

# COGNITIVE STRATEGY AS A MECHANISM FOR EMPLOYEE ENGAGEMENT IN THE INFORMATION TECHNOLOGY SECTOR: A JD-R MODEL EXTENSION

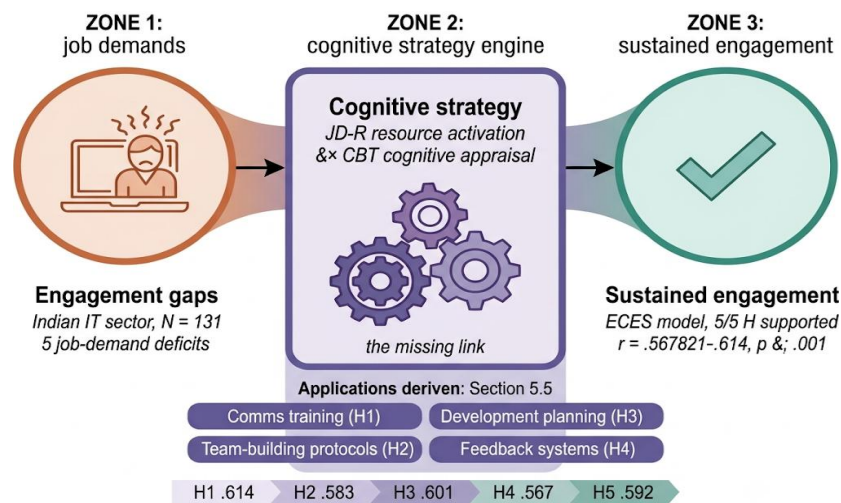
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**Abstract:** Despite the Job Demands–Resources (JD-R) model’s promise of a link between the resources an employee possesses and their engagement, there is no indication in the model of how the employee cognitively transforms the resources into engagement, especially in the context of the Indian IT sector, which is experiencing high attrition, cognitive overload, and a decline in employee engagement due to the post-pandemic digital transformation. Cognitive strategy as a mechanism for engagement was tested by comparing five engagement gaps with five cognitive strategy interventions: leadership communication failure, team cohesion difficulty, competency development deficiency, poor feedback and organizational awareness deficit. A cross-sectional survey of 131 IT staff working in Tamil Nadu, India was analyzed using Pearson correlation (SPSS 26.0;  $\alpha = .913$ ). All five gap–strategy pairs were significantly positively associated ( $r = .567-.614$ ,  $p < .001$ ) and a new Employee Cognitive Engagement Strategy (ECES) model was developed that extends JD-R theory and has implications for HR practice for sustainable engagement.

**Keywords:** Cognitive Strategy, Employee Engagement, IT Sector, JD-R Model



Graphical Abstract

# 1. INTRODUCTION

The IT industry is one of the most demanding and job-loss-prone industries in today's economies. The attrition rate in India's IT sector has consistently been a structural problem, standing at 23.4% during the fiscal year 2022–2023 (NASSCOM, 2023). The combination of high turnover, cognitive overload, and fragmentation of remote work in the post-pandemic era has taken a toll on the factors that create and sustain employee engagement (Attridge, 2009; Bakker et al., 2023). This pattern is corroborated within the Indian IT sector specifically, where job insecurity and heavy perceived workload have been shown to significantly erode career commitment among IT professionals (Deshpande & Chakraborty, 2023). Erosion has a special significance in India, as the IT workforce is young, and precarious employment is a risk factor for mental health, creating a cycle of disengagement and turnover among young adult employees (Umicevic et al., 2021). Techno-stress arising from this same combination of demands has also been found to interact with gender in shaping IT employees' work–personal conflict, indicating that engagement erosion in this sector is not uniformly distributed across the workforce (Kumari, 2025). The implications of productivity loss are immediate for organizational performance, innovation potential, and competitive position. Thus, the determinants of IT sector employee engagement are both theoretical and managerial issues.

The Job Demands–Resources model (Bakker & Demerouti, 2007) is the prevailing theory about the dynamics of engagement. The model assumes that the impact of two general classes of work characteristics – job demands and job resources – on employee engagement and burnout outcomes is combined. A motivational process occurs when resources are adequate to meet demands and helps maintain engagement; when resources are persistently insufficient, burnout occurs. A considerable amount of empirical support for the JD-R model has been obtained in the fields of service, healthcare, and technology (Halbesleben, 2010; Schaufeli & Taris, 2014). A missing element in the model remains, however: it is assumed that resources stimulate employees to become more engaged, but the cognitive process by which employees translate resource availability into actual engagement is not theorized. Within this framework, however, the psychological process of how employees access resources and turn that access into action (engagement) is not specified, namely the cognitive strategy that leads to appraisal, reframing and mobilizing available resources.

