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Core job characteristics and organizational commitment among Vietnamese educators: integrating the stimulus-organism-response framework with necessary condition analysis

Dang Thien Tam^a , Truong Thi Phuong Kieu^a, Le Tan Anh Huy^a, Nguyen Thuy Anh^a, Nguyen Thi Hoai Oanh^a, Dang Thanh Dung^a, Nguyen Thi Thu Hang^{a,b}, Nguyen Thi Thao^{a,c} and Hai Nguyen Ngoc Dang^{d,e} 

^aFaculty of Marketing, Duy Tan University, Da Nang, Vietnam; ^bFaculty of Economics - Finance, Duy Tan University, Da Nang, Vietnam; ^cFaculty of Business Administration, Duy Tan University, Da Nang, Vietnam; ^dInstitute of Research and Development, Duy Tan University, Da Nang, Vietnam; ^eMenzies Institute for Medical Research, University of Tasmania, Hobart, Australia

ABSTRACT

Despite extensive research on core job characteristics and organizational commitment (OCM), important gaps persist in educational institutions. Specifically, how job characteristics translate into commitment through psychological mechanisms remains unclear. Moreover, the threshold-based conditions under which these relationships emerge are poorly understood. This study addresses these gaps by integrating partial least squares structural equation modeling and necessary condition analysis (NCA) within the stimulus-organism-response framework. The analysis includes 697 Vietnamese educators. Results indicate that core job characteristics are strongly associated with workplace satisfaction ($\beta=0.69$) and job satisfaction ($\beta=0.62$). Core job characteristics also show a smaller but statistically significant association with OCM ($\beta=0.24$). Workplace satisfaction appears to be the primary statistical pathway linking core job characteristics to OCM, whereas job satisfaction does not show a significant mediating role. The workplace satisfaction-OCM association appears stronger at higher person-organization fit levels. NCA identifies minimum threshold conditions for skill variety, task identity, task significance, and feedback. These conditions must reach minimum levels for high OCM to occur. By showing that OCM depends on both linear net effects and threshold conditions, this study advances job design theory and provides practical strategies for managing commitment in professionalized educational settings.

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1. Introduction

The period from 2022 to 2024 marked a relative recovery of Vietnam's labor market. However, structural vulnerabilities remain pronounced, particularly within the education sector. According to the Ministry of Education and Training (Ministry of Education & Training of Viet Nam, 2024; Prime Minister of Viet Nam, 2025), Vietnam is facing a severe shortage of educators as growing numbers of teachers retire or leave the profession, while student enrollment continues to expand. These pressures have coincided with profound post-COVID-19 disruptions. In particular, the phenomenon known as the 'Great Resignation' initially documented in Western economies has become increasingly visible within the education sector. This trend is reflected in rising turnover intentions among educators, driven by occupational burnout, intensified pressure for international research publications, and a declining perception of organizational support (Schmiedehaus et al., 2023; Watermeyer et al., 2025). Collectively, these dynamics pose substantial challenges to sustaining organizational commitment (OCM) within education systems.

In the Vietnamese context, such challenges are further amplified by the ongoing process of university autonomy. This transformation has been institutionalized through Vietnam's Law on Higher Education

CONTACT Hai Nguyen Ngoc Dang  hai.dang@utas.edu.au  ngochai123dc@gmail.com  Menzies Institute for Medical Research, University of Tasmania, Hobart, Australia; Institute of Research and Development, Duy Tan University, Da Nang, Vietnam

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(as amended) and key Party and Government resolutions on university autonomy and accountability, which emphasize enhanced institutional self-governance in academic, financial, and human resource domains (National Assembly of the Socialist Republic of Viet Nam, 2018; Politburo of the Communist Party of Viet Nam, 2025). While university autonomy has enabled education institutions to adopt more flexible development strategies, it has simultaneously intensified workload, performance expectations, and competitive pressures among teaching staff. Against this backdrop, these dynamics raise urgent concerns about the sustainability of educators' OCM under conditions of high work intensity and constrained resources. Under such conditions, a fair and transparent work environment may operate not only as a source of motivation but also as a necessary condition shaping educators' retention or withdrawal decisions.

Despite the long-standing recognition of job design as a key determinant of employee attitudes and behaviors, important gaps remain in the literature on educators' OCM. First, much of the empirical evidence has been drawn from industrial sectors or Western contexts, limiting its applicability to education systems in emerging economies. Second, prior studies have often emphasized job satisfaction (JS) as a central mediating mechanism linking job characteristics to work-related outcomes, while giving less attention to alternative attitudinal pathways (Crede et al., 2007; Hagen et al., 2025). In educational settings, especially in rapidly transforming labor markets such as Vietnam, empirical evidence distinguishing JS from workplace satisfaction (WS) remains limited. This constrains a more nuanced understanding of educators' OCM, as satisfaction with the work itself may not necessarily align with satisfaction with the broader organizational environment. Third, much of the extant literature has relied on symmetric, additive, sufficiency-based approaches that estimate net effects, while giving limited attention to necessity logic and bottleneck conditions (Dul, 2016; Richter & Hauff, 2022; Troiville et al., 2025). As a result, limited insight is available into whether particular job characteristics or satisfaction conditions are necessary for achieving high OCM.

The selection of JS and WS as mediators is grounded in the stimulus-organism-response (S-O-R) framework and the job characteristics model (JCM). In the S-O-R logic, job characteristics represent work-related stimuli that are associated with employees' internal evaluative states before being linked to organizational responses (Mehrabian & Russell, 1974). JS captures educators' job-focused evaluation of their teaching roles, whereas WS reflects broader evaluations of the workplace environment, including support, communication, recognition, and professional climate (Lee & Brand, 2005; Locke, 1976; Weiss & Cropanzano, 1996). This distinction is important because educators may be satisfied with teaching itself while evaluating their employing institutions differently. Importantly, the S-O-R organism is not a single state. The JCM holds that job characteristics are theorized to generate experienced meaningfulness, responsibility, and knowledge of results (Hackman & Oldham, 1976), and these states may then be appraised either relative to the work itself, where they are reflected in JS (Locke, 1976), or relative to the organizational context, where they are reflected in WS (Lee & Brand, 2005; Weiss & Cropanzano, 1996). Because OCM is an organization-directed bond (Meyer & Allen, 1991), the compatibility principle suggests that the organization-referenced state of WS is the more proximal pathway to commitment, whereas the job-referenced state of JS remains comparatively off-target (Lavelle et al., 2007). This logic is especially relevant for educators, whose job-focused satisfaction is often rooted in a professional identity that extends beyond a single institution (Mowday, 1998). We therefore theorize *a priori* that WS, rather than JS, is the primary evaluative pathway linking job characteristics to educators' OCM. Furthermore, person-organization fit (POF) is included as a moderator because the association between satisfaction and OCM may depend on value congruence between employees and their institutions. When perceived fit is high, positive job and workplace evaluations are more likely to be associated with stronger organizational attachment (Cable & DeRue, 2002; Kristof, 1996; O'Reilly et al., 1991).

These limitations are especially relevant when viewed through the lens of the JCM, which provides a foundational framework for understanding how job design shapes employees' work experiences. Conceptualized as a multidimensional model, JCM emphasizes the roles of skill variety, task identity, task significance, autonomy, and feedback in shaping key psychological states and subsequent work attitudes (Hackman & Oldham, 1976). Although numerous studies have confirmed the positive effects of job characteristics on satisfaction and OCM, most have adopted an additive and linear perspective, implicitly assuming that more is always better (Fried & Ferris, 1987; Humphrey et al., 2007). Yet this assumption

may be inadequate in post-pandemic and institutionally restructured contexts, where employees may respond positively only after certain job attributes reach minimum threshold levels.

Recent methodological advances suggest that organizational phenomena may be governed not only by sufficient conditions but also by necessary conditions that create structural ‘bottlenecks’ in outcome formation (Dul, 2016). In education systems undergoing rapid reform, such as Vietnam, these noncompensatory mechanisms may be particularly salient, as increased professional mobility, uneven human resource practices, and heightened performance pressures may exacerbate threshold effects. However, empirical evidence on such mechanisms remains limited, especially in non-Western educational contexts.

To address these theoretical and methodological gaps, the present study investigates the associations between job characteristics and educators’ OCM in Vietnamese education. By integrating the S-O-R framework with JCM, this study advances the literature in three key ways. First, it empirically differentiates JS and WS as distinct mediating mechanisms linking job characteristics to OCM. Second, it examines the moderating role of POF, thereby accounting for individual-organizational alignment in shaping commitment under conditions of heightened work intensity and limited resources. Third, methodologically, the study combines partial least squares structural equation modeling (PLS-SEM) with necessary condition analysis (NCA) to identify both average effects and indispensable threshold conditions underlying educators’ OCM.

