultural researchers. These results provide support for the thesis that job demands indirectly affect job performance through innovative work behavior of individuals. Based on these theoretical reasons and practical evidence, we argue that:

H7: Innovative work behavior mediates the relationship between job demands and job performance.

Based on the above analysis, the research team proposes the research model as shown in **Figure 1** below:

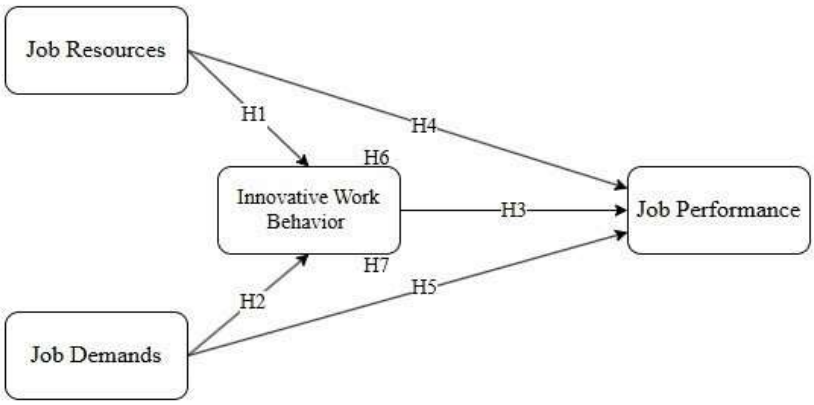

Figure 1. Research model.

Source: developed by the authors.

3. Methods

3.1. Measurement scales and questionnaire design

The measurement instruments employed in this study were adapted from validated scales established in prior empirical research. Specifically:

The measurement of job resources (JR) among faculty members was adapted from multiple validated sources. Specifically, items from Chang et al. [50] were utilized to capture three latent dimensions: Teaching resources (TR), administrative support (AS), and peer support (PS). Additional items reflecting relatedness with students (RWS) were adapted from Collie [51], while the dimensions of collective school culture (CSC) and value consonance (VC) were drawn from Skaalvik and Skaalvik [52]. In total, the job resources construct comprised 22 observed variables, encompassing both structural and social support aspects relevant to academic work environments.

The measurement of job demands (JD) was similarly developed from well-established scales. Drawing on Zargar et al. [49], three latent dimensions: time pressure (TP), disciplinary problems (DP), and low student motivation (LSM) were included. Items representing disruptive student behavior (DSB) were adopted from Collie [51], whereas the dimensions of teaching-research conflict (TRC) and new challenges (NC) were adapted from Han et al. [53]. These sources yielded a 22-item scale that captures both the psychological and workload-related pressures commonly experienced by academic staff.

Innovative work behavior was measured using a scale adapted from Dhar [54]. This construct comprised six observed variables. In addition, the measure of job performance was based on the instrument developed by Koopmans et al. [55], with necessary contextual modifications for the academic setting. This scale included 13 observed variables.

Across the seven hypotheses in the proposed research model, a total of 63 observed variables were included. The model consists of two independent variables (job resources and job demands), one mediating variable (innovative work behavior - IWB), and one dependent variable (job performance - JP), as illustrated in **Figure 1**.

All constructs were assessed using a five-point Likert-type scale, ranging from 1 = strongly disagree to 5 = strongly agree. This approach ensured consistent response

scaling across constructs and enhanced the comparability of measurement items.

3.2. Sampling and data collection

Data for this research were gathered from faculty members working in autonomous public universities in Vietnam, where the higher education system has been gradually moving towards more institutional autonomy and accountability. This scenario offers a pertinent context to evaluate the influence of job demands, job resources, and innovative behavior on academic success in an environment of organizational transformation and performance-based management.