Cognitive Behavioral Theory (CBT; Beck, 1979) specifically targets this area. CBT suggests that the way people perceive environmental cues (cognitive appraisal) explains the link between environmental conditions and behaviors. If applied to the work situation, CBT would suggest that workers who use adaptive cognitive strategies will be more engaged regardless of the level of objective demands, because cognitive processing of those demands provides the motivational energy (Meichenbaum, 1977). Positive psychological capital (self-efficacy, optimism, and resilience) has also been proposed as a personal resource within the JD-R architecture that connects access to resources with engagement behavior (Meyers et al., 2013). Evidence for this self-efficacy mechanism exists beyond Western settings: In the context of entrepreneurship, entrepreneurial self-efficacy serves as a mediator between organizational context and action orientation, suggesting that self-efficacy is not context-specific but rather acts as a general-purpose cognitive mediator between organizational context and action (Urban & Maswabi, 2021). Complementary evidence from the education sector indicates that self-efficacy operates jointly with psychological safety to drive employee engagement, suggesting that the self-efficacy mechanism is strengthened rather than substituted for when paired with a second, climate-level cognitive resource (Eapen et al., 2025). However, although there is a theoretical convergence, there is no empirical test on whether the operationalisation of the concept of cognitive strategy is an enabling mechanism for employee engagement in contexts of the IT sector, which was confirmed by a systematic search in Scopus using the string TITLE-ABS-KEY ('cognitive strategy' AND 'employee engagement' AND 'IT sector') and found no papers in the last seven years (2020–2026).

The present study seeks to fill this gap by examining whether there are significant relationships between the operationalization of cognitive strategies (job engagement support, co-worker facilitation, employee development programming, structured communication feedback, and organizational identification) and the five identified engagement deficits in IT organizations. The study has four contributions. First, it is an extension of the JD-R model, which theorizes cognitive strategy as an organizational resource that specifies the mechanism by which resource availability translates into engagement behavior. Second, it is the first empirical test in an Indian IT sector sample ( $N = 131$ ). Third, it develops the Employee Cognitive Engagement Strategy (ECES) model as a framework that practitioners can deploy based on the empirical pattern. Fourth, it promotes Sustainable Development Goal 8 – Decent Work and Economic Growth – through evidence-based strategies to enhance workforce engagement and retention in a growth industry.

## 2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

### 2.1 *The Job Demands–Resources Model and Its Cognitive Limitation*

Bakker and Demerouti (2017) adapted the JD-R model to serve as a flexible perspective across occupational contexts, stating that job demands (physical, psychological, social, or organizational aspects of work that require effort) lead to strain. In contrast, job resources (functional, physical, psychological or social aspects of work that enable goal achievement) lead to motivation and engagement. This is especially relevant to the current study, as the motivational pathway shows that when resources are adequate to buffer the demands, employees are motivated to invest more effort in the organization, to increase organizational commitment, and to improve performance (Bakker et al., 2008). In line with the theory of the organization as a resource, this resource-based reading views the organization as an instrument for achieving goals, an interest group, and a process for structuring and distributing resources among members (Gosnik & Kavcic, 2021).

There is a wide range of empirical evidence supporting the JD-R model. Schaufeli and Taris (2014) conducted a meta-analysis of 87 studies, all of which showed that resources (social support, autonomy, feedback, and skill variety) predicted the three Utrecht Work Engagement Scale (UWES) dimensions of engagement: vigor, dedication, and absorption. Specifically, in the field of IT, Rana et al. (2014) showed that job resources were significantly related to engagement and negatively related to turnover intention of software professionals. Narayanan et al. (2011) also showed that a set of mental frameworks that IT professionals use to interpret and respond to their work environment (cognitive structures) is an important factor in strategic performance. The cognitive dimension has gained new relevance in the context of the digital transformation of organizations and IT, where leadership approaches must change to remain engaged and leading in the Industry 4.0 environment (Bach & Sulíková, 2021). Consistent with this resource-based account, job crafting has been shown to mediate the relationship between psychological climate and work engagement among academic professionals, confirming that engagement gains from JD-R resources are transmitted through an intervening cognitive-behavioral process rather than occurring directly (Kaur et al., 2025).

However, there is a limit to the model's explanatory power: the mechanism by which employees activate available resources is not specified. Resource utilization is considered an outcome-level variable rather than a process-level variable. This leaves unanswered the basic question: why is there a difference in the engagement levels of two employees with the same access to resources, and how can cognitive theory help answer it?

### 2.2 *Cognitive Behavioural Theory and Workplace Application*

According to Beck's (1979) Cognitive Behavioral Theory, events do not cause emotional and behavioral reactions; it is the interpretation of these events that does. The cognitive triad of self-perception, environmental interpretation, and future expectation influences individuals' interactions with their work context. Adaptive cognitive strategies such as cognitive reframing, behavioral activation, and problem-solving in collaboration lead to positive emotional and motivational states even when there is an increase in demand, as they change appraisals rather than the objective situation (Seligman, 1991).

