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Emotional Intelligence and Metacognitive Awareness as Predictors of Innovative Work Behavior: The Mediating Roles of Psychological Capital, Work Engagement, and Psychological Well-Being and the Moderating Role of Perceived Organizational Support

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ABSTRACT

Faculty innovation is essential for enhancing teaching, research, and institutional performance in higher education. However, limited research has explained how emotional intelligence and metacognitive awareness jointly foster innovative work behavior through underlying psychological mechanisms, particularly in developing-country contexts. Drawing on the Job Demands–Resources (JD-R) theory, this study examines the roles of psychological capital, work engagement, psychological well-being, and perceived organizational support in explaining faculty innovation. Data were collected from 270 faculty members employed in public universities across Pakistan and analyzed using partial least squares structural equation modeling (PLS-SEM). The findings indicate that emotional intelligence and metacognitive awareness positively influence psychological capital and work engagement, which subsequently enhance psychological well-being. Psychological well-being emerged as the strongest predictor of innovative work behavior, while perceived organizational support strengthened this relationship. The study extends JD-R theory by integrating emotional and cognitive personal resources within a unified motivational framework and demonstrates how individual and organizational resources jointly promote faculty innovation. The findings also provide practical guidance for universities seeking to enhance faculty well-being, engagement, and innovative performance through supportive organizational practices.



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Introduction

Universities of Pakistan are facing the pressure to deliver more results despite limited resources. The higher education sector in Pakistan has expanded rapidly in the past 20 years due to the increase in number of campuses, educational programs and faculty positions but the conditions of faculty members remain at 0.8% of the national education budget. Much of the funding that the universities receive is being spent on the running costs instead of research and development. At the same time, the basis for educators to consider what can count as a valid scientific publication is also changing. The Higher Education Commission revised its Journals and Publications Policy in 2024, tightening what faculty need for appointments, promotions, and supervising PhD students. In short, faculty are being asked to publish more and publish better, without being given more time, money, or support to do it.

This is the setting in which innovative work behavior has become a topic researchers pay close attention to. It means something fairly simple: coming up with new ideas at work, pushing for them, and actually putting them into practice — whether that's a new way of teaching a course, a new research direction, or just a better way of handling a problem a department has lived with for years (Janssen, 2000; De Jong & Den Hartog, 2010). Interest in this goes well beyond Pakistan. Researchers in China have linked teacher innovation to the job insecurity that comes with tenure-track systems (Yang, Cai, & Cai, 2024), and a 2025 study found that engagement and organizational support together predict how innovative university teachers are (Zargar, Daouk, & Chahine, 2025). The pattern across this research is consistent, innovation among academic staff isn't mainly about talent. It depends on whether the psychological and organizational conditions around a person make innovating feel worth the effort.

Research in Pakistan has begun to take this into account. da Costa et al., (2021) noted that emotional intelligence, psychological capital, and social capital was found to be collectively

predictive of innovation among university workers, with no explanation offered as to how emotional intelligence creates psychological capital. Sultana et al. (2024) showed that psychological capital predicted innovation via increased engagement from employees, while Wahid and Ayub (2024) informed that psychological capital along with organizational support contributed to innovation among faculty across the entire country. Lastly, Anwar et al. (2025) showed that emotional intelligence reduced faculty cynicism towards their institutions, indicating that emotional capability affects the faculty's attitudes toward their workplaces even before innovation matters.

In spite of the fact that increased interest has been shown in the innovative work behavior of university faculty, there still exist some gaps in the existing literature. The first gap is that emotional intelligence and metacognition have mainly been studied separately, which means that not enough interest has been paid to a more complex understanding of what they do together to help in innovation. In order to solve the research problem, the previous studies focused only on individuals as mediators and neglected the fact that there are many motivational resources that need to be studied together within one framework. Moreover, while psychological well-being is said to be the outcome of the working conditions, in fact, it should be viewed as the mechanism of turning personal and motivational resources into innovative work behavior. Furthermore, although it is clear that perceived organizational support is important for the success of the organization, its role to create the link between psychological well-being and innovative work behavior needs to be studied. Finally, the evidence of using these connections in the context of higher education in Pakistan is nearly non-existent.

Filling these voids, this research creates and proceeds with the implementation of the integrated Job Demands–Resources (JD-R) model employing emotional intelligence and metacognitive awareness as supporting personal resources which favorably affect psychological capital and work engagement thus promote

psychological well-being as well as innovative work behavior. In addition, the research considers perceived organizational support as a limiting factor enhancing the influence of psychological well-being on innovation. The empirical base of the research is composed of the results of the survey held among educational staff of the public universities of Punjab, Sindh, and Islamabad capital area which makes it possible to present a complex explanation of how personal and organizational resources boost innovation in higher education.

This research provides new contributions to existing knowledge. To start with, this research is an extension of Job Demands-Resources theory where emotional intelligence and metacognitive awareness are added as supplementary personal resources within a single motivational model. The second contribution is explaining faculty innovation by using various psychological processes with the use of psychological capital, work engagement, and psychological well-being in a single model. The third contribution is an explanation of perceived organizational support as a moderator that makes psychological well-being more strongly related to innovative job behavior. Finally, due to the fact that this research examined public universities in Pakistan, which is a country that is understudied in terms of organizational behavior research, some empirical evidence from the higher education environment is provided.

Research Aims and Questions

This study aims to examine how personal resources, motivational states, well-being, and organizational support jointly shape innovative work behavior among Pakistani university faculty. It addresses the following questions:

1. Do emotional intelligence and metacognitive awareness predict psychological capital and work engagement among faculty at public-sector universities in Punjab, Sindh, and the Islamabad Capital Territory?
2. Does psychological well-being mediate the relationship between these motivational channels and innovative work behavior?
3. Does perceived organizational support strengthen the relationship between faculty well-being and innovative work behavior?

Literature Review

Job Demands-Resources Theory and the Motivational Process in Academic Work

The Job Demands-Resources (JD-R) model has become one of the most widely applied frameworks for understanding how work conditions shape employee functioning, precisely because it does not require researchers to choose between explaining strain and explaining motivation. It holds that job demands and resources set off two separate processes: a health-impairment process, in which demands wear employees down, and a motivational process, in which resources build them up (Demerouti et al. 2001; Bakker and Demerouti 2007). A decade-later stocktaking of the theory reaffirmed this dual structure while adding a sharper focus on how personal characteristics interact with the work situation, and on how resources and engagement can build on each other over time in what the authors call a gain spiral (Bakker, Demerouti, and Sanz-Vergel 2023). That gain spiral is the part of the theory this study leans on most heavily: a faculty member who starts with strong emotional and cognitive resources is, in principle, better placed to accumulate further resources and engagement as their career continues, rather than simply holding steady.

Academic work fits this framework unusually well. Teaching, research, and administration each carry their own demands, but universities also supply resources of very different kinds — some personal, carried by the individual faculty member, and some organizational, supplied or withheld by the institution. In their work, Adil and Kamal (2019) explored the effectiveness of this combination for Pakistani university teachers - with results indicating that authentic leadership and psychological capital acted together according to JD-R model-based frameworks. The implication here being that the idea of JD-R theory, while originally taken from Western business practices, is relevant to Pakistani universities also. In this

paper, however, motivation will be studied independently, starting on its investigation from the very beginning of the concept up to its application for a specific context, i.e. innovation.