The sample size of this study was calculated based on the specifications of Partial Least Square Structural Equation Modeling (PLS-SEM) technique utilizing SmartPLS 4. Barclay et al. [56] recommended the "10 times rule" which indicates that the minimum sample size should be at least 10 times the highest number of indicators associated with any latent feature in the model. In the study, to further check sufficiency, the advanced sample size estimation approaches developed by Kock and Hadaya [57] namely the inverse square root method and gamma-exponential method were also used. These methods resulted in minimum sample size estimations of 160 and 146 respectively. To achieve adequate representation and analytical robustness, 460 questionnaires were distributed by purposive selection targeting faculty members at autonomous public universities. After data cleaning and screening for completeness, a total of 432 valid responses were retained for the final analysis.

Quantitative data were evaluated using SmartPLS 4 following the methodological guidelines specified by Hair et al. [58]. The analysis methodologies comprised measurement reliability, convergent validity, discriminant validity and the subsequent structural model testing to measure the provided hypotheses.

To assess common method bias, Harman's single-factor test was conducted by loading all measurement items into an exploratory factor analysis with a fixed single-factor extraction and no rotation. The unrotated solution indicated that the first factor accounted for 24.3 % of the total variance, well below the 50 % threshold recommended by Podsakoff et al. [59]. This result suggests that common method bias does not pose a substantial threat to the validity of the findings.

4. Results

4.1. Sample characteristics

The survey respondents were faculty members working at autonomous public universities. Regarding gender, 36.8 % were male, 62 % were female, and 1.2 % chose not to disclose their gender. This distribution is consistent with the general pattern in education, where female participation tends to be predominant. In terms of age, the largest groups were those aged 30–40 and 40–50, each accounting for over 40 % of respondents. The 22–30 age group represented 8.1 %, while respondents over 50 years old accounted for 11.1 %. With respect to educational qualifications, 54.4 % held a Master's degree and 45.6 % held a Doctorate degree. In terms of work experience, 13.9% had less than five years of experience, 84.3 % had between five and ten years, and 1.9% had more than ten years. This suggests that the majority of participants

possessed substantial familiarity with higher education activities. Regarding academic disciplines, the largest proportion (46.5 %) specialized in business and management.

4.2. Measurement model assessment

Within the hypothesized research model, two second-order constructs were identified, job resources and job demands, each operationalized through six underlying dimensions. To capture the hierarchical nature of these constructs and examine the influence of independent variables on the dependent variable, the two-stage approach for second-order construct analysis was applied, following the procedures suggested by Hair et al. [58].

During the initial assessment, items IWB1, IWB3, AS4, and PS1 were removed because their outer loadings fell below the 0.708 threshold recommended by Hair et al. [58]. Cross-loading analysis further confirmed that these items did not load adequately on their intended constructs. Removal of these items improved both the composite reliability and the average variance extracted of the affected constructs without altering the conceptual coverage of the measurement instruments.

The assessment of the measurement model was conducted in two stages:

Stage 1: The measurement properties of the first-order constructs were examined to assess their reliability, convergent validity, and discriminant validity. Specifically, outerloadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) were evaluated to ensure that all constructs met the recommended thresholds (factor loadings ≥ 0.708, CR & Cronbach' Alpha ≥ 0.70, and AVE ≥ 0.50). Discriminant validity was further confirmed using the Fornell–Larcker criterion. The results of the measurement assessment are summarized in **Table 1** and **Table 2**.

Table 1. Results of measurement scale assessment.

Variables	Indicator	Outer loading	Cronbach' Alpha	CR	AVE
Innovative work behaviour (IWB)	IWB2	0.857	0.891	0.924	0.754
	IWB4	0.892			
	IWB5	0.857			
	IWB6	0.866			
Job performance (JP)	JP1	0.847	0.967	0.971	0.719
	JP2	0.888			
	JP3	0.860			
	JP4	0.783			
	JP5	0.870			
	JP6	0.855			
	JP7	0.877			
	JP8	0.853			
	JP9	0.753			
	JP10	0.897			
	JP11	0.827			
	JP12	0.810			
	JP13	0.890			

Table 1. (*Continued*).