In light of these considerations, this study is guided by the following research questions:

- **RQ1:** How is the higher-order core job characteristics construct associated with educators’ OCM in post-pandemic Vietnamese education?
- **RQ2:** To what extent do JS and WS mediate the relationship between core job characteristics and educators’ OCM?
- **RQ3:** Does POF moderate the relationships between satisfaction states (JS and WS) and OCM in educational institutions?

Accordingly, this study pursues four specific objectives: to examine the associations of JCM with educators’ JS, WS, and OCM; to test the statistical mediating roles of JS and WS; to assess the moderating role of POF; and to apply NCA to identify necessary threshold conditions for high OCM. By addressing these questions and objectives, this study extends the applicability of JCM to educational settings in emerging economies and provides theoretically grounded and methodologically robust insights into OCM in the context of post-pandemic and institutional transformation.

2. Theoretical framework

2.1. Job characteristics model

The JCM developed by Hackman and Oldham (1976) is a foundational framework for understanding how job design influences employee motivation, attitudes, and performance. Building on Herzberg’s two-factor theory (Herzberg et al., 1959), the JCM distinguishes between work conditions and the intrinsic nature of work. It emphasizes that core job characteristics are central to meaningful and motivating work experiences. The core job characteristics, according to JCM, are skill variety, task identity, task significance, autonomy, and job-related feedback, which are central to employees’ psychological experiences at work (Hackman & Oldham, 1976). Skill variety reflects the extent to which a job requires diverse skills and abilities, whereas task identity refers to completing a whole and identifiable piece of work. Task significance captures the perceived impact of a job on others, autonomy represents the degree of freedom and discretion in performing work tasks, and feedback concerns the extent to which employees receive clear information about their job performance.

According to the JCM, these job characteristics are theorized to be associated with work-related outcomes through three critical psychological states: experienced meaningfulness of the work, experienced responsibility for work outcomes, and knowledge of results (Hackman & Oldham, 1976). Skill variety, task identity, and task significance enhance experienced meaningfulness; autonomy strengthens experienced

responsibility; and feedback increases knowledge of results. These psychological states subsequently lead to favorable outcomes such as higher JS, stronger intrinsic motivation, and improved job performance.

Substantial empirical evidence supports the validity of the JCM. A seminal meta-analysis by Fried and Ferris (1987) demonstrated significant relationships between job characteristics and key attitudinal and behavioral outcomes. More recent meta-analytic research has further confirmed the robustness of work design effects across diverse organizational contexts (Humphrey et al., 2007). Collectively, these findings underscore the enduring relevance of the JCM as a robust theoretical foundation for examining the mechanisms through which job design shapes employee attitudes and behavior.

2.2. Stimulus-organism-response framework

Another important theoretical framework underpinning this study is the S-O-R model, originally developed by Mehrabian and Russell (1974). Rooted in environmental psychology, the S-O-R model explains how external environmental stimuli may be associated with individuals' internal cognitive and affective processes, which are subsequently linked to specific behavioral responses. This framework has been widely applied not only in consumer behavior research but also in studies examining behavior within organizational contexts.

In the present study, the S-O-R framework is employed to explain the mechanism through which job characteristics may be statistically associated with employees' OCM. Specifically, the five core dimensions of JCM (skill variety, task identity, task significance, autonomy, and feedback) are conceptualized as environmental stimuli representing job-related factors. These stimuli are theorized to be associated with employees' internal psychological states, captured by JS and WS, which function as the organism component of the S-O-R model. In turn, these internal evaluations and affective states are linked to employees' OCM, which represents the response component of the framework. This conceptualization highlights the indirect statistical pathway linking job characteristics to OCM through employees' internal psychological processes.

2.3. Organizational commitment

OCM has received considerable scholarly attention over the past several decades, particularly within research-oriented organizations (Meyer & Allen, 1991; Mowday, 1998). It is commonly defined as an individual's psychological attachment to, or linkage with, an organization (Mathieu & Zajac, 1990). Sustained interest in OCM stems from evidence suggesting that employees with higher levels of commitment are more likely to exhibit desirable work-related outcomes, including enhanced job performance, stronger organizational citizenship behaviors, and lower withdrawal tendencies (Jaros, 1997). From an attitudinal perspective, OCM reflects the extent to which employees identify with organizational goals and values and are willing to exert effort on behalf of the organization (Herscovitch & Meyer, 2002). Empirical evidence has consistently linked OCM to key attitudinal and behavioral outcomes, such as JS, turnover intention, absenteeism, and job performance (Mathieu & Zajac, 1990; Meyer et al., 2002). Building on this conceptual foundation, Meyer and Allen (1991) proposed a three-component model of OCM consisting of affective, continuance, and normative commitment. Affective commitment refers to employees' emotional attachment to and identification with the organization, which fosters cooperation and sustained effort toward organizational goals. Continuance commitment is grounded in employees' perceptions of the costs associated with leaving the organization, including accumulated investments such as time, effort, and organization-specific skills, leading individuals to weigh the benefits of staying against the potential losses of departure. In contrast, normative commitment arises from a sense of moral obligation to remain with the organization, particularly when there is congruence between employees' personal values and those of the organization. Taken together, this three-component framework offers a comprehensive lens for understanding how distinct forms of OCM influence employees' attitudes and behaviors within organizational settings.

2.4. Conceptual framework

The proposed model is theoretically anchored in an integrative framework that synthesizes the JCM (Hackman & Oldham, 1976) with the S-O-R paradigm (Mehrabian & Russell, 1974), as presented in Figure

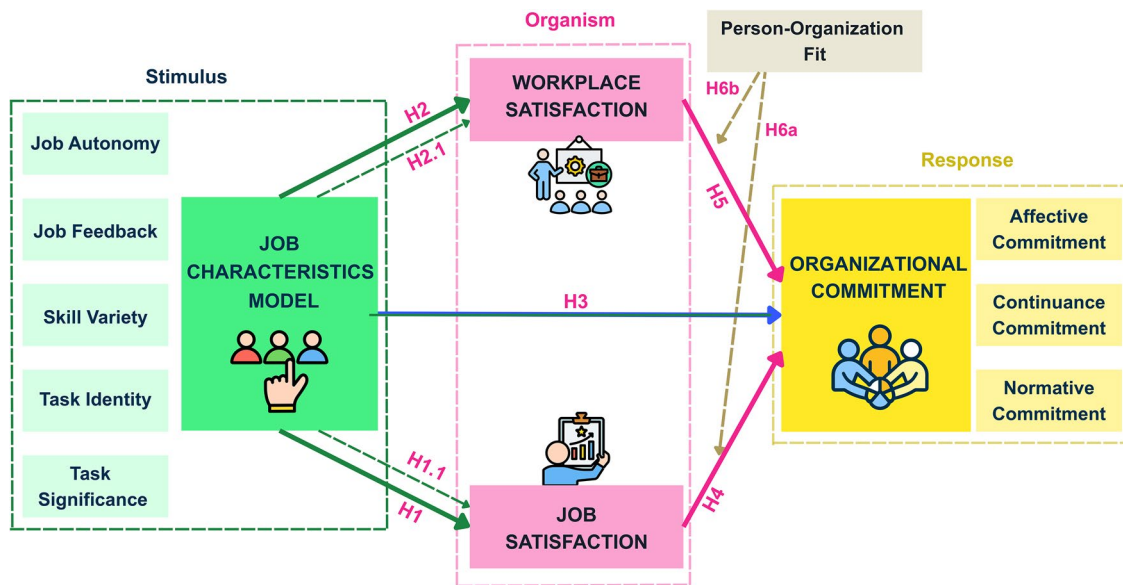


Figure 1. The proposed research model. Hypothesized relationships among the job characteristics model (JCM), job satisfaction (JS), workplace satisfaction (WS), person-organization fit (POF), and organizational commitment (OCM). Solid arrows indicate direct hypothesized associations, whereas dashed arrows indicate indirect mediation pathways. H1: JCM is positively associated with employees' JS. H2: JCM is positively associated with employees' WS. H3: JCM is positively associated with employees' OCM. H4: JS is positively associated with employees' OCM. H5: WS is positively associated with employees' OCM. H1.1: JCM has a positive indirect association with OCM through JS. H2.1: JCM has a positive indirect association with OCM through WS. H6a: POF moderates the relationship between JS and OCM. H6b: POF moderates the relationship between WS and OCM. OCM comprises affective, continuance, and normative commitment.