Emotional Intelligence as a Personal Resource in Academic Work

Emotional intelligence (EI) is defined as an individual's ability to identify, comprehend, regulate, and use their emotions efficiently. It is viewed as a valuable individual resource in the Job Demands–Resources (JD-R) model. Individual resources facilitate working within the demands of the job, motivation within employees, and coping with difficult situations. Emotional intelligence is especially applicable in academia, where faculty have to neglect teaching, research, and administrative duties. EI assists individuals in controlling their emotions more efficiently and helps them to cope with stress and keep their relationships positive.

Numerous studies findings support the positive influence of emotional intelligence on organization settings. Regarding the case of Pakistani higher education, emotional intelligence positively influences the negative impact of organizational cynicism on faculty members' work attitudes (Anwar et al., 2025). Additionally, EI contributes to innovative work behavior indicating its positive effects along with psychic and social resources da (Costa et al., 2021). International evidence reaches similar conclusions, with systematic reviews indicating that emotional intelligence is closely associated with desirable psychological outcomes, particularly psychological capital, across diverse organizational contexts (Kaisara, 2025).

Even though these findings remain consistent over time, literature review shows there are two main drawbacks in existing literature. Firstly, emotional intelligence is mostly treated only as an individual antecedent to organizational outcomes, rather than as a part of broader motivational process. Secondly, although the existence of positive relationship between emotional intelligence and psychological capital is confirmed in many previous studies, earlier investigations rarely address the ways in which emotional intelligence transforms into psychological resources affecting

employee behavior. Therefore, the processes behind the ways in which emotional intelligence affects innovative work behavior are still unclear.

Based on the JD-R model, present paper approaches emotional intelligence as one of the personal resources initiating motivational process and affecting both psychological capital and work engagement. In the case of faculty members possessing good emotional intelligence, better understanding of their emotions leads to development of features, such as confidence, optimism, resilience, and engagement required for innovation. In general, this study attempts to broaden the scope of previous research conducted in the field of emotional intelligence.

Metacognitive Awareness as a Personal Resource

Metacognitive awareness refers to an individual's understanding of and ability to control their thinking, learning, and problem-solving skills (Schraw & Dennison, 1994). The concept is applied in the Job Demand-Resources (JD-R) model, which considers metacognitive awareness a personal asset that enables individuals to assess their performance and choose suitable approaches to cope with difficulties of their job. Higher education is characterized by the need to perform teaching, researching, supervising, and administrative work at the same time, which means that reflecting on one's own thoughts is of great importance for sustaining a successful performance in a challenging education system.

So far, research shows that metacognitive awareness plays a major role in self-directed learning, making decisions, solving problems, and performing successfully at studies. Metacognitive awareness was mostly studied with school students, students of higher education institutions, and student teachers, showing a positive correlation between metacognitive awareness and learning results, self-confidence, and success in studying. The findings indicate that metacognitive awareness can be treated as a significant mental resource that allows one to assess success, detect unworkable strategies, and make necessary changes.

Even though there is considerable information regarding university faculty, they have not attracted as much academic attention. This is quite an important gap because the faculty members do their jobs that call for very high levels of self-regulation constantly, which entails designing courses, doing research, supervising students, publishing scientific papers, and adjusting to the changing requirements of their institutions. Looking at these obligations, it should be noted that they require constantly reflecting, assessing, thinking strategically but seemingly metacognitive awareness still has not been studied as such.

The research is aimed at filling in this gap positioning metacognitive awareness as a personal resource of the teachers which enriches both their psychological capital and their engagement. It is claimed that faculty regularly reviewing their cognitive processes are more likely to get a better understanding of their capabilities and become more resilient when facing academic challenges and staying engaged in the work that they do.

Psychological Capital and Work Engagement as Parallel Motivational Channels

The two concepts of Psychological Capital and Work Engagement are key ideas associated with the motivational process as described by the Job-Demands Resources (JD-R) theory. Though the two ideas are different, both serve to provide positive psychological states through which employees can handle job challenges and perform their work proficiently. Psychological capital is an indication of the positive psychological resources possessed by a person. These resources include hope, self-efficacy, resilience, and optimism which assist people in achieving their goals (Luthans et al., 2007). In contrast, work engagement is characterized by high energy levels and enthusiasm for one's job (Schaufeli et al., 2006). International studies likewise report that employees with higher psychological capital and stronger work engagement are more resilient, productive, and willing to invest discretionary effort in their work.

Notwithstanding the reliability of previous research, there have been very few studies considering psychological capital and work

engagement together. In the greater part of existing literature, they are examined as factors that either affect each other or work in simple relation, with none of the studies calculating the role of both elements in the whole process of production of resources in the JD-R theory set forth by researchers. According to this theory, the two resource elements are closely interrelated. Thus, the more psychological resources an employee possesses, the abler he or she is to become engaged into work process.

In this regard, the current research sets psychological capital and work engagement as motivational elements of the model involving such variables as emotional intelligence and metacognitive awareness in its turn affecting psychological well-being. Thus, faculty representatives possessing high level of emotional and cognitive capabilities are likely to achieve higher level of resilience and optimism in their academic activities. Thus, the analysis of the two elements simultaneously enables to establish clearer view of the process of utilization of resources.

Psychological Well-Being as a Second-Stage Mechanism

Historically, psychological well-being has been seen mainly as an outcome of beneficial working conditions, but more recent investigations contend that it works as a tool in which psychological outcomes lead to essential work behavior. Psychologically healthy employees are more likely to engage in what is called discretionary efforts, welcome challenges and use creativity rather than just doing routine tasks.

In the sphere of higher education, recent research shows that faculty well-being has a positive link with innovative behavior and that favorable institutional environments make such connection even stronger (Lu et al., 2025). Meanwhile, studies reveal that psychological capital, along with work engagement, positively influences employee well-being by contributing to the development of resilience, optimism, and intrinsic motivation (Bakker & Demerouti, 2017). All these data make it clear that well-being is not simply a final destination point of individual or motivational

resources, rather it is a psychological state that promotes innovation.

Accordingly, this study positions psychological well-being as a second-stage mediator linking psychological capital and work engagement with innovative work behavior. This perspective extends the JD-R motivational process by explaining how accumulated personal and motivational resources are ultimately transformed into innovative behavior among university faculty.

Innovative Work Behavior as the Institutional Outcome

There is already empirical evidence of the outcome of psychological capital and engagement specifically in the context of higher-education faculty in Pakistan in terms of the innovative work behavior. It has been confirmed by Wahid and Ayub (2024) that psychological capital and perceived organizational support are jointly able to predict innovative work behavior in the context of higher education in Pakistan where 200 faculty members provided the necessary data collected by higher education institutions in Pakistan. The phenomenon is gaining traction also outside of Pakistan. In particular, Zargar, Daouk and Chahine (2025) concluded that work engagement and perceived organizational support as the predictors of innovative work behavior are valid as well. Moreover, it was recently proven that tenure-track systems were linked to faculty members' innovative work behavior through the influence of job insecurity. However, the nature of the existing relationship was not unequivocally positive or negative depending on how the job insecurity is perceived in a particular context (Yang, Cai and Cai 2024). The results outlined above serve as a confirmative data for saying that innovative work behavior continues to be a relevant research outcome in terms of academic staff not only in Pakistan but also all around the world.