Variables		Indicator	Outer loading	Cronbach' Alpha	CR	AVE
Job Resources (JR)	Teaching resource (JR_TR)	TR1	0.803	0.859	0.915	0.782
		TR2	0.927			
		TR3	0.917			
	Administrative support (JR_AS)*	AS1	0.925	0.927	0.948	0.820
		AS2	0.899			
		AS3	0.910			
		AS5	0.888			
	Peer support (JR_PS)*	PS2	0.904	0.836	0.902	0.755
		PS3	0.894			
		PS4	0.804			
	Relatedness with students (JR_RWS)	RWS1	0.908	0.940	0.957	0.847
		RWS2	0.924			
		RWS3	0.939			
		RWS4	0.909			
	Collective school culture (JR_CSC)	CSC1	0.921	0.914	0.946	0.854
		CSC2	0.918			
		CSC3	0.933			
	Value consonance (JR_VC)	VC1	0.927	0.916	0.947	0.856
		VC2	0.919			
		VC3	0.929			
Job Demands (JD)	Time pressure (JD_TP)	TP1	0.818	0.898	0.924	0.710
		TP2	0.872			
		TP3	0.871			
		TP4	0.849			
		TP5	0.800			
	Discipline problems (JD_DP)	DP1	0.893	0.888	0.931	0.818
		DP2	0.932			
		DP3	0.888			
	Low student motivation (JD_LSM)	LSM1	0.844	0.897	0.928	0.764
		LSM2	0.898			
		LSM3	0.871			
		LSM4	0.882			
	Disruptive student behaviour (JD_DSB)	DSB1	0.902	0.891	0.925	0.756
		DSB2	0.879			
		DSB3	0.898			
		DSB4	0.795			
	Teaching-research conflict (JD_TRC)	TRC1	0.861	0.851	0.910	0.770
		TRC2	0.904			
		TRC3	0.867			

Table 1. (*Continued*).

Variables	Indicator	Outer loading	Cronbach' Alpha	CR	AVE
New challenges (JD_NC)	NC1	0.845	0.707	0.837	0.632
	NC2	0.716			
	NC3	0.818			

* Several items were eliminated to ensure reliability and discriminant validity criteria.
Source: Smart PLS analysis.

As shown in **Table 2**, the diagonal elements (representing the square roots of AVE) are consistently higher than the corresponding inter-construct correlations in each row and column. These results demonstrate that no correlation between any pair of constructs exceeds the square root of the AVE for either construct, thereby confirming that discriminant validity is established for the measurement model [60].

Table 2. Fornell – Larcker criteria results.

Fornell – Larcker criterion														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
1. IWB	0.868													
2. JD_ DP	0.115	0.904												
3. JD_ DSB	0.033	0.726	0.870											
4. JD_ LSM	0.150	0.720	0.794	0.874										
5. JD_ NC	0.402	0.431	0.508	0.544	0.795									
6. JD_ TP	0.381	0.450	0.361	0.448	0.564	0.843								
7. JD_TRC	0.339	0.461	0.522	0.565	0.641	0.659	0.878							
8. JP	0.839	0.076	0.001	0.155	0.504	0.453	0.419	0.848						
9. JR_ AS	0.486	0.146	0.121	0.213	0.511	0.541	0.362	0.612	0.905					
10. JR_ CSC	0.535	0.149	0.094	0.184	0.481	0.536	0.358	0.647	0.869	0.924				
11. JR_ PS	0.594	0.149	0.120	0.196	0.500	0.479	0.344	0.670	0.851	0.811	0.869			
12. JR_RWS	0.567	0.114	0.052	0.177	0.521	0.594	0.390	0.702	0.881	0.889	0.811	0.920		
13. JR_ TR	0.593	0.113	0.083	0.169	0.536	0.478	0.348	0.705	0.863	0.845	0.819	0.852	0.884	
14. JR_VC	0.494	0.159	0.117	0.185	0.496	0.553	0.368	0.616	0.872	0.919	0.808	0.878	0.810	0.925

Source: Smart PLS analysis

Stage 2: In the second stage, the second-order constructs were assessed by assigning the latent variable scores of the first-order constructs to their corresponding higher-order constructs. This step allowed for the estimation of hierarchical relationships between the dimensions of job resources, job demands, and the outcome variables. The composite reliability and convergent validity of these higher-order constructs were then examined using the same criteria as in Stage 1. The measurement model for the second-order constructs is illustrated in **Figure 2**.