1. From this standpoint, JCM is conceptualized as a set of job-related environmental stimuli comprising skill variety, task identity, task significance, autonomy, and feedback (Hackman & Oldham, 1976). These job characteristics are theorized to be associated with employees' internal psychological states, reflected in JS and WS, which constitute the organism component of the model (Lee & Brand, 2005; Locke, 1976; Weiss & Cropanzano, 1996). JS and WS are included as parallel mediators because they capture distinct attitudinal pathways: JS reflects educators' job-focused evaluations, whereas WS reflects broader workplace evaluations, allowing this study to clarify whether job characteristics are statistically linked to OCM through JS, WS, or both. In turn, these internal evaluative and affective states are linked to employees' OCM, including affective, continuance, and normative commitment (Meyer & Allen, 1991). In this study, OCM is specified as a reflective higher-order construct because its three components are regarded as interrelated manifestations of an underlying latent commitment orientation rather than as mechanically constitutive components that jointly form commitment. Accordingly, a reflective-reflective specification is appropriate and consistent with established research practice when the higher-order construct represents a generalized attitudinal state. In addition to these indirect statistical pathways, job characteristics are also expected to be directly associated with OCM (Mathieu & Zajac, 1990). Based on this theoretical foundation, the present study formulates nine hypotheses covering direct associations, statistical mediating pathways, and moderating relationships among JCM, JS, WS, POF, and OCM. Grounded in the JCM, overall JCM is hypothesized to be positively associated with JS (H1), WS (H2), and OCM (H3). Drawing on the S-O-R framework, JS and WS are conceptualized as internal evaluative states linking job-related stimuli to OCM. Therefore, JS (H4) and WS (H5) are hypothesized to be positively associated with OCM, while JS (H1.1) and WS (H2.1) are proposed to statistically mediate the association between JCM and OCM. Finally, POF is proposed as a boundary condition in the satisfaction-commitment association; accordingly, POF is hypothesized to moderate the association between JS and OCM (H6a) and between WS and OCM (H6b). Detailed theoretical justifications for these hypotheses are provided in [Supplementary Document S1](#).

3. Materials and methods

3.1. Data collection process

This study adopted purposive sampling to recruit participants whose characteristics matched the research objectives, thereby ensuring a relatively homogeneous sample appropriate for examining theoretical relationships and moderating effects (Jager et al., 2017; Palinkas et al., 2015). The target population consisted of full-time lecturers/teachers employed under labor contracts across different types of educational institutions in Da Nang, Vietnam, including preschools, primary schools, lower secondary schools, upper secondary schools, colleges/universities, language centers, life-skills centers, and vocational/test-preparation centers. The study was conducted in Da Nang, a principal educational hub of Central Vietnam marked by post-pandemic workforce adjustment, retention pressures, and an ongoing transition toward greater institutional autonomy, the latter institutionalized through the amended Law on Higher Education and recent Party and Government resolutions (National Assembly of the Socialist Republic of Viet Nam, 2018). All respondents were full-time teaching staff under formal labor contracts, spanning general education (preschool to upper secondary, 46.6%), higher education (41.6%), and center-based institutions (11.8%); the full distribution is reported in [Supplementary Table S1](#). The study protocol received approval from the Institutional Review Board of Duy Tan University (No. DTU/REC2025/NHH07, approved on 30 June 2025), and written informed consent was obtained from all participants before data collection. Data were collected from 8 August to 10 December 2025.

3.2. Sample size, data screening, and final analytical sample

Sample size adequacy was assessed using G*Power software version 3.1.9.7 (Germany). An a priori power analysis was conducted using the *t* tests family and the correlation bivariate normal model, with a two-tailed design, an expected correlation effect size of $r=0.15$, $\alpha=0.05$, and statistical power = 0.95. This analysis indicated a minimum required sample size of 569 participants. Because post hoc power calculations are generally not recommended for interpreting completed studies, the adequacy of the sample is reported on the basis of the a priori power analysis, alongside effect sizes and confidence intervals (Fink, 2013; Hoenig & Heisey, 2001).

Of the 799 questionnaires initially received, 92 were removed due to straight-lining and missing data. Because NCA is sensitive to extreme observations (Dul, 2016), multivariate outliers were identified using Mahalanobis distance in IBM SPSS Statistics software version 27.0 (United States) at $p<0.001$. After excluding 10 outliers, the final sample comprised 697 valid responses. Female respondents represented 56.8% of the sample; most participants held a master's degree (65.9%), and the most represented age group was 31–35 years (42.9%). Detailed demographic information is provided in [Supplementary Table S1](#).

3.3. Measurement procedure

All the measurement items were adapted from well-established and validated scales to ensure content validity. JCM was operationalized as a multidimensional construct comprising five dimensions: skill variety, task identity, task significance, autonomy, and feedback (Hackman & Oldham, 1976). JS was measured via six items adapted from prior studies (Eryilmaz et al., 2025; Locke, 1976; Veldman et al., 2013), whereas WS was assessed via eight items adapted from previous research (Bogler, 2001; Weiss & Cropanzano, 1996). POF was measured via six items adapted from prior validated scales (Cable & DeRue, 2002; Hassan et al., 2012). Finally, OCM was assessed via Meyer and Allen (1991) three-component model of affective, continuance, and normative commitment, with five items per dimension.

All the elements were assessed on a five-point Likert scale (1=strongly disagree; 5=strongly agree). All scales were translated into Vietnamese and independently back-translated by bilingual researchers, with discrepancies reconciled by the research team to ensure conceptual and linguistic equivalence (Brislin, 1970). A pretest with 30 participants validated item clarity, followed by a pilot study involving 95 individuals, consistent with pilot-study sample size recommendations (Hertzog, 2008). No major issues related to item clarity or wording were identified. The full measurement constructs are documented in

Supplementary Table S2, and descriptive statistics for the measurement items are provided in Supplementary Table S3.

3.4. Data analysis

The analysis was conducted via PLS-SEM to estimate higher-order constructs and assess both mediation and moderation effects in line with the proposed conceptual framework. The measurement and structural frameworks were evaluated via PLS-SEM in Smart-PLS software version 4.1.0.9 (Germany). The path weighting scheme was applied, with a maximum of 300 iterations and a stop criterion of 10^{-7} . Bootstrapping with 5,000 subsamples was used to produce bias-corrected and accelerated confidence intervals, using two-tailed tests at the 5% level. Mardia's skewness and kurtosis assessments indicated significant multivariate nonnormality ($p < 0.001$), thereby rationalizing the application of PLS-SEM owing to its resilience (Hulland, 1999; Mardia, 1970).

JCM was specified as a formative higher-order construct, whereas OCM was modeled as a reflective higher-order construct. The disjoint two-stage approach was applied (Sarstedt et al., 2019): in the first stage, latent variable scores of all lower-order constructs were estimated. In the second stage, these scores were used as formative indicators for JCM and as reflective indicators for OCM.

In addition, NCA was employed to identify conditions that are required for achieving high levels of the outcome variables. The ceiling envelopment-free disposal hull (CE-FDH) technique was applied for discrete survey data measured on Likert-type scales (Dul, 2016). The statistical significance of the necessity effects was tested with a permutation test using 5,000 permutations.

4. Results

4.1. Common method variance

To reduce potential common method variance (CMV), procedural remedies were applied. The questionnaire used clear and concise wording, avoided sensitive items, and ensured respondent anonymity. Because the study used single-source self-reported survey data, CMV cannot be fully ruled out. As an additional diagnostic check, inner model collinearity was assessed. The variance inflation factor (VIF) values ranged from 1.382 to 2.153, below the conservative threshold of 3.0, indicating that multicollinearity was not a serious concern in the structural model (Supplementary Table S4). Therefore, collinearity-related bias was unlikely to substantially affect the estimated relationships.

4.2. Assessment of the measurement model

The measurement framework was rigorously examined to ensure that all indicators satisfied the required reliability and validity criteria prior to the assessment of the structural model. The initial evaluation of the measurement model indicated generally acceptable indicator loadings, although several items did not meet the recommended threshold and were therefore refined (Hair et al., 2021). Indicators with low loadings that weakened reliability or average variance extracted (AVE) were removed iteratively, while theoretically important borderline items were retained when composite reliability and AVE remained satisfactory. For the focal mediators, this yielded final five-item measures for JS (JS2 removed) and WS (WS5, WS7, and WS8 removed). Following refinement in the subsequent iteration, all lower-order reflective indicators manifested enhanced loadings ranging from 0.70–0.84, corroborating satisfactory indicator reliability. Furthermore, multicollinearity diagnostics utilizing the VIF yielded values less than 3, confirming the absence of multicollinearity complications. Reliability and convergent validity were substantiated through composite reliability and AVE. As shown in Table 1, the composite reliability values ranged from 0.79–0.86, significantly exceeding the 0.70 benchmark, whereas the AVE values ranged from 0.50–0.60, surpassing the 0.50 threshold (Fornell & Larcker, 1981). These outcomes indicate acceptable composite reliability and adequate convergent validity across the constructs. Detailed item loadings, reliability coefficients, and validity statistics are presented in Supplementary Tables S5 and S6.

Table 1. Assessment of the reliability and convergent validity.