Perceived Organizational Support as a Boundary Condition

Perceived organizational support is defined as an employee's belief that the organization values their contributions and cares about their well-being (Eisenberger et al. 1986). Its link to innovation has already been shown on multiple occasions within

academia; specific studies have indicated that organizational support predicts innovative work behavior through person-organization fit, and Wahid and Ayub (2024) demonstrate that organizational support and psychological capital both predict innovation as a string independent of one another. However, what has not been researched in Pakistan or otherwise is whether perceived organizational support boosts the relationship between well-being and innovation specifically, as opposed to playing its role at an earlier stage, when either engagement or psychological capital is formed. The current proposal is to list perceived organizational support as a moderator in the relationship in question.

Interconnections and the Present Study's Framework

By Although prior research has established meaningful relationships among emotional intelligence, metacognitive awareness, psychological capital, work engagement, psychological well-being, and innovative work behavior, important theoretical questions remain unresolved. Existing studies have generally examined these relationships in isolation, providing limited understanding of how multiple personal resources are transformed into innovative work behavior through interconnected psychological mechanisms, particularly within the higher education context.

From the perspective of the Job Demands-Resources (JD-R) theory, personal resources initiate motivational processes that promote positive work outcomes. However, comparatively little attention has been given to understanding how psychological capital and work engagement operate simultaneously as complementary motivational pathways, or how these pathways jointly contribute to faculty members' psychological well-being before fostering innovative work behavior. Likewise, psychological well-being has more often been conceptualized as an employee outcome than as an important mechanism linking resource accumulation with innovation.

One other unresolved issue is the role of perceived organizational support. Studies have mostly

focused on assessing organizational support as a precursor or direct predictor of innovative work behaviour. There has been less focus on the extent to which psychologically healthy faculty members translate their well-being into innovative work behaviors, and whether supportive environments in the workplace strengthen this impact.

The present research aims to fill these gaps by developing and testing an integrated JD-R model where emotional intelligence and metacognitive awareness are complementary personal resources, psychological capital and work engagement are parallel motivational pathways, psychological well-being acts as a mechanism explaining the impact of the previous personal and motivational pathways on innovative work behavior, and perceived organizational support is a boundary condition. The study explores this framework among faculty members of Pakistani public universities to better explain the combined contributions of personal and organizational resources to innovation in higher education.

Hypotheses Development

The connections proposed in this research originate from the JD-R motivational procedure discussed previously. In this way, personal resources always enhance psychological capital and engagement, and both processes produce well-being which is the predictor of innovations given organizational backing. Each connection appears below in brief, while Table 3 provides all hypotheses.

Emotional intelligence and metacognitive awareness appear to be equal, simultaneous precursors of psychological capital and work engagement. Faculty, who control their feelings properly, are able to perceive negative events – such as a rejected article, or harsh feedback from

students – as something manageable rather than threatening; thus, they manage to build the hope, efficacy, resilience, and optimism in them (Luthans et al. 2007), and thus cause the engagement (Schaufeli et al. 2006). Metacognitive awareness affects the process through another, although connected way. Faculty who control their performance in teaching and research will create a better perception of their efficiency over time (Schraw and Dennison 1994).

Psychological capital and work engagement are, in turn, proposed to predict psychological well-being. A faculty member who feels capable, hopeful, and resilient, and who is genuinely engaged rather than merely present, is well positioned — by both JD-R theory and prior Pakistani evidence — to report stronger psychological functioning overall (Bakker and Demerouti 2017; Sultana et al. 2024).

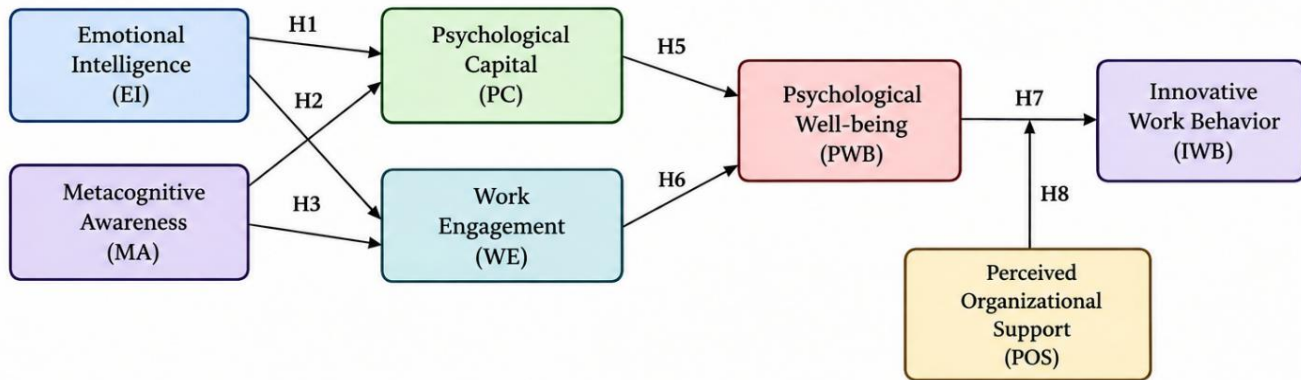
Well-being is positioned here not as an endpoint but as the mechanism through which the motivational sequence becomes visible as behavior. Faculty who are functioning well psychologically have the surplus capacity, in JD-R terms, to direct effort toward discretionary, innovation-oriented work rather than toward simply meeting minimum obligations (Lu, Xu, and Tian 2025).

Finally, perceived organizational support is proposed to moderate this last link specifically, rather than acting earlier in the sequence as prior Pakistani research has modeled it (Wahid and Ayub 2024). Faculty who feel well but institutionally unsupported have less reason to expect that innovative effort will be recognized or protected from administrative friction, and are accordingly expected to convert well-being into innovation less readily than faculty who feel both well and supported.

Table 3: *Summary of Hypotheses*

Hypothesis	Statement
H1	Emotional intelligence is positively related to psychological capital.
H2	Emotional intelligence is positively related to work engagement.
H3	Metacognitive awareness is positively related to psychological capital.
H4	Metacognitive awareness is positively related to work engagement.
H5	Psychological capital is positively related to psychological well-being.
H6	Work engagement is positively related to psychological well-being.
H7	Psychological well-being is positively related to innovative work behavior.
H8	Perceived organizational support moderates the well-being–innovative work behavior relationship, such that the relationship strengthens as support increases.
H9a	Emotional intelligence has a significant indirect effect on innovative work behavior through psychological capital and psychological well-being.
H9b	Emotional intelligence has a significant indirect effect on innovative work behavior through work engagement and psychological well-being.
H9c	Metacognitive awareness has a significant indirect effect on innovative work behavior through psychological capital and psychological well-being.
H9d	Metacognitive awareness has a significant indirect effect on innovative work behavior through work engagement and psychological well-being.

Conceptual Model



- H9a:** Emotional intelligence has a significant indirect effect on innovative work behavior through psychological capital and psychological well-being.
- H9b:** Emotional intelligence has a significant indirect effect on innovative work behavior through work engagement and psychological well-being.
- H9c:** Metacognitive awareness has a significant indirect effect on innovative work behavior through psychological capital and psychological well-being.
- H9d:** Metacognitive awareness has a significant indirect effect on innovative work behavior through work engagement and psychological well-being.