4.3. Structural model assessment

The Variance Inflation Factor (VIF) values for all constructs ranged from 2.319 to 4.194, which are well below the critical threshold of 5.0, indicating that no multicollinearity issues were present and that the model was suitable for subsequent

structural analysis [58].

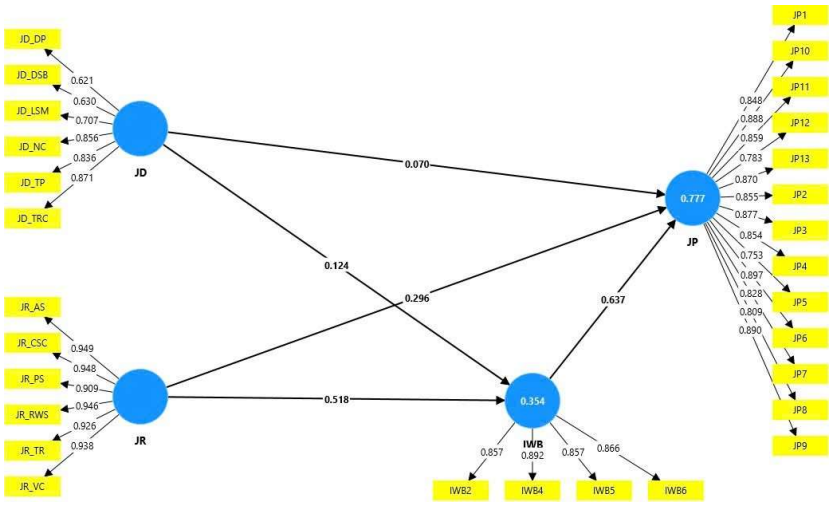

Figure 2. Measurement model in stage 2.

Source: Smart PLS analysis.

The results of the bootstrapping analysis for the direct hypotheses are summarized in **Table 3**. As shown, all five direct relationships were found to be statistically significant, with p-values ≤ 0.05 and t-values greater than 1.95, thereby providing empirical support for all proposed direct hypotheses (H1–H5).

Specifically, job resources exerted a strong positive effect on both innovative work behavior (Original sample = 0.518, $p < 0.001$) and job performance (Original sample = 0.295, $p < 0.001$). Similarly, job demands demonstrated a smaller but significant positive influence on innovative work behavior (Original sample = 0.124, $p < 0.01$) and job performance (Original sample = 0.070, $p < 0.05$). Finally, innovative work behavior showed a substantial positive effect on job performance (Original sample = 0.637, $p < 0.001$).

Table 3. Direct effects and hypothesis testing results.

Relationship	Hypothesis	Original sample	95% CI	Result
JR → IWB	H1	0.518***	[0.444,0.594]	Supported
JD → IWB	H2	0.124**	[0.031,0.200]	Supported
IWB → JP	H3	0.637***	[0.561,0.703]	Supported
JR → JP	H4	0.295***	[0.213,0.375]	Supported
JD → JP	H5	0.070*	[0.002,0.142]	Supported

P-value: * < 0.05, ** < 0.01, *** < 0.001

The results of the mediation analysis are presented in **Table 4**. The findings indicate innovative work behavior significantly mediates the relationships between both job resources and job demands with job performance.

Specifically, the indirect effect of Job resources on job performance through innovative work behavior was significant ($\beta = 0.330$, $p < 0.001$), while the direct effect remained significant ($\beta = 0.295$, $p < 0.001$), confirming a partial mediation effect.

Similarly, the indirect effect of job demands on job performance through

innovative work behavior was also significant ($\beta = 0.079$, $p = 0.005$), with a significant direct effect ($\beta = 0.070$, $p = 0.047$), indicating partial mediation as well. Therefore, H6 and H7 are supported. The final path coefficients and R^2 values of the structural model are illustrated in **Figure 3**.