Assessment measure	Criterion	Threshold	Result
Indicator reliability	Factor loadings	>0.70	0.70–0.84
Multicollinearity	Variance inflation	<3.00	Below 3.00
Composite reliability	Internal consistency	>0.70	0.79–0.86
Average variance extracted	Convergent validity	>0.50	0.50–0.60
Heterotrait-Monotrait ratio	Discriminant validity	<0.90	0.629–0.844

Table 2. Assessment of discriminant validity.

Fornell-Larcker criterion	JS	OCM	POF	WS
JS	0.731			
OCM	0.473	0.764		
POF	0.529	0.591	0.734	
WS	0.568	0.538	0.517	0.727
Heterotrait-Monotrait ratio	JS	OCM	POF	WS
OCM	0.629			
POF	0.717	0.844		
WS	0.715	0.733	0.694	

Note: The diagonal elements (in bold) are the square roots of AVE ($\sqrt{\text{AVE}}$) for each construct. Heterotrait-Monotrait ratio < 0.90. WS, workplace satisfaction; JS, job satisfaction; OCM, organizational commitment; POF, person-organization fit.

Table 3. Model fit.

	Saturated model	Estimated model
Standardized root mean square residual	0.076	0.088
Squared Euclidean distance	1.454	1.981
Geodesic distance	0.352	0.379
Chi-square	1395.465	1446.391
Normed fit index	0.750	0.741

SRMR, standardized root mean square residual; d_ULS, squared Euclidean distance; d_G, geodesic distance; NFI, normed fit index.

Discriminant validity is used to determine whether a reflective indicator is a good measure of its construct on the basis of the principle that each indicator should be highly correlated with only its corresponding construct. To assess discriminant validity, both the Fornell-Larcker criterion (Fornell & Larcker, 1981) and the Heterotrait-Monotrait ratio (Henseler et al., 2015) were used. As shown in Table 2, the square roots of the AVE ($\sqrt{\text{AVE}}$) on the diagonal were greater than the corresponding interconstruct correlations, satisfying the Fornell-Larcker criterion. Additionally, all the Heterotrait-Monotrait ratios were less than 0.90 (Kline, 2016), and none of their 95% bootstrap confidence intervals included the value of 1, confirming discriminant validity (Supplementary Table S7).

The formative higher-order construct of JCM was assessed using outer weights, bootstrapped significance, and collinearity diagnostics. The outer weights of job autonomy, job feedback, skill variety, task identity, and task significance were all positive and statistically significant, ranging from 0.198 to 0.443. The VIF values ranged from 1.382 to 1.678, below the recommended threshold, indicating that multicollinearity among the lower-order dimensions was not a serious concern. These results suggest that the five dimensions make meaningful contributions to JCM. For the reflective higher-order construct of OCM, affective commitment and continuance commitment showed strong outer loadings of 0.848 and 0.805, respectively, whereas normative commitment exhibited a lower but acceptable loading of 0.619. Although the loading of normative commitment was below the commonly recommended threshold of 0.70, it was retained because of its theoretical relevance to OCM and because the overall reliability and convergent validity of OCM were acceptable. Specifically, OCM demonstrated satisfactory internal consistency and convergent validity, with Cronbach's $\alpha = 0.710$, $\rho_A = 0.700$, composite reliability = 0.805, and AVE = 0.583. Detailed results are presented in Supplementary Table S8.

The results in Table 3 indicate that the model fit indices were mixed but still interpretable within the PLS-SEM context. Although the saturated model shows an SRMR of 0.076, which is below the recommended threshold of 0.08, the estimated model has an SRMR of 0.088, slightly above the cutoff. Moreover, the squared Euclidean distance value was 1.981 and the geodesic distance value was 0.379, both of which fell within acceptable ranges, whereas the normed fit index value was 0.741, below the 0.90

Table 4. R^2 , adjusted R^2 , Q^2 predict, and prediction error metrics.

	R^2	R^2 adjusted	Meaning	Q^2 predict	RMSE	MAE
JS	0.388	0.387	moderate	0.384	0.787	0.616
OCM	0.467	0.462	moderate	0.437	0.753	0.582
WS	0.474	0.473	moderate	0.471	0.730	0.560

Note: According to Chin (1998), R^2 values of 0.67, 0.33, and 0.19 indicate strong, moderate, and weak predictive power, respectively. WS, workplace satisfaction; JS, job satisfaction; OCM, organizational commitment; Q^2 predict, predictive relevance statistic; RMSE, root mean square error; MAE, mean absolute error.

Table 5. Assessment of the structural model.

Hypothesis and path	Coefficient	t-Stat	BCaCI	f^2	p Value	Remarks
H ₁ : JCM → JS	0.62	24.70	[0.57–0.66]	0.63	<0.001	Supported
H ₂ : JCM → WS	0.69	29.72	[0.64–0.73]	0.90	<0.001	Supported
H ₃ : JCM → OCM	0.24	4.61	[0.11–0.29]	0.03	<0.001	Supported
H ₄ : JS → OCM	0.04	1.07	[−0.03–0.11]	0.00	0.284	Not Supported
H ₅ : WS → OCM	0.18	4.18	[0.09–0.26]	0.03	<0.001	Supported
H _{1,1} : JCM → JS → OCM	0.019	0.781	[−0.028–0.06]	—	0.435	Not Supported
H _{2,1} : JCM → WS → OCM	0.115	3.78	[0.057–0.175]	—	<0.001	Supported
H _{6a} : POF × JS → OCM	−0.01	0.10	[−0.09–0.08]	0.00	0.920	Not Supported
H _{6b} : POF × WS → OCM	0.10	2.17	[0.008–0.194]	0.01	0.029	Supported

BCaCI, bias-corrected and accelerated 95% confidence interval; WS, workplace satisfaction; JS, job satisfaction; OCM, organizational commitment; POF, person-organization fit; JCM, job characteristics model; f^2 , effect size.

benchmark, suggesting room for improvement in model fit (Henseler et al., 2015). Table 4 presents the coefficients of determination (R^2), adjusted R^2 , Q^2 predict, and prediction error metrics for the endogenous constructs. The R^2 values range from 0.388 to 0.474, indicating that between 38.8% and 47.4% of the variance in the endogenous variables is explained by the model. Specifically, JS has an R^2 of 0.388, OCM has an R^2 of 0.467, and WS has an R^2 of 0.474. The R^2 values indicate moderate explanatory power for all three constructs (Chin, 1998). The adjusted R^2 values are very close to the corresponding R^2 values, suggesting that the model is stable and not overfit. Furthermore, all the Q^2 predict values are positive and range from 0.384–0.471, indicating satisfactory out-of-sample predictive relevance for all the endogenous constructs. The prediction error metrics further support this conclusion, with root mean square error values between 0.730 and 0.787 and mean absolute error values between 0.560 and 0.616, reflecting acceptable levels of prediction accuracy.

4.3. Assessment of the structural model

As shown in Table 5, the structural model provides empirical support for the proposed higher-order formative JCM framework. JCM is positively and significantly associated with JS (H1: $\beta=0.62$, $t=24.70$, $f^2=0.63$) and WS (H2: $\beta=0.69$, $t=29.72$, $f^2=0.90$), indicating large associations. JCM also shows a positive and statistically significant association with OCM (H3: $\beta=0.24$, $t=4.61$, $f^2=0.03$), although the magnitude of this association is relatively small. Accordingly, H1, H2, and H3 are supported. Concerning the organism-response relationships, JS is not significantly associated with OCM (H4: $\beta=0.04$, $t=1.07$, 95% CI [−0.03, 0.11], $f^2=0.00$). In contrast, WS is positively and statistically significantly associated with OCM (H5: $\beta=0.18$, $t=4.18$, 95% CI [0.09, 0.26], $f^2=0.03$), although the magnitude of this association is small. Therefore, H5 is supported, whereas H4 is not supported.

The mediation analysis presented in Supplementary Figure S1 and Table 5 shows a significant indirect statistical pathway from JCM to OCM through WS (H2.1: $\beta=0.115$, $t=3.78$, 95% CI [0.057, 0.175]), whereas the indirect statistical pathway through JS is not significant (H1.1: $\beta=0.019$, $t=0.781$, 95% CI [−0.028, 0.06]). These findings support H2.1 but not H1.1. This suggests that WS, rather than JS, serves as the significant mediating mechanism linking JCM to OCM.

The moderation effect was scrutinized through a two-stage methodology (Becker et al., 2018), which entailed the formulation of interaction terms. The moderation analysis shows that POF does not significantly moderate the relationship between JS and OCM ($\beta=−0.01$, $t=0.10$, 95% CI [−0.09, 0.08], $f^2=0.00$; see Table 5 and Supplementary Figure S2). In contrast, POF significantly moderates the relationship between WS and OCM ($\beta=0.10$, $t=2.17$, 95% CI [0.008, 0.194], $f^2=0.01$; see Table 5 and Figure 2A).