Methodology

Research Design

This study used a cross-sectional, quantitative survey design, consistent with the majority of published JD-R-grounded structural models in the organizational-behavior and higher-education literatures. A single time-point design was chosen because the study's primary aim was to establish the structure of the proposed pathway across a large, regionally diverse sample rather than to track change within individuals over time; the trade-offs of this choice, and how a future time-lagged extension could strengthen causal inference, are addressed in the limitations section.

Population and Sample

The target population comprised full-time faculty at public-sector universities across Punjab, Sindh, and the Islamabad Capital Territory, holding academic ranks from Lecturer through Professor and drawn from a range of disciplines including

management sciences, social sciences, natural sciences, engineering, and education. Public-sector institutions were chosen because they educate the majority of Pakistan's university students and operate under a common regulatory framework set by the Higher Education Commission, which allows findings to be interpreted against a shared institutional backdrop rather than across incompatible governance systems. Only full-time faculty with at least one year of teaching experience were eligible, since visiting and adjunct staff typically have less exposure to the organizational-support conditions the study measures.

A multi-stage purposive sampling technique was employed for recruiting respondents. The process began by selecting fourteen public sector universities from three different areas consisting of six from Punjab, five from Sindh, and three from Islamabad. The motive in their selection was to have variation in terms of the size of universities and their research capacity instead of having all the

universities of one type. The second stage of study was about identifying full-time faculty within the selected universities through the departmental directories and institutional contacts. A systematic combination of online and offline survey administration was used for inviting the identified faculty members for participation in the study. Out of the total 347 questionnaires circulated, 294 questionnaires were retrieved with an overall response rate of 84.7%. After screening, 14

questionnaires were excluded from the analysis due to excessive missing values. Moreover, another 10 questionnaires were eliminated as a result of identifying multivariate outliers and exhibiting the straight-lining response pattern. Consequently, a total of 270 usable responses were analyzed, leading to usable response rate of 77.8% which was adequate in light of PLS-SEM sampling guidelines for structural models of similar complexity (Hair et al., 2022).

Figure-1

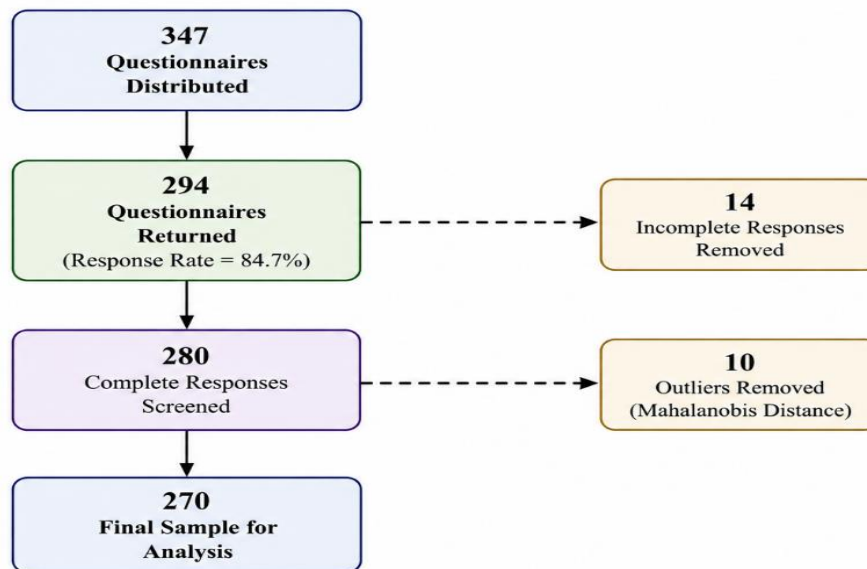


Figure 1. Flow of sample selection and data screening.

Note. Outliers were identified using Mahalanobis distance at $p < .001$.

Table 1: *Regional Distribution of the Sample*

Region	Public Universities	Valid Responses	Percentage
Punjab	6	118	43.7%
Sindh	5	94	34.8%
Islamabad Capital Territory	3	58	21.5%
Total	14	270	100.0%

Instrumentation

All constructs were measured using previously validated instruments (Table 2), each modeled as a

reflective latent variable and rated on a five-point Likert scale ranging from Strongly Disagree to Strongly Agree, a format widely used in higher-education survey research and well suited to PLS-

SEM estimation. Minor terminology adjustments were made throughout — replacing generic organizational language with wording specific to the university context — without altering the conceptual meaning of any item. Before full

deployment, the questionnaire was piloted with a small group of faculty outside the main sample to confirm item clarity, appropriate completion time, and face validity within the Pakistani higher-education setting.

Table 2: Measurement Instruments

Construct	Source	Items	Sample Item
Emotional Intelligence	Wong and Law (2002) — WLEIS	16	"I am able to control my emotions effectively."
Metacognitive Awareness	Schraw and Dennison (1994) — short form	18	"I regularly evaluate whether my approach to solving a problem is effective."
Psychological Capital	Luthans et al. (2007) — PCQ-12	12	"I feel confident representing my work area during academic discussions."
Work Engagement	Schaufeli et al. (2006) — UWES-9	9	"I am enthusiastic about my academic work."
Psychological Well-being	Ryff (1989) — 18-item version	18	"In general, I feel confident and positive about myself."
Perceived Organizational Support	Eisenberger et al. (1986) — SPOS-8	8	"My university values my contribution to its success."
Innovative Work Behavior	De Jong and Den Hartog (2010)	10	"I regularly introduce new ideas to improve the way work is carried out."

Procedure and Ethical Considerations

Data were collected through a combination of institutional email distribution and in-person paper administration, following institutional ethical review and approval. Participation was voluntary and anonymous throughout; an informed consent statement outlining the study's purpose and participants' rights was presented before any data collection began, and no identifying information was recorded at any stage.

Common Method Bias

Since all factors were evaluated by means of a single self-report measure, measures were incorporated into the design of the questionnaire to avoid common method bias from the beginning: predictor and criterion variables were positioned in different sections, simple and neutral wording was used in order to avoid prompting the hypotheses of the study, and anonymity of respondents was stressed in order to minimize concerns about being judged.

Data Analysis Strategy

Data were analyzed using Partial Least Squares Structural Equation Modeling in SmartPLS. The analysis was achieved in two stages. First, the measurement model was evaluated by looking into the indicators' loadings, composite reliability, average variance extracted, and discriminant validity using the heterotrait-monotrait ratio. In the second stage, the structural model was estimated using 5000 bootstrap samples in order to generate the correct confidence intervals of direct, indirect, and the moderated mediation effects. The predictive power was also tested using PLSpredict. The academic title, years of experience, curriculum, and location were put as control variables.

6. Results

This section reports the empirical findings using the two-stage partial least squares structural

equation modeling (PLS-SEM) procedure recommended by Hair et al. (2022). The measurement model was first evaluated for reliability and validity, followed by assessment of the structural model, including hypothesis testing, mediation, moderation, and predictive analyses.