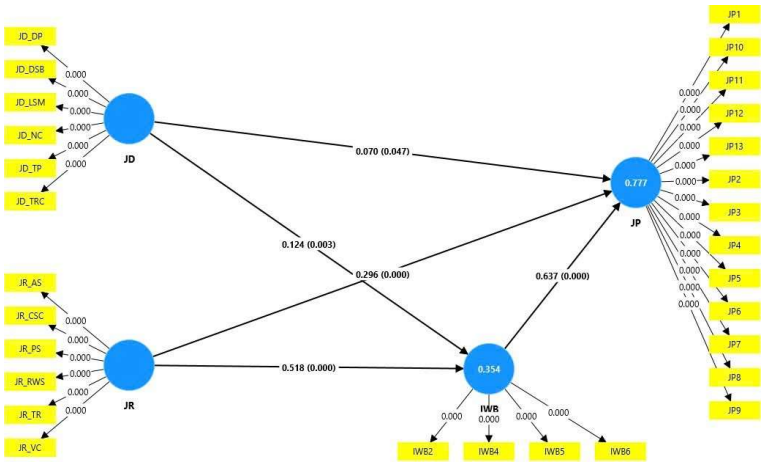

Figure 3. Structural model assessment results.

Source: Smart PLS analysis.

Table 4. Indirect effects and hypothesis testing results.

Relationships	Direct effect		Indirect effect		Total effect		Conclusion
	Original sample	*p*-value	Original sample	*p*-value	Original sample	*p*-value	
JR → IWB → JP	0.295	0.000	0.330	0.000	0.626	0.000	Partial mediation
JD → IWB → JP	0.070	0.047	0.079	0.005	0.150	0.000	Partial mediation

Source: Smart PLS analysis.

5. Discussion

The aim of the present study was to examine the relationship between job demands, job resources, innovative work behavior, and job performance within the framework of the Job Demands–Resources (JD-R) model. All proposed hypotheses were supported, providing strong empirical confirmation that the theoretical structure was valid. Specifically, analysis revealed that job demands and job resources were found to significantly influence innovative work behavior, which, in turn, positively predicted job performance. Additionally, the results also indicate that both job demands and job resources exerted direct effects on job performance, reinforcing their critical role in employee outcomes. Importantly, innovative work behavior was confirmed as a significant mediator in the relationships between (i) job demands and job performance, and (ii) job resources and job performance. These findings provide strong empirical confirmation that a dual-pathway mechanism exists, whereby both challenges and supports at work can simultaneously stimulate creativity and enhance performance. This aligns with and extends our knowledge of existing JD-R and innovation-related theories.

5.1. Theoretical implications

This study advances JD-R scholarship in three specific ways. First, it operationalizes both job demands and job resources as hierarchical second-order constructs, capturing structural heterogeneity such as: teaching resources vs. peer support; time pressure vs. disciplinary problems, that single-indicator or first-order specifications would obscure. Second, it positions innovative work behavior as a behavioral mediating mechanism, distinct from the psychological mediators (engagement, self-efficacy) that dominate the JD-R literature [14,61]. This distinction matters because innovative work behavior reflects observable, discretionary action rather than an internal psychological state, and therefore offers a more proximal link to measurable performance. Third, the study tests these mechanisms in a transitional higher education system (Vietnam) where simultaneous pressures toward institutional autonomy and research productivity create a distinctive demand-resource configuration that differs from the Western European and North American contexts in which the JD-R model was originally validated.