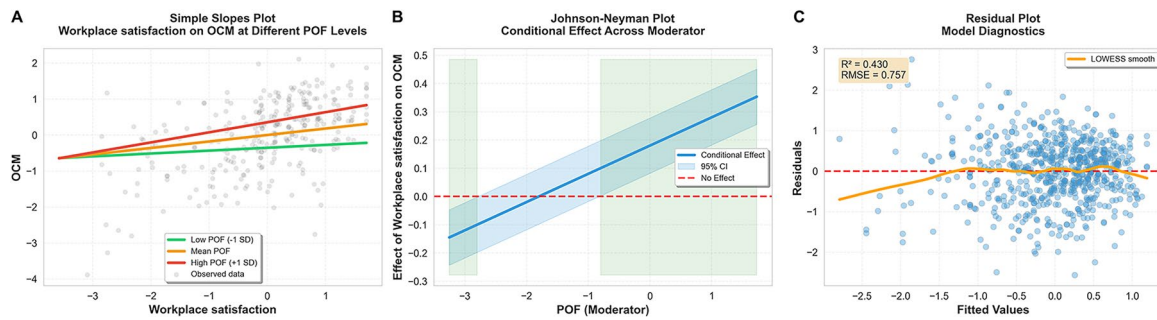


Figure 2. Interaction effects of person-organization fit on the relationship between workplace satisfaction and organizational commitment. A, simple slope analysis; B, Johnson–Neyman plot; C, residual diagnostic plot for the WS $\times$ POF moderation model. WS, workplace satisfaction; OCM, organizational commitment; POF, person-organization fit; SD, standard deviation; CI, confidence interval.

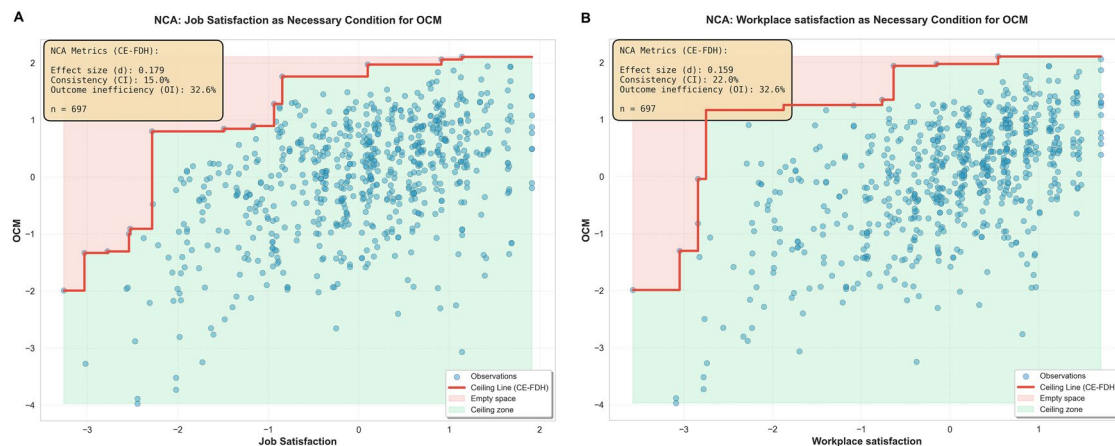


Figure 3. Necessary condition analysis plots of the relationships of job satisfaction and workplace satisfaction with organizational commitment. WS, workplace satisfaction; JS, job satisfaction; OCM, organizational commitment; CE-FDH, ceiling envelopment-free disposal hull.

The simple slopes and Johnson–Neyman plot indicate that the WS–OCM association becomes positive and statistically significant at higher levels of POF, whereas the pattern at very low levels of POF should be interpreted cautiously (Figure 2B). For the WS $\times$ POF moderation model, residuals were approximately randomly distributed around zero, and the corresponding diagnostic indices indicated acceptable prediction error ($R^2 = 0.430$, root mean square error = 0.757; Figure 2C). Thus, H6a is not supported, whereas H6b is supported.

4.4. Necessary condition analysis

Figure 3 shows the empty upper-left corner, suggesting a necessary-but-not-sufficient pattern, while Table 6 summarizes the corresponding effect sizes, condition inefficiency, and outcome inefficiency. Table 6 reports the results of the NCA for OCM. Within JCM, several dimensions emerge as statistically significant necessary conditions. Specifically, skill variety ($d=0.182$, $p<0.001$) showed the strongest necessity effect, followed by task identity ($d=0.130$, $p<0.001$), task significance ($d=0.113$, $p<0.001$), and job feedback ($d=0.079$, $p<0.001$). According to Dul’s benchmark, the first three effects were medium, whereas the effect of job feedback was small. In contrast, job autonomy ($d=0.074$) does not reach statistical significance and therefore does not constitute a necessary condition for OCM. The corresponding condition inefficiency and outcome inefficiency values indicate that these significant conditions function as threshold requirements for higher OCM, rather than as sufficient conditions by themselves. Detailed visualizations of the NCA results, including ceiling lines and bottleneck patterns for the relationships between JCM dimensions, are provided in Supplementary Figure S3.

Table 6. Necessary condition analysis results.

	Construct	Organizational commitment		
		Effect size	CI (%)	OI (%)
JCM	AU	0.074	9.258	84.534
	FB	0.079*	19.082	84.534
	SV	0.182*	9.160	21.734
	TI	0.130*	34.827	30.421
	TS	0.113*	28.635	58.819
JS	—	0.179*	14.965	32.609
WS	—	0.159*	21.993	32.609

Note: * $p < 0.001$. The accuracy of the CE-FDH line is not reported because it is always 100% by design. Dul's benchmarks are $d < 0.10$ (small); 0.10–0.30 (medium); and > 0.30 (large). WS, workplace satisfaction; JS, job satisfaction; OCM, organizational commitment; POF, person-organization fit; JCM, job characteristics model; SV, skill variety; TI, task identity; TS, task significance; AU, job autonomy; FB, job feedback; CI, condition inefficiency; OI, outcome inefficiency.

In addition to the JCM dimensions, both JS and WS had statistically significant necessity effects on OCM, with moderate effect sizes ($d=0.179$ and $d=0.159$, respectively). Their condition inefficiency and outcome inefficiency values suggest that minimum levels of satisfaction are required for higher OCM, whereas further increases beyond the threshold may yield limited additional necessity. Figure 3 shows that both JS (Figure 3A) and WS (Figure 3B) function as necessary but not sufficient conditions for OCM, as evidenced by the empty upper-left corner and the CE-FDH ceiling lines. JS showed a slightly larger necessity effect than WS, suggesting that both satisfaction states represent relevant threshold conditions for high OCM. In the bivariate NCA plots, JS and WS showed positive unadjusted trends with OCM. However, in the adjusted PLS-SEM model, only WS retained a statistically significant association with OCM, whereas JS did not. The dispersion of observations below the ceiling lines indicates a necessary-but-not-sufficient pattern, suggesting that high levels of JS or WS alone do not guarantee elevated OCM.

The bottleneck analysis in Supplementary Table S9 indicates that no JCM dimensions, JS, or WS constrain OCM at low outcome levels (0–20%). Bottlenecks begin to emerge from lower-to-moderate OCM levels, with skill variety appearing as early as 30%, followed by task identity, JS, and WS at higher outcome levels. This indicates that minimum thresholds of these conditions must be met to achieve greater commitment. At high outcome levels ($\geq 80\%$), JS becomes one of the most pronounced bottlenecks, whereas other job characteristics also exhibit sharply increasing threshold requirements, suggesting that attaining very high OCM requires simultaneously elevated levels of multiple antecedent conditions.

Importantly, the NCA results augment the PLS-SEM findings by revealing structural bottlenecks that must be satisfied prior to the emergence of positive employee outcomes. While PLS-SEM elucidates robust net effects of JCM on JS ($\beta=0.62$), WS ($\beta=0.69$), and OCM ($\beta=0.24$), NCA clarifies which JCM dimensions, JS, and WS are essential prerequisites rather than merely influential predictors. Collectively, the integrated PLS-SEM and NCA approach suggests that JCM is associated with OCM through average net effects while also identifying minimum enabling conditions that may be required for high OCM.