6.1 Respondent Profile

Of 347 questionnaires distributed to full-time faculty at public-sector universities in Punjab, Sindh, and the Islamabad Capital Territory, 294 were returned (84.7% response rate). After removing 24 cases for excessive missing data, multivariate outliers, or straight-lining, 270 usable responses remained (77.8% effective rate), exceeding minimum PLS-SEM sample requirements (Hair et al., 2022). As shown in Table 3, respondents were drawn primarily from Punjab (43.7%), Sindh (34.8%), and Islamabad (21.5%), reflecting the study's intended regional scope.

Table 3: Demographic Profile of Respondents (N = 270)

Variable	Category	f	%
Gender	Male	173	64.1
	Female	97	35.9
Age (years)	Below 30	38	14.1
	31–40	109	40.4
	41–50	79	29.3
	Above 50	44	16.2
Academic rank	Lecturer	101	37.4
	Assistant Professor	82	30.4
	Associate Professor	53	19.6
	Professor	34	12.6
Teaching experience	1–5 years	61	22.6
	6–10 years	79	29.3
	11–15 years	63	23.3

Variable	Category	f	%
Region	Above 15 years	67	24.8
	Punjab	118	43.7
	Sindh	94	34.8
	Islamabad Capital Territory	58	21.5

Note. *f* = frequency.

6.2 Descriptive Statistics and Correlation Analysis

Means, standard deviations, and Pearson correlations of all the constructs of the study are presented in 4. Scores were generally favorable with mean scores between 4.08 and 3.62. The

bivariate correlations between all variables were positive and significant ($p < .01$) and the highest correlation was between psychological well-being and innovative work behavior ($r = .69$), which offered preliminary support for the hypothesized relationships.

Table 4: Means, Standard Deviations, and Correlations Among Study Variables

Construct	M	SD	1	2	3	4	5	6
1. Emotional Intelligence	3.98	0.56	—					
2. Metacognitive Awareness	3.91	0.58	.54**	—				
3. Psychological Capital	3.86	0.61	.56**	.52**	—			
4. Work Engagement	3.89	0.63	.49**	.55**	.61**	—		
5. Psychological Well-being	3.84	0.57	.47**	.50**	.66**	.63**	—	
6. Perceived Org. Support	3.62	0.69	.39**	.36**	.48**	.46**	.54**	—
7. Innovative Work Behavior	4.08	0.52	.46**	.48**	.58**	.60**	.69**	.55**

Note. $N = 270$. ** $p < .01$.

6.3 Common Method Bias

Because all constructs were measured via a single self-report survey, common method bias (CMB) was assessed. Procedural safeguards—respondent anonymity, validated scales, and randomized item order—were applied following Podsakoff et al. (2003). Statistically, Harman's

single-factor test showed the largest unrotated factor explained 31.84% of variance, well below the 50% threshold. Full collinearity VIFs ranged from 1.28 to 2.74, below the conservative 3.30 cutoff (Kock, 2015). Together, these results indicate CMB is unlikely to threaten the study's findings (Table 5).

Table 5: Assessment of Common Method Bias

Assessment	Criterion	Result	Decision
Harman's single-factor test	< 50% variance	31.84%	No concern
Full collinearity VIF	< 3.30	1.28–2.74	No concern

Note. *VIF = variance inflation factor.*

6.4 Measurement Model Assessment

Indicator reliability, internal consistency, and convergent validity were assessed following Hair et al. (2022). All outer loadings exceeded the 0.70 threshold (range = 0.724–0.918). Internal

consistency was confirmed via Cronbach's α (0.856–0.932) and composite reliability (0.895–0.944), both above 0.70. Convergent validity was supported, with average variance extracted (AVE) values ranging from 0.633 to 0.771, exceeding the 0.50 benchmark (Table 6).

Table 6: Reliability and Convergent Validity

Construct	Items	Loading range	α	CR	AVE
Emotional Intelligence	16	0.741–0.901	0.918	0.931	0.662
Metacognitive Awareness	18	0.724–0.889	0.901	0.918	0.649
Psychological Capital	12	0.736–0.902	0.914	0.928	0.684
Work Engagement	9	0.748–0.918	0.921	0.935	0.706
Psychological Well-being	18	0.731–0.894	0.889	0.914	0.642
Perceived Organizational Support	8	0.739–0.905	0.892	0.917	0.689
Innovative Work Behavior	10	0.752–0.913	0.932	0.944	0.771

Note. α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted.

6.5 Discriminant Validity

Discriminant validity was evaluated using the Heterotrait–Monotrait Ratio (HTMT), which offers a more rigorous test than traditional criteria (Hair et al., 2022). All HTMT values ranged from 0.39 to 0.82, remaining below the conservative 0.85

threshold (Table 7). The Fornell–Larcker criterion provided corroborating evidence: for every construct, the square root of AVE exceeded its correlations with all other constructs (Table 8). Together, these results confirm that the constructs are empirically distinct, supporting progression to structural model testing.

Table 7: Heterotrait–Monotrait Ratio (HTMT) Matrix

Construct	EI	MA	PsyCap	WE	PWB	POS
Emotional Intelligence (EI)	—					
Metacognitive Awareness (MA)	0.64	—				
Psychological Capital (PsyCap)	0.72	0.68	—			
Work Engagement (WE)	0.61	0.71	0.79	—		
Psychological Well-being (PWB)	0.59	0.63	0.82	0.80	—	
Perceived Org. Support (POS)	0.44	0.39	0.57	0.55	0.66	—
Innovative Work Behavior (IWB)	0.58	0.60	0.70	0.73	0.81	0.63

Note. All HTMT values fall below the recommended 0.85 threshold, supporting discriminant validity (Henseler et al., 2015).

Table 8: Fornell–Larcker Criterion

Construct	EI	MA	PsyCap	WE	PWB	POS
Emotional Intelligence (EI)	0.814					
Metacognitive Awareness (MA)	0.54	0.806				
Psychological Capital (PsyCap)	0.56	0.52	0.827			
Work Engagement (WE)	0.49	0.55	0.61	0.840		
Psychological Well-being (PWB)	0.47	0.50	0.66	0.63	0.801	
Perceived Org. Support (POS)	0.39	0.36	0.48	0.46	0.54	0.830
Innovative Work Behavior (IWB)	0.46	0.48	0.58	0.60	0.69	0.55

Note. Diagonal values (bold in original analysis) represent the square root of AVE and exceed corresponding inter-construct correlations, supporting discriminant validity.

6.6 Structural Model Assessment

Following Hair et al. (2022), the structural model was evaluated for collinearity, explanatory power (R^2), predictive relevance (Q^2), effect sizes (f^2), and path significance via bootstrapping with 5,000 resamples.

6.6.1 Collinearity

Inner VIF values ranged from 1.18 to 2.76, well below the 3.30 threshold, indicating collinearity did not bias the structural estimates (Table 9).

Table 9: Inner VIF Values

Endogenous construct	Predictor	VIF
Psychological Capital	Emotional Intelligence	1.42
	Metacognitive Awareness	1.42
Work Engagement	Emotional Intelligence	1.39
	Metacognitive Awareness	1.39
Psychological Well-being	Psychological Capital	2.31
	Work Engagement	2.27
Innovative Work Behavior	Psychological Well-being	2.76
	Perceived Organizational Support	1.84
	Interaction term (PWB × POS)	2.08

Note. All values fall below the recommended threshold of 3.30, indicating no problematic collinearity.