Besides its contribution to the JD-R model, this study also extends our understanding of the dynamic linkages between innovative work behavior and job performance that has received growing attention of organizational behavior researchers. Innovative work behavior plays a central role in organizational adaptation and long-term success [11,22]. Yet, empirical evidence relating innovative work behavior to job performance is fragmented and context-dependent. Our results robustly support the idea that innovation is a personal resource that individuals may leverage to enhance their employment performance by validating the direct and mediating role of innovative work behavior. This research adds to the existing literature by conceptualizing innovative work behavior as a behavioral process that converts contextual factors (job demands and resources) into performance outcomes. Unlike the earlier studies [62], the link between innovative work behavior and job performance is weak in our model. Especially, the supportive work settings promote the innovative work behavior, which leads to the greater job performance. These findings indicate the need of studying the individual performance consequences of innovative work behavior [63,64], especially in knowledge-intensive or innovation-driven work settings. The present study also fills a gap in the literature, by considering the innovative work behavior in a motivating framework to quantify creativity and innovation efforts.

One of the theoretical contributions of this study is the confirmation of the mediating function of innovative work behavior in the link between job demands, job resources and job performance. This finding offers further support for a behavioral mediation mechanism where ambient work factors have direct effects on outcomes and are mediated by proactive and creative task involvement. This is in line with the JD-R motivational pathway and indicates that innovative work behavior is a behavioral manifestation of this motivation. Active coping, which is the way employees creatively manage obstacles and opportunities, is measured by innovative work behavior, and not by psychological mediators such as job engagement or emotion [65]. This mediation relates job demands (strain) and job resources (motivation) to performance results via a single behavioral channel. This suggests a simultaneous

mediation model in which challenging and supporting work characteristics may influence creativity through different methods. The mediating role of innovative work behavior in both hindrance and challenge stressors contributes to the understanding of workplace innovation, suggesting that creativity can be the outcome of both well-calibrated demands and resource-full conditions. These results suggest that organizational design should prioritize the numerous motivational triggers of innovative behavior by balancing stress and excitement.

Finally, this study applies organizational behavior theories to the Sustainable Social Development field. By connecting the micro-mechanisms of the JD-R model to macro-level goals we experimentally show that improving daily work circumstances is a requirement for the delivery of Quality Education (SDG 4) and Decent Work (SDG 8). The study found that innovative work behavior is a sustained bridge between controllable work settings and long-term organizational performance, showing that sustainable macro-development must be deeply based in micro-level employee well-being.

5.2. Practical and policy implications for sustainable education

This study's findings have several key implications for organizational practice and for developing a sustainable academic ecosystem. First, the dual effect of job demands and job resources on innovative work behavior and job performance indicates the importance of a balanced job design approach by managers. Organizations should move away from considering job demands as stressors, but instead differentiate between impediment and challenge needs [66] and consciously design positions with a manageable amount of challenge. Properly calibrated demands can be employed as motivational triggers that activate staff innovation. At the same time, the availability of suitable employment resources, such as autonomy, supervisory support, and learning opportunities can further stimulate proactive and innovative behavior, leading to enhanced performance outcomes. Organizations may also want to try job crafting treatments [67] that enable employees to design their tasks and relationships to fit their strengths and promote creativity.

Secondly, the mediating function of innovative work behavior points to the necessity of fostering an organizational culture that clearly recognizes and promotes creativity at the individual level. Much of the research on creativity in firms has been focused on the team or organization. This study calls attention to the significance of innovation at the individual level and its direct influence on individual performance. Managers need to establish psychological safety, value creative efforts, and facilitate feedback loops that promote innovation. Moreover, training programs focusing on enhancing creative problem-solving skills, cognitive flexibility, and resilience could further empower employees to react positively to both demands and possibilities. In addition, from a strategic HRM viewpoint, the inclusion of innovation-related competencies in performance reviews and promotion criteria can also serve to align employee behavior with company goals. In summary, creating a positive and challenging workplace culture can inspire creativity and lead to measurable performance gains throughout the enterprise.

Creating a friendly yet engaging work environment means that faculty members

are not exposed to unsustainable burnout. Rather, faculty members are empowered to engage in decent work, driving the social and economic contributions of the University in a sustainable manner.