5. Discussion

5.1. Discussion of the results

The findings provide evidence that JCM is positively associated with JS, WS, and OCM among Vietnamese educators. Specifically, JCM is substantially associated with JS and WS, and more modestly associated with OCM. These results are consistent with the core propositions of the JCM (Hackman & Oldham, 1976) and align with prior meta-analytic evidence (Fried & Ferris, 1987; Humphrey et al., 2007; Mathieu & Zajac, 1990; Meyer & Allen, 1991). Notably, the association between JCM and WS is stronger than the association between JCM and JS, suggesting that job design is linked not only to task-related experiences but also to employees' broader evaluations of their working environment (Lee & Brand, 2005; Weiss & Cropanzano, 1996). In the context of Vietnam's education sector, where teaching and research involve high cognitive demands and strong social significance, increasing educators' autonomy in instructional decisions and providing clear, constructive feedback are likely to enhance professional fulfillment and WS. Furthermore, the significant direct association between JCM and OCM suggests that well-designed

academic jobs may be linked to stronger psychological attachment to institutions and may support sustained engagement and retention.

In addition to direct effects, the results reveal an important asymmetry in the organism-response relationships. The findings indicate that WS is positively and statistically significantly associated with OCM (H5), whereas JS is not significantly associated with OCM (H4). This asymmetric pattern offers important theoretical and contextual insights, particularly within Vietnam's education sector. From a theoretical standpoint, this asymmetry is consistent with the compatibility principle, whereby an attitude predicts an outcome most strongly when both share the same target, and with the target similarity model, in which organization-directed outcomes are driven primarily by organization-directed evaluations (Lavelle et al., 2007). Because OCM is organization-directed, it aligns more closely with WS than with the job-referenced state of JS, especially among educators whose job satisfaction is rooted in a professional identity that transcends any single institution (Mowday, 1998; Tett & Meyer, 1993), so positive job-focused experiences need not convert into attachment to a specific employer.

In contrast, the significant association involving WS underscores the central role of contextual and environmental factors in fostering OCM. WS captures employees' holistic evaluations of their working environment, including leadership support, collegial relationships, the organizational climate, and opportunities for professional development. Consistent with perceived organizational support (Eisenberger et al., 1986; Locke, 1976; Meyer & Allen, 1991), a supportive and well-structured workplace may be linked to employees' sense of belonging and psychological obligation toward the organization. This finding is particularly salient in Vietnam's education sector, where academic work is characterized by high autonomy and strong professional norms that often transcend institutional boundaries. While educators may remain committed to their profession regardless of their organizational affiliation, a positive workplace environment marked by transparent governance, collegial support, and recognition plays a critical role in cultivating sustained OCM. Overall, the results suggest that strengthening commitment in education may require prioritizing workplace conditions alongside job design, thereby advancing a more nuanced understanding of commitment formation in knowledge-intensive organizations.

The mediation analysis suggests a theoretically meaningful indirect pathway in which WS, but not JS, statistically links JCM with OCM. This pattern indicates that well-designed jobs may strengthen OCM primarily when they are associated with more favorable evaluations of the institutional context. The relevance of this pathway has become particularly salient in the post-COVID-19 era, marked by the emergence of the 'Great Resignation'. This phenomenon reflects a widespread tendency for employees to leave organizations not only because of dissatisfaction with job tasks but also because of negative holistic evaluations of the work environment, organizational culture, leadership support, and a diminished sense of belonging (Hom & Kiazad, 2025; Kniffin et al., 2021; Serenko, 2023). Consistent with meta-analytic evidence on work design and organizational support theory (Fried & Ferris, 1987; Humphrey et al., 2007; Meyer & Allen, 1991), well-designed jobs may be associated with more positive perceptions of the workplace environment, which in turn are linked to stronger OCM. In Vietnam's increasingly competitive education labor market, educational institutions therefore cannot rely solely on the intrinsic meaning of teaching and academic work. They need to cultivate supportive, fair, and development-oriented workplace environments to sustain OCM.

The moderation analysis indicates that POF conditions the association between WS and OCM, but not between JS and OCM. This finding suggests that WS is more strongly linked to OCM when educators perceive a high level of value alignment with their institutions. In contrast, satisfaction with professional tasks alone may be insufficient to generate sustained institutional attachment, even when perceived fit is high. This interpretation is consistent with prior work showing that value congruence strengthens employees' psychological attachment to the organization (Kristof, 1996; O'Reilly et al., 1991; Tett & Meyer, 1993). This mechanism is particularly relevant in Vietnam's education sector, where educators may remain attached to their profession while being mobile across institutions. Accordingly, schools and universities may benefit from developing supportive, fair, and value-congruent work environments as part of efforts to sustain long-term OCM.

Importantly, NCA offers complementary theoretical insights into the formation of OCM that extend beyond conventional average-effect approaches. The findings indicate that skill variety, task identity, and task significance function as medium-level necessary conditions for high OCM, whereas feedback shows a

smaller but statistically significant necessity effect. However, these conditions are necessary but not sufficient. Their presence alone does not guarantee high commitment (Dul, 2016). In other words, without minimum levels of these conditions, strong commitment is less likely to emerge. Moreover, both JS and WS exhibit necessity effects, as revealed by bottleneck analysis. The necessity and net-effect findings for JS are complementary rather than contradictory. In the bivariate NCA, JS operates as a necessary condition, meaning that a minimum level of JS must be present for high OCM to occur, whereas in the adjusted PLS-SEM model JS adds no marginal variance once WS is accounted for, partly because the two states share substantial variance (Heterotrait-Monotrait ratio = 0.715). JS therefore appears to act as a threshold prerequisite rather than an incremental driver of OCM, an interpretation that only the combined PLS-SEM and NCA design can reveal. While no constraints are observed at low commitment levels (0–20%), pronounced bottlenecks arise at moderate and high levels. As OCM approaches very high thresholds (80–100%), the minimum required levels of satisfaction and core job characteristics, particularly skill variety and task identity, increase sharply. These findings demonstrate that OCM is not driven by isolated factors but emerges from the joint configuration of multiple enabling conditions. By distinguishing between indispensable prerequisites and predictors with average net effects, this study extends classical JCM theory (Hackman & Oldham, 1976) and prior meta-analytic evidence (Fried & Ferris, 1987; Humphrey et al., 2007). In the context of Vietnamese education, which is characterized by high professional autonomy and increasing academic mobility, the results underscore the importance of securing minimum thresholds of meaningful job design and supportive work environments to avoid structural bottlenecks in sustaining OCM.

5.2. Theoretical implications

This study advances the theoretical understanding of the JCM and OCM in three important ways. First, by integrating the S-O-R framework with JCM, the study illustrates how job design conditions, conceptualized as stimuli, are associated with JS and WS, which are in turn linked to OCM. In doing so, the study refines JCM by clearly distinguishing between job-focused attitudinal pathways and organization-focused contextual pathways, demonstrating that WS, rather than JS, appears to serve as the primary psychological pathway statistically linking job design to OCM. Second, by combining NCA with PLS-SEM, the study extends commitment research beyond average net effects and identifies critical threshold conditions, showing that core job characteristics and satisfaction function as necessary but not sufficient conditions for high OCM. Third, the findings suggest that POF may serve as a boundary condition under which positive workplace experiences are more strongly associated with organizational attachment. Taken together, these contributions deepen the theoretical insights into commitment formation in knowledge-intensive and highly professionalized organizations.

5.3. Managerial implications

Vietnam's education environment is changing rapidly under pressures of autonomy and competition. Workplace experiences are therefore increasingly critical for maintaining educators' OCM. The findings indicate that school and institutional administrators may consider prioritizing the organizational environment rather than relying solely on the intrinsic meaning of academic work. Although educators may derive substantial satisfaction from teaching, educational support, and research activities, sustained OCM appears to be more closely associated with workplace conditions, including transparent governance, collegial relationships, fair evaluation systems, and opportunities for professional development. Given the high professional mobility and strong disciplinary identities of teaching staff, universities may benefit from emphasizing value alignment and cultivating supportive institutional climates as part of broader faculty retention strategies. Accordingly, managing WS as a strategic organizational resource may be important for sustaining OCM in Vietnam's increasingly competitive education sector.

5.4. Limitations and future research directions

This study has several limitations that suggest directions for future research. First, the cross-sectional design does not allow definitive conclusions about temporal ordering or causal relationships, although

the hypothesized pathways were theoretically grounded in the S-O-R framework. Therefore, the findings should be interpreted as associations rather than causal evidence. In this study, PLS-SEM was used to estimate average net associations, whereas NCA was used to identify necessary but not sufficient conditions for high OCM. Together, these analyses provide complementary evidence on net-effect pathways and threshold-based requirements, but they cannot establish longitudinal changes in job characteristics, satisfaction, or OCM. Future studies could employ longitudinal or panel designs to better capture how these constructs evolve over time. Second, the study relies on single-source, self-reported data. Although statistical procedures were applied to reduce potential bias, common-method variance and social desirability bias cannot be fully ruled out. Future research could strengthen validity by incorporating multi-source data, such as supervisor assessments, peer evaluations, or institutional records. Third, the sample is limited to educators in educational institutions in Da Nang, Vietnam. Because educators often possess a distinctive professional identity and work within highly specific institutional settings, the relationships observed in this study may not be directly generalizable to less specialized sectors or other national contexts. Future studies are therefore encouraged to replicate and compare the model across industries, occupational groups, and cultural settings. Because job design profiles differ across levels, for example autonomy and skill variety tend to be higher in higher education, the magnitude, though likely not the direction, of these relationships may vary across segments. As the sample combined educators from preschool to university and the smallest settings precluded fully disaggregated comparison, future research should test the model within more homogeneous segments and across institutional types. Finally, while NCA helps identify necessary thresholds for higher OCM, future research may complement this approach with other methods, such as fuzzy-set qualitative comparative analysis, to explore alternative causal configurations. Additional studies may also extend the model by examining other psychological mechanisms, such as psychological safety, meaningful work, and resilience.