6.6.2 Explanatory Power (R^2)

The model explained 43.8% of variance in psychological capital, 39.6% in work engagement,

61.4% in psychological well-being, and 58.7% in innovative work behavior, reflecting moderate-to-substantial explanatory power, particularly for the two principal outcomes (Table 10).

Table 10: Coefficient of Determination (R^2)

Endogenous construct	R^2	Interpretation
Psychological Capital	0.438	Moderate
Work Engagement	0.396	Moderate
Psychological Well-being	0.614	Substantial
Innovative Work Behavior	0.587	Moderate to substantial

6.6.3 Predictive Relevance (Q^2)

Blindfolding-based Q^2 statistics were positive for all endogenous constructs (0.241–0.441),

confirming satisfactory predictive relevance (Table 11).

Table 11: *Predictive Relevance (Q^2)*

Endogenous construct	Q^2
Psychological Capital	0.262
Work Engagement	0.241
Psychological Well-being	0.398
Innovative Work Behavior	0.441

Note. All Q^2 values exceed zero, indicating satisfactory predictive relevance.

6.6.4 Effect Size (f^2)

Following Cohen's (1988) benchmarks (0.02 = small, 0.15 = medium, 0.35 = large), emotional intelligence and metacognitive awareness exerted small-to-moderate effects on psychological capital

and work engagement. Psychological capital and work engagement each showed moderate effects on psychological well-being, which in turn exerted the largest effect on innovative work behavior—underscoring its central role in the model (Table 12).

Table 12: *Effect Sizes (f^2) of Predictor Constructs*

Predictor	Outcome	f^2	Interpretation
Emotional Intelligence	Psychological Capital	0.187	Medium
Metacognitive Awareness	Psychological Capital	0.142	Medium
Emotional Intelligence	Work Engagement	0.078	Small–medium
Metacognitive Awareness	Work Engagement	0.193	Medium
Psychological Capital	Psychological Well-being	0.168	Medium
Work Engagement	Psychological Well-being	0.135	Medium
Psychological Well-being	Innovative Work Behavior	0.412	Large
Perceived Organizational Support	Innovative Work Behavior	0.089	Small
PWB × POS (interaction)	Innovative Work Behavior	0.041	Small

Note. f^2 interpreted per Cohen (1988): 0.02 = small, 0.15 = medium, 0.35 = large.

6.6.5 Hypothesis Testing (Direct Effects)

Bootstrapping (5,000 resamples) supported all proposed direct paths (Table 13). Emotional intelligence significantly predicted psychological capital ($\beta = .412, p < .001$) and work engagement ($\beta = .271, p < .001$), supporting H1 and H2. Metacognitive awareness significantly predicted

psychological capital ($\beta = .361, p < .001$) and work engagement ($\beta = .426, p < .001$), supporting H3 and H4. Psychological capital ($\beta = .391, p < .001$) and work engagement ($\beta = .352, p < .001$) significantly predicted psychological well-being, supporting H5 and H6. Psychological well-being strongly predicted innovative work behavior ($\beta = .587, p < .001$; H7), and the interaction between well-being

and perceived organizational support was also significant ($\beta = .149, p = .008; H8$).

Table 13: Structural Path Results

Hypothesis	Path	β	t	p	Decision
H1	EI $\rightarrow$ PsyCap	0.412	7.94	< .001	Supported
H2	EI $\rightarrow$ WE	0.271	4.86	< .001	Supported
H3	MA $\rightarrow$ PsyCap	0.361	6.88	< .001	Supported
H4	MA $\rightarrow$ WE	0.426	8.11	< .001	Supported
H5	PsyCap $\rightarrow$ PWB	0.391	7.52	< .001	Supported
H6	WE $\rightarrow$ PWB	0.352	6.81	< .001	Supported
H7	PWB $\rightarrow$ IWB	0.587	11.76	< .001	Supported
H8	PWB $\times$ POS $\rightarrow$ IWB	0.149	2.67	.008	Supported

Note. Bootstrapping performed with 5,000 resamples. β = standardized path coefficient.

Figure 2: Final structural model with standardized path coefficients and coefficients of determination (R^2).

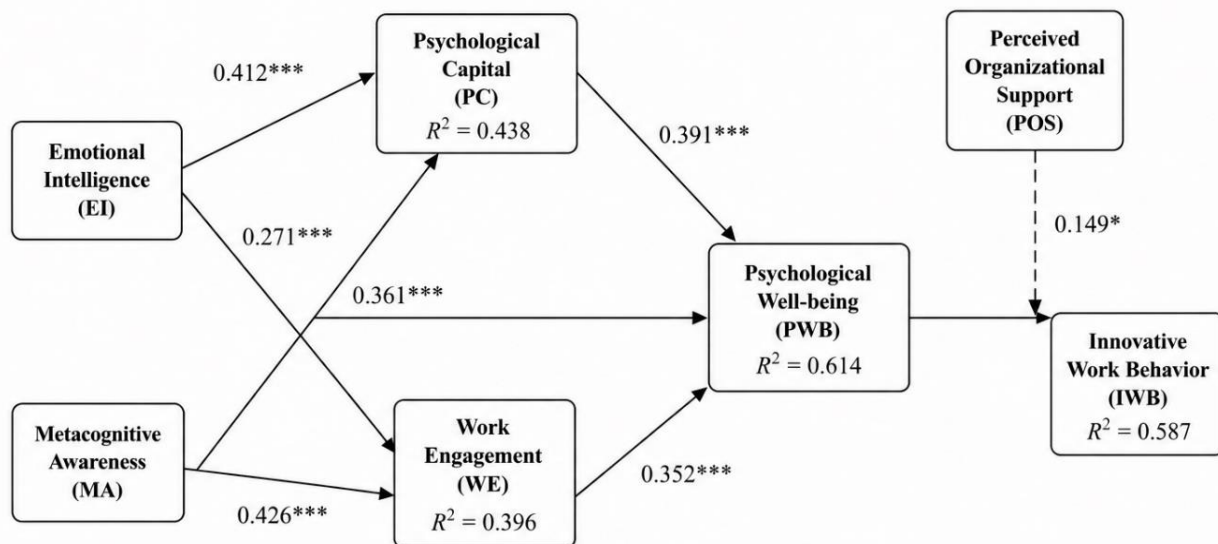


Figure 2. Final structural model with standardized path coefficients and R^2 values.

Note. Values are standardized path coefficients (β). R^2 = coefficient of determination.

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed).

6.7 Mediation Analysis

Bootstrapped indirect effects (5,000 resamples) showed that psychological capital and work engagement, operating through psychological well-being, significantly mediated the effects of emotional intelligence and metacognitive awareness on innovative work behavior (Table

14). All indirect paths were significant ($\beta = .056-.095$, $p \leq .002$), with 95% confidence intervals excluding zero, supporting H9a, H9b, H9c, and H9d. These results suggest that personal resources foster innovation primarily by strengthening psychological capacities that subsequently elevate well-being, consistent with the resource-gain logic of Job Demands–Resources (JD-R) theory.