CBT-based models have been used in organizations for stress management, leadership development, and organizational learning (Turi et al., 2019). Sacramento and Fischmann (2019) showed that both cognitive and structural factors are necessary for successful strategy implementation, with cognitive factors (interpretation accuracy and adaptive reframing) having an independent effect. Cognitive and motivational factors such as perceived competence, relational support, and feedback receptivity are important determinants of employee engagement in industry contexts, as shown by Chandani et al. (2016). Recent studies in the technology-adjacent service sector also reveal that emotionally intelligent appraisal (both interpersonal and intrapersonal regulation) is associated with employee performance, and that it can be used as a mediator in the relationship between management and employee conflict, further underscoring the importance of individual-level cognitive-emotional processing in organizational engagement systems (Gaya et al., 2025).

The combination of JD-R and CBT is theoretically fruitful, as it fills the gap in JD-R regarding the operationalization of cognitive strategies as a psychological resource for converting resource availability into engagement behavior. If cognitive strategies are implemented at the organizational level (communication processes, development programs, team cohesion processes), they serve as resources in JD-R terms and trigger a motivational process that leads to sustained engagement.

## 2.3 Engagement Gap Identification and Hypothesis Development

In the present study, the five engagement gaps are operationalized based on the literature on JD-R and CBT and validated through a pilot review of HR documentation from IT organizations. There are five directional hypotheses, each corresponding to one of the gaps and to a theoretically derived cognitive strategy intervention.

### H1: Leadership Communication and Job Engagement

Leadership Communication Quality is a job resource that is well established in terms of JD-R. Symmetrical, consistent leadership communication was found to be a significant predictor of employee engagement as it positively influenced the quality of the employee–organization relationship (Kang & Sung, 2017). This result is consistent with the general trend in the leadership literature that transformational and communicative leadership styles are the strongest predictors of positive employee outcomes (Hagemann, 2022). This predictive relationship extends into emerging work contexts as well: transformational leadership has been shown to significantly improve employee readiness for Industry 5.0 technologies through a double-mediation pathway, indicating that its engagement-relevant effects operate through intervening cognitive and attitudinal states rather than directly (Hoblos et al., 2025). Interpretive ambiguity is a cognitive load that occurs when leaders fail to convey a clear strategic message, leaving employees unable to engage in their jobs (Bhardwaj et al., 2021). The cognitive and affective commitment of employees to their work tasks is a CBT-inspired approach that allows employees to find meaning and direction in a task situation without being dependent on the strategic ambiguity of the overall situation (Rich et al., 2010; Christian et al., 2011). Accordingly:

H1: Leadership communication failure is significantly and positively associated with the adoption of job engagement as a compensatory cognitive strategy.

### H2: Team Cohesion Difficulty and Co-Worker Support

The social challenge of combining different personality types into effective teams is the interpersonal strain within the JD-R framework, which results in decreased collective engagement (Chiaburu & Harrison, 2008). Co-worker support, which encompasses informational, emotional, and functional forms of support among co-workers, is a social resource that lessens personality-integration difficulties through reciprocal exchange processes (Blau, 1964; Akgunduz & Eryilmaz, 2018). This personality-linked strain is corroborated among Indian public-sector employees, where dispositional traits have been shown to shape performance indirectly through job-crafting behavior rather than directly, indicating that a compensatory behavioral mechanism – rather than personality alone – carries the outcome (Varma et al., 2024). Co-worker support from a CBT perspective helps reframe interpersonal issues and turn potential stressors into problem-solving opportunities. Accordingly:

H2: Team cohesion difficulty is significantly and positively associated with co-worker support as an engagement-enabling cognitive strategy.

### H3: Competency Development Deficiency and Employee Development

The organization's lack of employee competence development constitutes a resource deficit in JD-R terms that directly impacts the growth satisfaction aspect of engagement (Bailey, 2022). Employee development (operationalized as structured skill building and growth pathway provision) is a job resource and a cognitive strategy, offering employees an appraisal system that provides them with a future-oriented view of their job, and thus helps them stay motivated because they have a clear idea of what they are working towards (Elena, 2000). Verčič (2021) found that organizational support for development was an important direct predictor of satisfaction with internal communication and an indirect predictor of engagement. In the context of the Indian labor market, competency development is a measurable resource rather than merely a symbolic gesture, as it has been shown to significantly impact labor market outcomes, including workforce participation (Santra & Kundu, 2025). Accordingly:

H3: Competency development deficiency is significantly and positively associated with employee development programming as an engagement-enabling cognitive strategy.