In the Vietnamese context, several actionable measures merit attention. University administrators could implement workload allocation models that cap weekly contact hours (e.g., 12–15 h) while reserving protected time for research. Structured mentorship programs pairing junior lecturers with senior researchers would function as a social resource that promotes both skill transfer and innovative practice. Professional development budgets tied to performance review outcomes, rather than seniority, could redirect institutional resources toward faculty members who demonstrate innovation capacity. Finally, cross-functional teaching teams, mixing disciplines within a single course module, can transform teaching-research conflict from a hindrance demand into a challenge demand by exposing lecturers to new methodologies and collaborative opportunities.

The findings map onto specific SDG targets. The positive effect of job resources on innovative work behavior aligns with Target 4.c, which calls for increasing the supply of qualified teachers through professional development and supportive working conditions. The significant relationship between job demands and performance corresponds to Target 8.5, which emphasizes productive employment and decent work for all. The mediating function of innovative work behavior bridges these two targets: when lecturers receive adequate resources (Target 4.c) and experience manageable demands (Target 8.5), they generate pedagogical and research innovations that sustain educational quality over time.

6. Conclusion

The present research validated the suggested model by testing the links among job demands, job resources, innovative work behavior and job performance in the JD-R framework. All hypotheses were supported. This means both job demands and job resources have considerable positive effect on lecturers' inventive behavior and job performance. The results revealed that innovative work behavior is a significant mediating mechanism into enhanced job performance. In conclusion, the study offers a better knowledge of the interaction of job needs and resources in influencing the innovative behavior and job performance of lecturers. These results show how important it is to have balanced job demands and resources for both challenge and incentive.

Although the study has successfully demonstrated theoretical and practical contributions, this study is not without limitations. The cross-sectional approach limits the causal inferences between workplace demands/resources, innovative work behavior and job performance. Structural equation modeling (SEM) provided a strong description of directed paths but was ambiguous in terms of temporal ordering. Future research should employ longitudinal or experimental approaches to better understand the dynamic features of relationships, particularly the change in innovative work behavior in response to changing working settings. The use of panel data can help to separate reciprocal or lagged effects within the context of the JD-R, and therefore to better understand the mechanisms underpinning causality.

A second limitation is the potential limited generalizability due to the cultural and organizational milieu within which data were acquired. The sample is from Vietnam, which may influence employees' perception of needs, resources and innovation potential because of the existence of hierarchical work cultures and contextual workplace norms. Future research might repeat this method in public organizations, high-tech corporations, and startups to confirm and validate these findings. Cross-national samples or comparative research might give new insight into how cultural variables such as power distance and uncertainty avoidance modify these connections.

Third, the operationalization of job demands as a single second-order construct merits scrutiny. The six first-order dimensions span conditions that the challenge-hindrance framework classifies differently: time pressure and new challenges are typically appraised as growth opportunities, whereas disciplinary problems and low student motivation function as obstacles that deplete cognitive resources [68,69]. Aggregating these dimensions into one composite may mask countervailing effects, because challenge demands tend to increase engagement while hindrance demands tend to suppress it [70]. The overall positive coefficient observed for the job demands construct likely reflects the dominance of challenge-type items in the composite, and the small magnitude of these coefficients is consistent with opposing sub-effects partially canceling one another. Future research should model challenge and hindrance demands as separate second-order constructs and employ bifactor or latent profile analysis to disentangle their distinct mechanisms.

Fourth, nearly half of the respondents (46.5%) were from business and management disciplines. Faculty members in STEM, social sciences, and humanities may experience different demand-resource configurations because research requirements, class sizes, and performance metrics vary across fields. Subsequent studies should stratify by discipline or employ quota sampling to ensure balanced representation.

Fifth, the study was limited by the over-rely on self-report methods, which may contain method bias and social desirability effects. Future studies should adopt a multi-source or multi-method approach to reduce bias, even when using anonymity and the separation of scales. To verify the external validity of subjective performance ratings, researchers might add objective performance measures such as innovation outputs, project completion rates, and customer happiness. Addressing these constraints would enhance the theoretical accuracy and empirical validity of future researches on the processes by which work design influences inventive behavior and employee performance.

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