Table 14: *Specific Indirect Effects (Bootstrapping Results)*

Hypothesis	Indirect path	β	t	p	95% CI	Decision
H9a	EI → PsyCap → PWB → IWB	0.095	4.21	< .001	[0.053, 0.142]	Supported
H9b	EI → WE → PWB → IWB	0.056	3.08	.002	[0.024, 0.097]	Supported
H9c	MA → PsyCap → PWB → IWB	0.083	3.87	< .001	[0.041, 0.128]	Supported
H9d	MA → WE → PWB → IWB	0.088	4.46	< .001	[0.051, 0.137]	Supported

Note. *Bootstrapping performed with 5,000 resamples. Indirect effects are significant when the 95% CI excludes zero.*

Overall, faculty who are emotionally competent and metacognitively skilled tend to remain optimistic, resilient, and engaged, which sustains their psychological well-being and, in turn, fosters innovative work behavior. Given the demanding teaching, research, and administrative loads in Pakistani public universities, strengthening these psychological mechanisms may offer an effective route to sustained academic innovation.

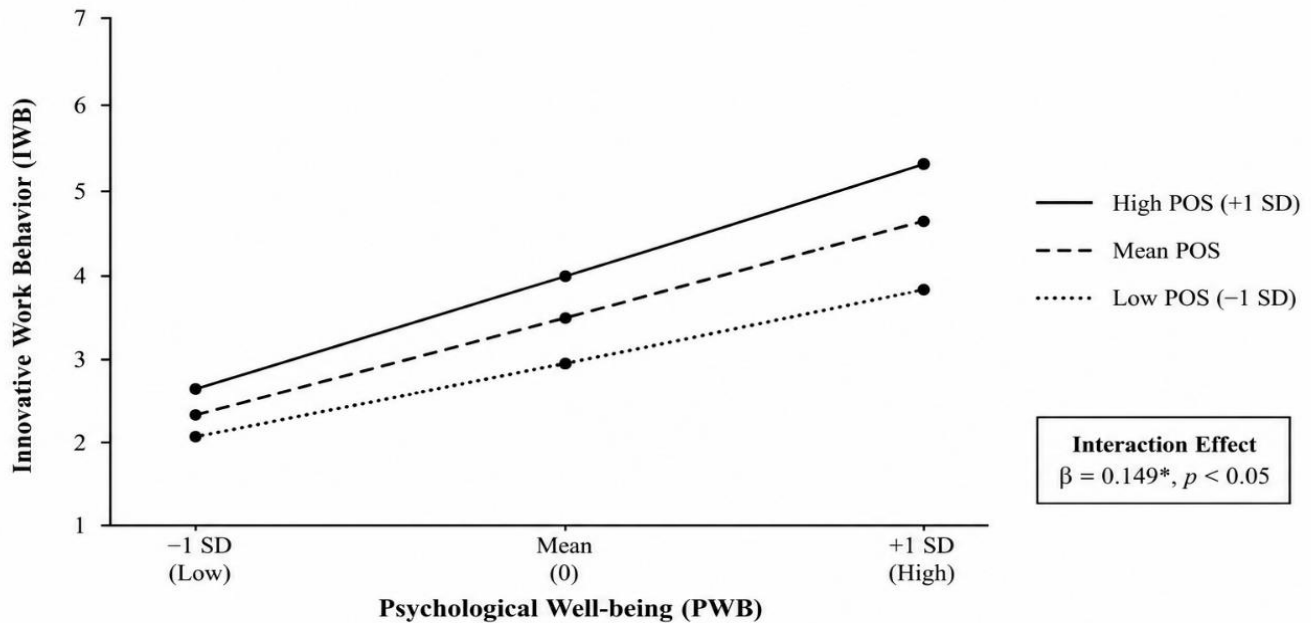
6.8 Moderation Analysis

Using the two-stage approach for reflective constructs (Hair et al., 2022), an interaction term between psychological well-being and perceived organizational support was tested. The interaction was positive and significant ($\beta = .149$, $t = 2.67$, $p = .008$), supporting H8 (Table 15). Simple slope analysis indicated that the well-being–innovation relationship was steeper under high organizational support than under low support, suggesting that supportive institutional environments help faculty convert psychological strengths into innovative teaching, research, and curricular practices.

Table 15: *Moderation Analysis*

Hypothesis	Interaction path	β	t	p	95% CI
H8	PWB × POS → IWB	0.149	2.67	.008	[0.042, 0.251]

Note. *Supported. Bootstrapping performed with 5,000 resamples.*

Figure 3: Moderating Effect of Perceived Organizational Support**Figure 3.** Moderating effect of perceived organizational support on the relationship between psychological well-being and innovative work behavior.

Note. Values on the axes represent standardized scores. POS = Perceived Organizational Support.

* $p < 0.05$ (two-tailed).

Figure note. The positive relationship between psychological well-being and innovative work behavior is stronger under high, versus low, perceived organizational support.

6.9 Predictive Assessment (PLSpredict)

Following Shmueli et al. (2019), predictive capability was assessed using PLSpredict with 10-fold cross-validation (10 repetitions). The PLS

model produced lower RMSE values than a linear regression benchmark for most innovative work behavior indicators, and all Q^2_{predict} values were positive (Table 16), confirming satisfactory out-of-sample predictive power.

Table 16: PLSpredict Results

Indicator	Q^2_{predict}	PLS-RMSE	LM-RMSE	Predictive performance
IWB1	0.368	0.612	0.654	High
IWB2	0.392	0.587	0.624	High
IWB3	0.351	0.604	0.639	High
IWB4	0.379	0.596	0.628	High
IWB5	0.401	0.581	0.617	High

Note. Positive Q^2_{predict} values and lower PLS prediction errors relative to the linear benchmark indicate satisfactory predictive performance.

6.10 Summary of Hypothesis Testing

Table 17 summarizes the results of all proposed hypotheses. All twelve hypotheses were supported: emotional intelligence and metacognitive awareness enhanced psychological capital and work engagement, which in turn strengthened psychological well-being—the strongest direct predictor of innovative work

behavior. Psychological capital and work engagement served as significant mechanisms linking personal resources to innovation, while perceived organizational support amplified the well-being–innovation relationship. Collectively, these findings provide strong empirical support for the proposed model and the Job Demands–Resources theory.

Table 17: *Summary of Hypothesis Testing*

Hypothesis	Proposed relationship	Decision
H1	EI → PsyCap	Supported
H2	EI → WE	Supported
H3	MA → PsyCap	Supported
H4	MA → WE	Supported
H5	PsyCap → PWB	Supported
H6	WE → PWB	Supported
H7	PWB → IWB	Supported
H8	POS moderates PWB → IWB	Supported
H9a	EI → PsyCap → PWB → IWB	Supported
H9b	EI → WE → PWB → IWB	Supported
H9C	MA → PsyCap → PWB → IWB	Supported
H9d	MA → WE → PWB → IWB	Supported

Discussion

This study aimed to investigate the influence of emotional intelligence and metacognitive awareness on innovative work behavior among university teachers in Pakistan. This empirical investigation also established the linkages between these variables with the assistance of self-efficacy, work engagement, psychological well-being, and perceived organizational support. The results provide evidence for the support of a process of

motivation based in JD-R theory which demonstrates that personal resources induce innovation through empowering employees, rather than influencing their innovative behavior directly.