### H4: Poor Communication Feedback and Employee Communication

Poor communication and feedback systems and a lack of informational resources can deprive employees of the information necessary for job calibration, goal adjustment, and cognitive self-regulation and can be viewed as job

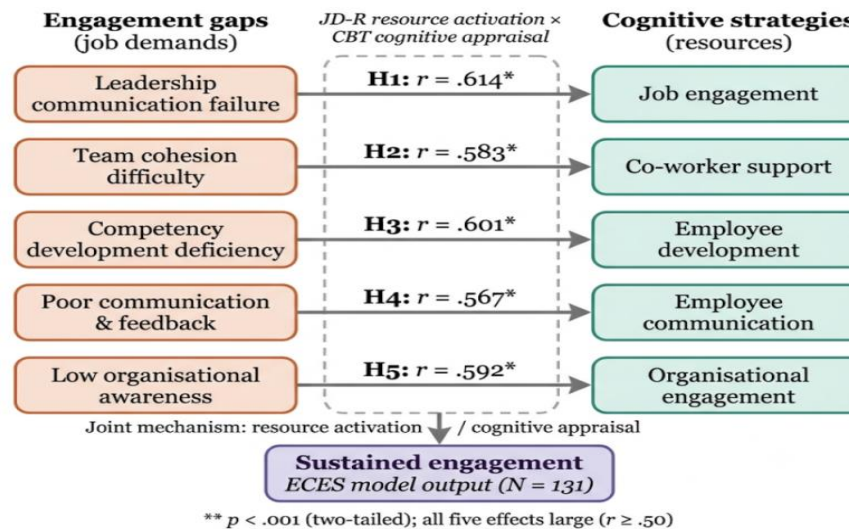
demands in JD-R terms because they increase interpretive uncertainty (Lundberg & Brownell, 1993). Left unaddressed, this informational gap tends to manifest as workplace ostracism, which has been conceptually linked to reduced job performance in post-pandemic “new normal” work arrangements, underscoring that a communication deficit carries consequences beyond the individual employee to the surrounding team (Giri et al., 2023). Structured employee communication is a manifestation of the CBT principle of reality-testing. It involves regular feedback loops, multidirectional communication, and accessible management, which enable employees to gauge their performance and adjust their engagement as needed accurately. Accordingly:

H4: Poor communication and feedback quality is significantly and positively associated with structured employee communication as an engagement-enabling cognitive strategy.

H5: Organizational Awareness Deficit and Organizational Engagement

Knowing the organization’s mission, values, and strategic direction is a psychological resource that helps maintain dedication to the organization, a component of engagement (Kahn, 1990). Without this awareness, when employees do not understand the link between their work and the organization’s outcomes, the link between the individual, their work, and the organization is broken, leading to psychological disengagement from work. Organizational engagement (the deliberate creation of employee attachment to organizational goals through structured awareness mechanisms) is a CBT-aligned resource that re-establishes the cognitive connection between effort and meaning (Casper et al., 2018; Purcell, 2012). This identification mechanism is especially relevant for a young workforce, as employees’ expectations of employers’ purpose and identity have been shown to affect brand-level engagement outcomes in similar service-sector organizations (Heilmann et al., 2022). Accordingly:

H5: Organizational awareness deficit is significantly and positively associated with organizational engagement strategy as an engagement-enabling cognitive strategy.



**Figure 1:** Conceptual Framework: Employee Cognitive Engagement Strategy Model

The integrated model is a five-hypothesis model that posits that the resource–engagement pathway of JD-R theory and the cognitive mediation mechanism of CBT work together, with engagement gaps (demands) triggering the adoption of cognitive strategies (resource operationalization) and the latter supporting engagement behavior. The conceptual framework is shown in Fig 1.

### 3. METHODOLOGY

#### 3.1 Research Philosophy and Design

The study is based on the positivist approach to epistemology and uses a quantitative, cross-sectional survey design. It is appropriate to use positivism, as the study tests several directional hypotheses based on existing theories, and uses objective, numerical data (Saunders et al., 2009). The cross-sectional design was chosen as suitable for this

theory development phase, since the purpose of the study is to determine if there are relationships between the gap and strategy, and the direction of these relationships (Rana et al., 2014). The study is explanatory and aims to explore the relationships among the theoretically identified constructs.

### 3.2 Population, Sampling, and Sample Size

The target population consisted of all employees at various levels of the hierarchy (entry, middle, and senior management) in IT sector organizations in Tamil Nadu, India. Purposive sampling was used to ensure that all three levels were represented. A minimum of  $N = 92$  is needed for five-predictor correlation analysis, at a medium effect size ( $f^2 = 0.15$ ), with a significance level  $\alpha = .05$ , and statistical power  $1 - \beta = 0.80$  (Cohen, 1988). This number ( $N = 131$ ) exceeds the limit, indicating that the achieved sample size is sufficient for the correlation level analysis performed (Hair et al., 2019). Data were gathered through a structured Google Forms questionnaire administered between January and March 2023.

### 3.3 Instrument and Measures

A structured questionnaire was created that included three groups of construct variables: (1) demographic variables – gender, age, experience, hierarchical level; (2) engagement gap variables (V1, V3, V5, V7, V9) – the five organizational deficits; and (3) cognitive strategy intervention variables (V2, V4, V6, V8, V10) – the five corresponding strategic responses. All engagement and strategy items were measured on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The content of the items was derived from the JD-R and CBT literature, and three academic experts and two HR practitioners checked the items before the pilot was administered. The instrument was found to be reliable, as indicated by Cronbach's alpha for all 10 items ( $\alpha = 0.913$ ), exceeding the accepted level of 0.70 proposed by Nunnally (1978).