6. Conclusions

This study investigates how the JCM, conceptualized as a higher-order formative construct, is associated with OCM in Vietnam's post-pandemic education context. Drawing on the S-O-R framework, the findings suggest that job design conditions are associated with OCM both directly and indirectly through distinct psychological states, JS and WS. Importantly, the results reveal that WS, rather than JS, appears to constitute the primary psychological pathway through which job characteristics are statistically linked to sustained OCM. The moderation analysis further indicates that POF appears to condition the association between WS and OCM, underscoring the role of value congruence in linking positive workplace experiences with durable organizational attachment. By integrating NCA with PLS-SEM, this study moves beyond average net effects to identify critical threshold conditions. Core job characteristics, particularly skill variety, task identity, task significance, and feedback, emerge as necessary but not sufficient conditions for high commitment, whereas satisfaction operates as an enabling prerequisite rather than a guarantee. Collectively, these findings advance a more nuanced, context-sensitive understanding of commitment formation in knowledge-intensive and highly professionalized organizations and suggest the importance of meeting minimum job design and workplace conditions to avoid structural bottlenecks in sustaining OCM within Vietnam's evolving education sector.

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Authors contribution

CRedit: **Dang Thien Tam**: Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft, Writing – review & editing; **Truong Thi Phuong Kieu**: Investigation, Writing – original draft, Writing – review & editing; **Le Tan Anh Huy**: Investigation, Writing – original draft, Writing – review & editing; **Nguyen Thuy Anh**: Investigation, Writing – original draft, Writing – review & editing; **Nguyen Thi Hoai Oanh**: Investigation, Writing

– original draft, Writing – review & editing; **Dang Thanh Dung**: Investigation, Writing – original draft, Writing – review & editing; **Nguyen Thi Thu Hang**: Investigation, Writing – original draft, Writing – review & editing; **Nguyen Thi Thao**: Investigation, Writing – original draft, Writing – review & editing; **Hai Nguyen Ngoc Dang**: Conceptualization, Formal analysis, Investigation, Methodology, Supervision, Validation, Writing – original draft, Writing – review & editing.

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About the authors

Dang Thien Tam is a lecturer at the Faculty of Marketing, Duy Tan University, Da Nang, Vietnam. His research focuses on the social sciences, with a specific emphasis on organizational behavior. His work applies quantitative frameworks and structural equation modeling to examine how individual attitudes, interpersonal dynamics, and workplace factors shape behavioral outcomes in organizational settings.

Truong Thi Phuong Kieu is a student at Duy Tan University, Da Nang, Vietnam. Her research fields include organizational behavior and human resource management, with a specific emphasis on how job design and workplace conditions shape employee attitudes. Her work draws on quantitative methods to examine the psychological mechanisms linking work environment to affective and behavioral outcomes.

Le Tan Anh Huy is a student at Duy Tan University, Da Nang, Vietnam. His research fields include marketing management, consumer psychology, and green marketing. His work investigates the antecedents of environmentally responsible behavior and the role of marketing strategy in fostering sustainable consumption patterns.

Nguyen Thuy Anh is a student at Duy Tan University, Da Nang, Vietnam. Her research focuses on organizational behavior, particularly the role of job characteristics in shaping employee well-being and work attitudes. Her work applies structural equation modeling to explore stimulus-organism-response mechanisms in service and educational settings.

Nguyen Thi Hoai Oanh is a student at Duy Tan University, Da Nang, Vietnam. Her research interests center on organizational commitment and quality of work life, with particular attention to how psychological and structural job resources influence employee retention. Her work integrates quantitative survey-based methods to model these relationships in Vietnamese organizational contexts.

Dang Thanh Dung is a doctoral candidate and Dean of the Faculty of Marketing, Duy Tan University, Da Nang, Vietnam. His scientific discipline is rooted in marketing and consumer behavior, with a specific focus on attitude-behavior relationships. His research examines how perceived behavioral control and subjective norms influence purchase intention in the context of sustainable products.

Nguyen Thi Thu Hang is a lecturer at Duy Tan University, Da Nang, Vietnam. Her research fields include job satisfaction and organizational citizenship behavior, with a focus on the antecedents of discretionary employee behavior in the workplace. Her work applies quantitative frameworks to examine how core job characteristics translate into positive organizational outcomes.

Nguyen Thi Thao is a lecturer at Duy Tan University, Da Nang, Vietnam. Her research focuses on organizational behavior and quantitative research methods, with a specific emphasis on necessary condition analysis and higher-order composite modeling. Her work examines the boundary conditions under which job design factors are essential for positive employee outcomes.

Hai Nguyen Ngoc Dang has an interdisciplinary academic and professional background spanning linguistics, economics, and cardiology. He holds academic qualifications in linguistics and economics, as well as medical and specialist training in cardiology. He was formerly affiliated with Duy Tan University, Da Nang, Vietnam, and is currently working and conducting research at the University of Tasmania, Australia. His research interests span multiple disciplines and reflect both interdisciplinary and multidisciplinary approaches, including medicine, economics, education, and data science.

ORCID

Dang Thien Tam  <http://orcid.org/0009-0007-7094-0988>

Hai Nguyen Ngoc Dang  <http://orcid.org/0009-0006-4512-4658>

Data availability statement

The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

References

- Becker, J.-M., Ringle, C. M., & Sarstedt, M. (2018). Estimating moderating effects in PLS-SEM and PLSc-SEM: interaction term generation*data treatment. *Journal of Applied Structural Equation Modeling*, 2(2), 1–21. [https://doi.org/10.47263/JASEM.2\(2\)01](https://doi.org/10.47263/JASEM.2(2)01)
- Bogler, R. (2001). The influence of leadership style on teacher job satisfaction. *Educational Administration Quarterly*, 37(5), 662–683. <https://doi.org/10.1177/00131610121969460>
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1(3), 185–216. <https://doi.org/10.1177/135910457000100301>
- Cable, D. M., & DeRue, D. S. (2002). The convergent and discriminant validity of subjective fit perceptions. *The Journal of Applied Psychology*, 87(5), 875–884. <https://doi.org/10.1037/0021-9010.87.5.875>
- Chin, W. W. (1998). The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Ed.), *Modern methods for business research* (pp. 295–336). Lawrence Erlbaum Associates Publishers.
- Crede, M., Chernyshenko, O. S., Stark, S., Dalal, R. S., & Bashshur, M. (2007). Job satisfaction as mediator: An assessment of job satisfaction's position within the nomological network. *Journal of Occupational and Organizational Psychology*, 80(3), 515–538. <https://doi.org/10.1348/096317906X136180>
- Dul, J. (2016). Necessary condition analysis (NCA): Logic and methodology of “Necessary but not sufficient” causality. *Organizational Research Methods*, 19(1), 10–52. <https://doi.org/10.1177/1094428115584005>
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(3), 500–507. <https://doi.org/10.1037/0021-9010.71.3.500>
- Eryilmaz, N., Kennedy, A. I., Strietholt, R., & Johansson, S. (2025). Teacher job satisfaction: International evidence on the role of school working conditions and teacher characteristics. *Studies in Educational Evaluation*, 86, 101474. <https://doi.org/10.1016/j.stueduc.2025.101474>
- Fink, A. (2013). *How to conduct surveys: A step-by-step guide* (5th ed.). SAGE Publications. http://archive.org/details/howtoconductsurv0000fink_5ed
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.2307/3151312>
- Fried, Y., & Ferris, G. R. (1987). The validity of the Job Characteristics Model: A review and meta-analysis. *Personnel Psychology*, 40(2), 287–322. <https://doi.org/10.1111/j.1744-6570.1987.tb00605.x>
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, 16(2), 250–279. [https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7)
- Hagen, T., Bogaerts, S., & De Caluwé, E. (2025). Mediation effects of job satisfaction in the relationships between job characteristics and the outcomes burnout and work engagement among Dutch judges. *Acta Psychologica*, 259, 105401. <https://doi.org/10.1016/j.actpsy.2025.105401>
- Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) using R: A workbook*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-80519-7>
- Hassan, M., Akram, A., & Naz, S. (2012). The relationship between person organization fit, person-job-fit and turnover intention in banking sector of Pakistan: The mediating role of psychological climate. *International Journal of Human Resource Studies*, 2(3), 172. <https://doi.org/10.5296/ijhrs.v2i3.2286>
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Herscovitch, L., & Meyer, J. P. (2002). Commitment to organizational change: Extension of a three-component model. *The Journal of Applied Psychology*, 87(3), 474–487. <https://doi.org/10.1037/0021-9010.87.3.474>
- Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in Nursing & Health*, 31(2), 180–191. <https://doi.org/10.1002/nur.20247>
- Herzberg, F., Mausner, B., & Snyderman, B. (1959). *The motivation to work* (2nd ed.). John Wiley.
- Hoenig, J. M., & Heisey, D. M. (2001). The abuse of power: The pervasive fallacy of power calculations for data analysis. *The American Statistician*, 55(1), 19–24. <https://doi.org/10.1198/000313001300339897>
- Hom, P. W., & Kiazad, K. (2025). New directions for theories for why employees stay or leave. *Annual Review of Organizational Psychology and Organizational Behavior*, 12(1), 185–213. <https://doi.org/10.1146/annurev-orgpsych-110622-033733>
- Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal*, 20(2), 195–204. [https://doi.org/10.1002/\(SICI\)1097-0266\(199902\)20:2<195::AID-SMJ13>3.0.CO;2-7](https://doi.org/10.1002/(SICI)1097-0266(199902)20:2<195::AID-SMJ13>3.0.CO;2-7)