Further examination into the relationships of emotional intelligence with both psychological capital and work engagement proved that a faculty member with emotional intelligence is successfully able to adapt to the academic workload as well. In

order to fulfill the requirements of teaching, researching, supervising and administrating faculty members are often forced to balance these competing duties which require very limited amount of time and energy but due to the raised levels of emotional intelligence, it is possible for an academic to preserve an adequate level of optimism, confidence, and commitment. This finding reinforces the JD-R perspective that personal resources help individuals build additional psychological resources over time and is consistent with earlier research highlighting the importance of emotional intelligence in promoting positive work-related outcomes (Bakker & Demerouti, 2017; da Costa et al., 2021).

The importance of metacognitive awareness was also found. Frequent self-assessment and modification of thinking approaches were associated with greater psychological capital and work engagement of the faculty. Whereas there have been many studies on metacognitive awareness in learners, the results of this study indicate that it can also be used as a useful tool for university teachers. Reflective thinking seems to be useful for academics in adapting to the new teaching, research and institutional contexts, which enhances their psychological resilience and their motivation to stay on in the profession.

The results also indicated that psychological capital and work engagement had a positive impact on psychological well-being. The results do not indicate that well-being can be understood as a consequence of good working conditions, but rather as a product of the resources and personal and motivational changes that have accumulated in the course of daily academic life. When faculty are optimistic, resilient, and fully engaged, they are more likely to be psychologically functioning well even in challenging institutional environments. This is consistent with the main tenets of JD-R theory, which stipulate that personal and job resources start motivational processes that result in healthier, more productive employees.

The correlation between psychological well-being and innovative work behavior is crucial evidence in proving that the nature of innovation does not

depend solely on technical skills and professional expertise of the faculty members. This means that the level of innovation relies on the psychological ability of academic staff to put effort into putting new ideas into practice. Academics whose level of psychological well-being is high may tend to be more open to trying new ways of teaching and searching for innovative research opportunities or making a contribution to the development of a higher education institution. It can be explained by the positive emotional and psychological state of employees allowing them to broaden the limits of usual performance.

Furthermore, the analysis of mediation shows how innovation is formed. The findings indicate that the influence of emotional intelligence and metacognitive awareness on innovative work behavior operated through the proposed sequential pathways involving psychological capital or work engagement and psychological well-being. These results highlight that faculty innovation develops through a resource-building process rather than through personal resources alone.

The moderating role of perceived organizational support further highlights the importance of the institutional context. Faculty who were more innovative were psychologically healthy, although the relationship was stronger when they felt more supported by the organization. This discovery indicates that innovation is not necessarily sustained by individual strengths. New ideas are more easily adopted by faculty members when they feel that their university is receptive to their work, supportive, and appreciative of innovation. Supportive organizational practices in such resource-constrained higher education systems like Pakistan thus seem to be significant in terms of the meaningful institutional outcomes obtained through them.

Theoretical Contributions

The findings of this research make several important contributions to the Job Demands–Resources (JD-R) literature and to the innovative work behavior in higher education research. It incorporates the emotional intelligence and

metacognitive awareness as additional personal resources into JD-R theory. While no studies have examined these personal resources separately, the current results show that these personal resources, when combined, can be used to develop psychological resources that can lead to innovative work behavior among university lecturers.

Furthermore, the study contributes to the JD-R framework by placing psychological capital and employee engagement on parallel motivational paths and assuming that both resources impact psychological well-being. These pathways are not mutually exclusive but rather act in concert to bolster faculty members' psychological functioning and offer a more holistic view of the motivational processes behind innovative work behavior in higher education.

An important contribution has been in the conceptualization of psychological well-being. Previous studies on JD-R have largely focused on psychological well-being as an outcome of employees, and not much research has been conducted on psychological well-being as a mechanism between personal and motivational resources and innovative work behavior. Based on the present results, psychological well-being can be assumed to be an important psychological mechanism that transforms accumulated personal and motivational resources into innovative work behavior. This view extends JD-R theory to include well-being as an integral part of the motivational process, instead of an outcome.

In addition, the results presented show that perceived organizational support is an important contextual boundary condition that enhances the positive relationship between psychological well-being and innovative work behavior. The study contributes to the understanding of the interplay between personal and organizational resources in supporting innovation by demonstrating how supportive organizational environments can help faculty members leverage their psychological resources to innovate more effectively.

Lastly, through the analysis of these connections among faculty members in Pakistani public universities, this study provides empirical

evidence from a lesser-studied context of higher education in developing countries. The results consequently validate the generalizability of the JD-R framework and present situation-specific information on the psychological and organizational elements that can foster innovative work behavior among a university faculty population.

Practical Implications

This study has many implications for higher education leaders, policymakers, and university administrators. The fact that emotional intelligence and metacognitive awareness were identified as significant personal resources, suggests that the universities put important emphasis on their development in faculty preparation programs through training, mentoring, reflection teaching and PD. Developing these skills could support faculty to better cope with academic workload and increase their psychological resources and engagement.

The findings further underscore the need to establish a conducive work environment for sustaining faculty members' psychological well-being. Appropriate performance expectations should be accompanied by policies on the part of the university's management to help achieve manageable workloads, opportunities for professional development, acknowledgment of academic accomplishments, and access to well-being support programs. These practices can boost psychological capital and work engagement, which can set up the environment for innovative teaching, research, and service activities.

Furthermore, the results indicate that the effect of both individual capabilities on innovation is moderated by perceived organizational support, meaning that individual capabilities are not enough to optimize innovation. To this end, universities should strive to create supportive climates within their organisations, with transparent leadership, fair decision making, positive feedback and institutional recognition of innovative contributions. Faculty members who feel that their universities appreciate their work and are concerned about their welfare are more

likely to transform their psychology and turn it into innovative work behavior.

In general, the results show that in order to enhance faculty innovation, a holistic approach is needed that focuses on enhancing individual psychological resources while simultaneously building supportive organizational practices. Personal development and institutional support investments are thus likely to lead to more sustainable gains in innovation in higher education.

Limitations and Future Research

A number of limitations need to be recognized. With the cross sectional design, causal inferences are restricted and a longitudinal or time (lag) design might be used to look at how psychological resources develop over time in future studies. The study was conducted on public sector universities of Pakistan and the results may not be generalized on other national or private universities. While the procedural and statistical corrections indicated common method bias was not likely to be a problem for the results, future studies might be able to use self-reported data along with supervisor ratings or objective measures of innovative performance. Future research can also be used to expand on the proposed framework by considering other organizational factors that may

have a positive impact on faculty innovation, such as transformational leadership, a psychological safety culture, or an organizational learning climate or digital readiness.

Conclusion

This research shows that the innovative work behavior of university faculty is more of an outcome of the resource building process than being just personal capacities. Emotional intelligence and metacognitive awareness positively affect psychological capital and work engagement and in turn psychological well-being and innovative work behavior. Additionally, the results indicate that perceived organizational support plays a multiplicative role in this process, allowing faculty to leverage their psychological strengths into innovative teaching, research and academic behaviors. The study extends the understanding of how personal resources and organizational resources work together to facilitate faculty innovation, by incorporating these relationships within the Job Demands–Resources (JD-R) model. In sum, the results suggest that fostering innovation in higher education involves investing in individual talents as well as establishing conducive institutional contexts that enable faculty wellbeing, engagement, and ongoing innovation.

Declaration of Conflicting Interest

The author declared no potential conflicts of interest with respect to research.

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