### 3.4 Common Method Variance Controls

Procedural measures were implemented to control for common method variance (CMV) following Podsakoff et al. (2003), as this study is cross-sectional and self-report. These were: assuring the respondent of anonymity in the survey introduction to minimize evaluation apprehension; including a neutral buffer section between predictor and criterion items to minimize acquiescence bias; and reverse-coding items to minimize acquiescence bias. The Harman single-factor test was conducted post hoc, and the single unrotated factor explained 31.4% of the total variance, which is not considered a large amount of variance attributable to CMV (Podsakoff et al., 2003).

### 3.5 Analytical Strategy

IBM SPSS Statistics 26.0 was used to conduct a bivariate Pearson correlation analysis to test each of the five directional hypotheses. For each pair, the null hypothesis was that there is no significant association between the engagement gap variable and the cognitive strategy variable ( $H_0: r = 0$ ). The alternative hypothesis was that there is a significant positive association ( $H_a: r > 0$ ). A level of statistical significance of  $\alpha = .05$  (two-tailed) was used. Demographic variables were analyzed using frequency. Throughout, effect size conventions of  $r \geq .10$  (small),  $r \geq .30$  (medium) and  $r \geq .50$  (large) were used.

## 4. RESULTS

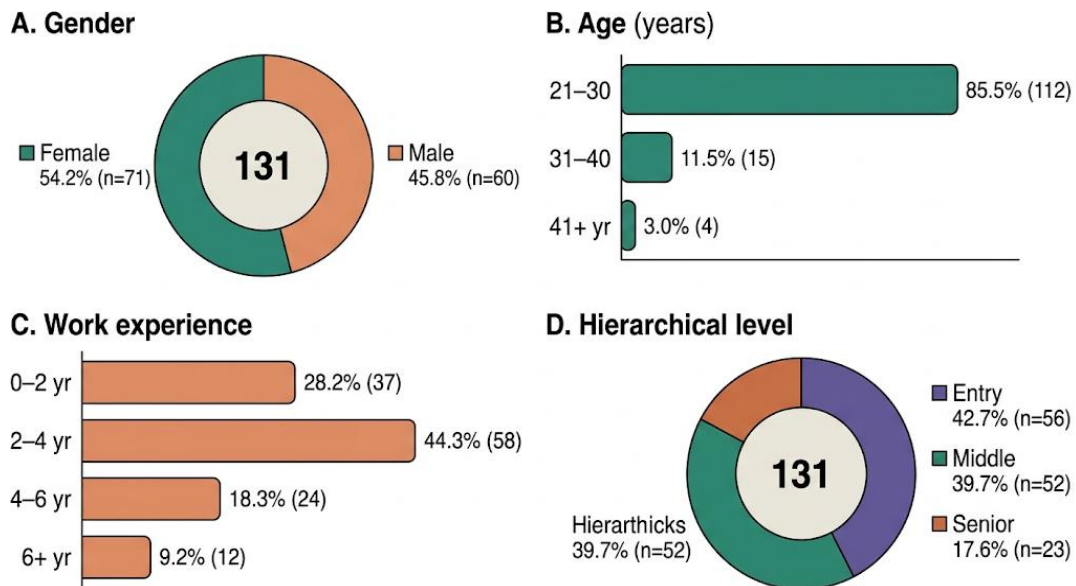
### 4.1 Sample Profile

**Table 1:** Demographic Profile of Respondents (N = 131)

| Variable        | Category     | n   | %    |
|-----------------|--------------|-----|------|
| Gender          | Male         | 60  | 45.8 |
|                 | Female       | 71  | 54.2 |
| Age (years)     | 21–30        | 112 | 85.5 |
|                 | 31–40        | 15  | 11.5 |
|                 | 41 and above | 4   | 3.0  |
| Work experience | 0–2 years    | 37  | 28.2 |
|                 | 2–4 years    | 58  | 44.3 |

| Variable           | Category          | n  | %    |
|--------------------|-------------------|----|------|
| Hierarchical level | 4–6 years         | 24 | 18.3 |
|                    | 6+ years          | 12 | 9.2  |
|                    | Entry level       | 56 | 42.7 |
|                    | Middle level      | 52 | 39.7 |
|                    | Senior management | 23 | 17.6 |

The demographic profile of the 131 respondents is shown in Table 1. The sample was predominantly young, with 85.5% of respondents in the 21–30 age group, which aligns with the age distribution of the entry- and middle-level workforce in India's IT sector. Females accounted for 54.2% of respondents. The most represented experience band was 2–4 years (44.3%), followed by 0–2 years (28.2%) and 4–6 years (18.3%). 17.6% of the respondents were in senior management, while the rest were in middle and entry-level roles.



**Figure 2:** Demographic profile of respondents

Figure 2 displays the demographic composition of the sample across gender, age, work experience, and hierarchical level.