- Humphrey, S. E., Nahrgang, J. D., & Morgeson, F. P. (2007). Integrating motivational, social, and contextual work design features: A meta-analytic summary and theoretical extension of the work design literature. *The Journal of Applied Psychology*, 92(5), 1332–1356. <https://doi.org/10.1037/0021-9010.92.5.1332>
- Jager, J., Putnick, D. L., & Bornstein, M. H. (2017). More than just convenient: The scientific merits of homogeneous convenience samples. *Monographs of the Society for Research in Child Development*, 82(2), 13–30. <https://doi.org/10.1111/mono.12296>
- Jaros, S. J. (1997). An assessment of Meyer and Allen's (1991) three-component model of organizational commitment and turnover intentions. *Journal of Vocational Behavior*, 51(3), 319–337. <https://doi.org/10.1006/jvbe.1995.1553>
- Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). Guilford Press.
- Kniffin, K. M., Narayanan, J., Anseel, F., Antonakis, J., Ashford, S. P., Bakker, A. B., Bamberger, P., Bapuji, H., Bhawe, D. P., Choi, V. K., Creary, S. J., Demerouti, E., Flynn, F. J., Gelfand, M. J., Greer, L. L., Johns, G., Keesebir, S., Klein, P. G., Lee, S. Y., ... Vugt, M. V. (2021). COVID-19 and the workplace: Implications, issues, and insights for future research and action. *The American Psychologist*, 76(1), 63–77. <https://doi.org/10.1037/amp0000716>
- Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology*, 49(1), 1–49. <https://doi.org/10.1111/j.1744-6570.1996.tb01790.x>
- Lavelle, J. J., Rupp, D. E., & Brockner, J. (2007). Taking a multifoci approach to the study of justice, social exchange, and citizenship behavior: The target similarity model. *Journal of Management*, 33(6), 841–866. <https://doi.org/10.1177/0149206307307635>
- Lee, S. Y., & Brand, J. L. (2005). Effects of control over office workspace on perceptions of the work environment and work outcomes. *Journal of Environmental Psychology*, 25(3), 323–333. <https://doi.org/10.1016/j.jenvp.2005.08.001>
- Locke, E. A. (1976). The nature and causes of job satisfaction. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 1297–1349). Rand McNally.
- Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57(3), 519–530. <https://doi.org/10.1093/biomet/57.3.519>
- Mathieu, J. E., & Zajac, D. M. (1990). A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment. *Psychological Bulletin*, 108(2), 171–194. <https://doi.org/10.1037/0033-2909.108.2.171>
- Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. The MIT Press.
- Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, 1(1), 61–89. [https://doi.org/10.1016/1053-4822\(91\)90011-Z](https://doi.org/10.1016/1053-4822(91)90011-Z)
- Meyer, J. P., Stanley, D. J., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. *Journal of Vocational Behavior*, 61(1), 20–52. <https://doi.org/10.1006/jvbe.2001.1842>
- Ministry of Education and Training of Viet Nam. (2024). *Ten key tasks of the Ministry of Education and Training in 2024*. Ministry of Education and Training of Viet Nam. <https://vqa.moet.gov.vn/vi/news/tin-tuc-su-kien/10-nhom-nhiem-vu-trong-tam-cua-bo-giao-duc-va-dao-tao-nam-2024-80.html>
- Mowday, R. T. (1998). Reflections on the study and relevance of organizational commitment. *Human Resource Management Review*, 8(4), 387–401. [https://doi.org/10.1016/S1053-4822\(99\)00006-6](https://doi.org/10.1016/S1053-4822(99)00006-6)
- National Assembly of the Socialist Republic of Viet Nam. (2018). *Law No. 34/2018/QH14 on amendments and supplements to a number of articles of the Law on Higher Education* (Issue Nos1135-1136, pp. 65–99). Official Gazette of the Socialist Republic of Viet Nam. <https://vanban.chinhphu.vn/?pageid=27160&docid=206102>
- O'Reilly, C., Chatman, J., & Caldwell, D. (1991). People and organizational culture: A profile comparison approach to assessing person-organization fit. *Academy of Management Journal*, 34(3), 487–516. <https://doi.org/10.5465/256404>
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health*, 42(5), 533–544. <https://doi.org/10.1007/s10488-013-0528-y>
- Politburo of the Communist Party of Viet Nam. (2025). *Resolution No. 71-NQ/TW dated August 22, 2025 of the Politburo on breakthroughs in education and training development*. Central Committee of the Communist Party of Viet Nam.
- Prime Minister of Viet Nam. (2025). *Official Dispatch No. 61/CD-TTg dated May 10, 2025 on organizing the high school graduation examination, ensuring staffing quotas for preschool and general-education teachers, and summer arrangements for children and students in 2025*. Government Portal of Viet Nam. <https://vanban.chinhphu.vn/?docid=213589&pageid=27160>
- Richter, N. F., & Hauff, S. (2022). Necessary conditions in international business research—Advancing the field with a new perspective on causality and data analysis. *Journal of World Business*, 57(5), 101310. <https://doi.org/10.1016/j.jwb.2022.101310>
- Sarstedt, M., Hair, J. F., Cheah, J.-H., Becker, J.-M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. *Australasian Marketing Journal*, 27(3), 197–211. <https://doi.org/10.1016/j.ausmj.2019.05.003>
- Schmiedehaus, E., Cordaro, M., Perrotte, J., Stern, M., Dailey, S., & Howard, K. (2023). The great resignation in higher education: An occupational health approach to understanding intentions-to-quit for faculty in higher education. *Teaching and Teacher Education*, 123, 103992. <https://doi.org/10.1016/j.tate.2022.103992>
- Serenko, A. (2023). The Great Resignation: The great knowledge exodus or the onset of the Great Knowledge Revolution? *Journal of Knowledge Management*, 27(4), 1042–1055. <https://doi.org/10.1108/JKM-12-2021-0920>

- Tett, R. P., & Meyer, J. P. (1993). Job satisfaction, organizational commitment, turnover intention, and turnover: Path analyses based on meta-analytic findings. *Personnel Psychology*, 46(2), 259–293. <https://doi.org/10.1111/j.1744-6570.1993.tb00874.x>
- Troiville, J., Moisescu, O. I., & Radomir, L. (2025). Using necessary condition analysis to complement multigroup analysis in partial least squares structural equation modeling. *Journal of Retailing and Consumer Services*, 82, 104018. <https://doi.org/10.1016/j.jretconser.2024.104018>
- Veldman, I., van Tartwijk, J., Brekelmans, M., & Wubbels, T. (2013). Job satisfaction and teacher–student relationships across the teaching career: Four case studies. *Teaching and Teacher Education*, 32, 55–65. <https://doi.org/10.1016/j.tate.2013.01.005>
- Watermeyer, R., Bolden, R., Knight, C., & Crick, T. (2025). Academic anomie: Implications of the ‘great resignation’ for leadership in post-COVID higher education. *Higher Education*, 89(5), 1215–1233. <https://doi.org/10.1007/s10734-024-01268-0>
- Weiss, H. M., & Cropanzano, R. (1996). Affective events theory: A theoretical discussion of the structure, causes and consequences of affective experiences at work. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 18, pp. 1–74). Elsevier Science/JAI Press.