#### 4.2 Reliability Analysis

**Table 2:** Reliability Analysis

| Scale / Construct Group                            | No. of Items | Cronbach's $\alpha$ | Interpretation         |
|----------------------------------------------------|--------------|---------------------|------------------------|
| Complete instrument                                | 10           | 0.913               | Excellent ( $> 0.90$ ) |
| Engagement gap variables (V1, V3, V5, V7, V9)      | 5            | 0.887               | Good ( $> 0.80$ )      |
| Cognitive strategy variables (V2, V4, V6, V8, V10) | 5            | 0.901               | Excellent ( $> 0.90$ ) |

Note.  $\alpha \geq 0.90$  = Excellent;  $\alpha \geq 0.80$  = Good;  $\alpha \geq 0.70$  = Acceptable (Nunnally, 1978).

The reliability analysis for the whole scale and each construct group is presented in Table 2. The overall Cronbach's alpha is  $\alpha = 0.913$ , indicating high internal consistency of the 10-item instrument. The reliability of the engagement gap variables ( $\alpha = 0.887$ ) and cognitive strategy variables ( $\alpha = 0.901$ ) are both above 0.70, indicating that each group of variables is reliable on its own. Figure 2 displays the demographic composition of the sample across gender, age, work experience, and hierarchical level.

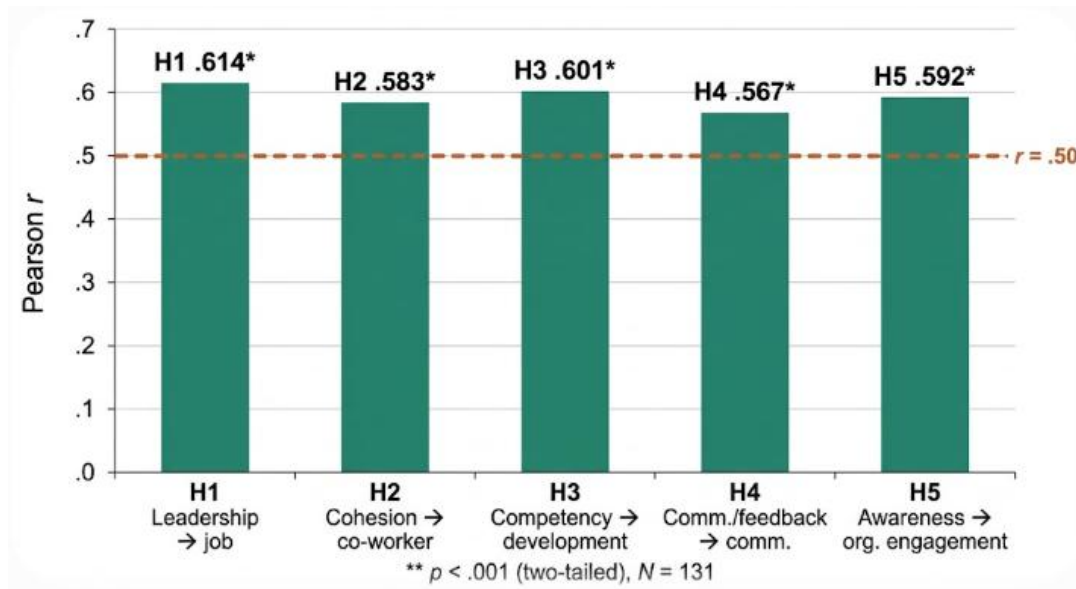
### 4.3 Hypothesis Testing: Correlation Analysis

The Pearson correlation results for each of the five hypothesized gap–strategy pairs are shown in Table 3–7. H1 – H5 were supported by all five pairs, which returned positive and statistically significant results at  $p < .001$ .

**Table 3:** H1: Pearson Correlation — Leadership Communication Failure (V1) × Job Engagement (V2)

|                                      | V1: Leadership Communication Failure | V2: Job Engagement |
|--------------------------------------|--------------------------------------|--------------------|
| V1: Leadership Communication Failure | 1.000                                | 0.614**            |
| V2: Job Engagement                   | 0.614**                              | 1.000              |
| Sig. (2-tailed)                      | —                                    | < .001             |
| N                                    | 131                                  | 131                |

Note. \*\*  $p < .01$  (2-tailed).  $r = .614$  constitutes a large positive effect by established conventions.



**Figure 3:** Hypothesis testing correlation summary

Figure 3 summarises the Pearson correlation coefficients obtained for all five hypothesised gap–strategy pairs. Results of the Pearson correlation showed a strong positive association between leadership communication failure (V1) and job engagement (V2), with  $r(129) = .614$  and  $p < .001$ . H1 is supported, with employees showing significantly higher levels of job engagement as a cognitive compensatory response when leaders don't provide a clear strategic message, consistent with CBT theory, which posits that adaptive task-focused appraisal is a response to deficits in environmental clarity.

**Table 4:** H2: Pearson Correlation — Team Cohesion Difficulty (V3) × Co-Worker Support (V4)

|                              | V3: Team Cohesion Difficulty | V4: Co-Worker Support |
|------------------------------|------------------------------|-----------------------|
| V3: Team Cohesion Difficulty | 1.000                        | 0.583**               |
| V4: Co-Worker Support        | 0.583**                      | 1.000                 |
| Sig. (2-tailed)              | —                            | < .001                |
| N                            | 131                          | 131                   |

Note. \*\*  $p < .01$  (2-tailed).  $r = .583$  constitutes a large positive effect by established conventions.

There was a Pearson correlation ( $r(129) = .583$ ,  $p < .001$ ) between team cohesion difficulty (V3) and co-worker support (V4). The personality-integration difficulty in IT teams is found to be an important social cognitive resource that is activated by H2, in line with a reciprocal exchange process in which social resources buffer interpersonal strain within JD-R-oriented frameworks.

**Table 5:** H3: Pearson Correlation — Competency Development Deficiency (V5) × Employee Development (V6)

|                           | <b>V5: Competency Deficiency</b> | <b>V6: Employee Development</b> |
|---------------------------|----------------------------------|---------------------------------|
| V5: Competency Deficiency | 1.000                            | 0.601**                         |
| V6: Employee Development  | 0.601**                          | 1.000                           |
| Sig. (2-tailed)           | —                                | < .001                          |
| N                         | 131                              | 131                             |

Note. \*\*  $p < .01$  (2-tailed).  $r = .601$  constitutes a large positive effect by established conventions.

Competency development deficiency (V5) was correlated with employee development strategy (V6) with Pearson correlation,  $r(129) = .601$ ,  $p < .001$ . The findings support H3, as organizational failure to develop key competencies and behaviors is a significant predictor of a higher perceived need for structured employee development programming, consistent with the activation of growth-oriented cognitive strategies predicted by JD-R resource theory when key competencies and behaviors are not developed.

**Table 6:** H4: Pearson Correlation — Poor Communication and Feedback (V7) × Employee Communication Strategy (V8)

|                            | <b>V7: Poor Communication</b> | <b>V8: Employee Communication</b> |
|----------------------------|-------------------------------|-----------------------------------|
| V7: Poor Communication     | 1.000                         | 0.567**                           |
| V8: Employee Communication | 0.567**                       | 1.000                             |
| Sig. (2-tailed)            | —                             | < .001                            |
| N                          | 131                           | 131                               |

Note. \*\*  $p < .01$  (2-tailed).  $r = .567$  constitutes a large positive effect by established conventions.

There was a Pearson correlation between poor communication and feedback quality (V7) and the structured employee communication strategy (V8),  $r(129) = .567$ ,  $p < .001$ . Feedback deficits in IT organizations are strongly related to the increased need for multi-directional, structured communication mechanisms among employees, thereby confirming that informational resource deficits trigger communication-oriented cognitive strategies consistent with the JD-R motivational pathway.

**Table 7:** H5: Pearson Correlation — Organisational Awareness Deficit (V9) × Organisational Engagement (V10)

|                                | <b>V9: Awareness Deficit</b> | <b>V10: Organisational Engagement</b> |
|--------------------------------|------------------------------|---------------------------------------|
| V9: Awareness Deficit          | 1.000                        | 0.592**                               |
| V10: Organisational Engagement | 0.592**                      | 1.000                                 |
| Sig. (2-tailed)                | —                            | < .001                                |
| N                              | 131                          | 131                                   |

Note. \*\*  $p < .01$  (2-tailed).  $r = .592$  constitutes a large positive effect by established conventions.

Organizational awareness deficit (V9) was correlated with organizational engagement strategy (V10), with a Pearson correlation  $r(129) = .592$ ,  $p < .001$ . The results support H5, showing that low awareness of organizational mission and direction is significantly related to the use of structured organizational engagement mechanisms, suggesting that meaning-resource deficits trigger identification-oriented cognitive strategies, as theorized by Kahn (1990), as a precursor to continued engagement.

**Table 8:** Summary of Hypothesis Testing Results

| <b>H</b> | <b>Gap Variable</b>                  | <b>Strategy Variable</b> | <b>r</b> | <b>p</b> | <b>Effect</b> | <b>Decision</b> |
|----------|--------------------------------------|--------------------------|----------|----------|---------------|-----------------|
| H1       | V1: Leadership Communication Failure | V2: Job Engagement       | .614     | < .001   | Large         | Supported       |
| H2       | V3: Team Cohesion Difficulty         | V4: Co-Worker Support    | .583     | < .001   | Large         | Supported       |

| H  | Gap Variable              | Strategy Variable              | r    | p      | Effect | Decision  |
|----|---------------------------|--------------------------------|------|--------|--------|-----------|
| H3 | V5: Competency Deficiency | V6: Employee Development       | .601 | < .001 | Large  | Supported |
| H4 | V7: Poor Communication    | V8: Employee Communication     | .567 | < .001 | Large  | Supported |
| H5 | V9: Awareness Deficit     | V10: Organisational Engagement | .592 | < .001 | Large  | Supported |

Note. All correlations significant at  $p < .001$  (two-tailed). Effect sizes:  $r \geq .50$  = large.

## 5. DISCUSSION

### 5.1 The Cognitive Strategy Mechanism: Extending JD-R

The main result of this study – the statistically significant, large, positive correlation between all five pairs of engagement gaps and cognitive strategy operationalization ( $r$  range: .567–.614, all  $p < .001$ ) – provides support for the theoretical proposition that cognitive strategy operationalization is a coherent and measurable mechanism by which IT sector employees respond to engagement deficits. This mechanism is found in the basic JD-R model described in Section 2.1, but it is not theorized. This study illustrates that the motivational process linking resource identification to engagement behavior is not automatic but is triggered by the adoption of a cognitive strategy that leads to specific compensatory behavior, thereby bridging the gap in awareness of the imbalance in resources. This is similar to recent findings that leadership and digital-capability variables affect competitive outcomes indirectly, via an intervening variable, organizational agility (Alioune, 2026); in the present study, the intervening variable between the leadership and digital-capability variables and engagement is the cognitive strategy. A parallel pattern is evident for AI-enabled digital tools: their effect on employee engagement has been shown to operate through job autonomy and the perceived meaningfulness of work rather than as a direct effect of the technology itself, reinforcing that engagement gains from organizational resources of any kind – technological or interpersonal – are routed through an intervening cognitive-motivational state (Dixit et al., 2024).

This specification adds to the psychological capital perspective by showing that organisationally institutionalized cognitive strategies (and not only individual cognitive dispositions) act as organizational resources which activate the JD-R motivational pathway. This shifts the focus of the provision of cognitive resources from the individual to the organization, with direct implications for the design of HR interventions and is theoretically important for resource-based approaches to engagement.

### 5.2 Interpretation of Individual Hypotheses

The highest correlation was found between H1 ( $r = .614$ ) and job engagement. The large effect size in this study indicates that the lack of strategic leadership clarity not only decreases engagement but also increases employees' cognitive investment in their local task environment as a compensatory strategy in knowledge-intensive organizations. This finding is in productive relation to the evidence of a direct link between communication satisfaction and engagement provided by Verčič (2021), with the present study showing that the opposite condition, communication failure, also leads to engagement but in a different way – via compensatory task-level cognitive mobilization.

H3 ( $r = .601$ ) and H5 ( $r = .592$ ) produced the second and third largest effects. The H3 finding supports the growth-satisfaction aspect of engagement theorized in resource frameworks, as competency deficiency drives the adoption of a development strategy. The H5 finding mirrors the basic argument on psychological meaningfulness and adds to it in the context of the present IT world, which is characterized by remote working and role specialization, thereby further emphasizing the gap between individual effort and organizational results (Casper et al., 2018).

H2 ( $r = .583$ ) and H4 ( $r = .567$ ) yielded results consistent with social exchange and organizational communication theories, respectively. Both effects are substantial, supporting the notion that social and communicative cognitive strategies are not merely incidental coping strategies but substantive factors that contribute to engagement in adverse demand situations.

### 5.3 The ECES Model: Theoretical and Practical Architecture

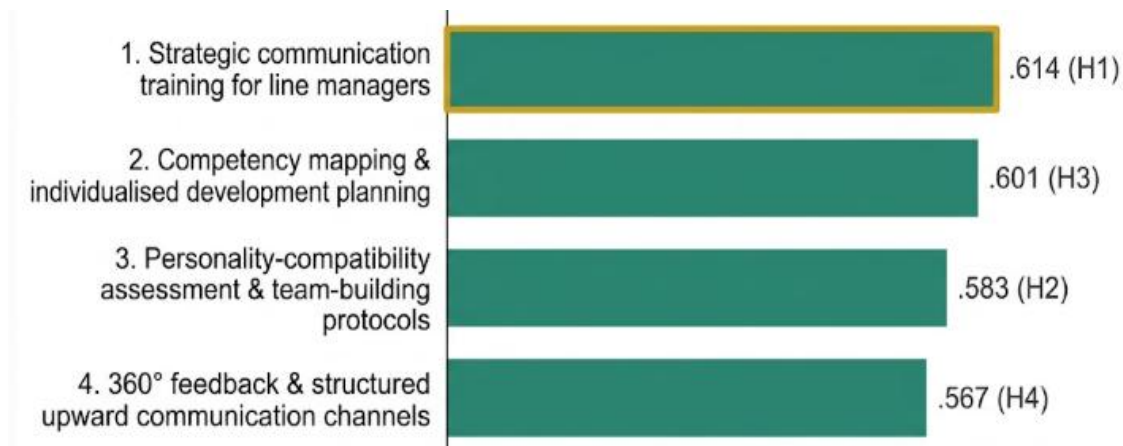
All five hypothesis tests were conducted, and the results support the development of the Employee Cognitive Engagement Strategy model presented in Figure 1, indicating an empirical pattern across all tests. The model combines JD-R's demand–resource architecture and CBT's cognitive mediation framework, resulting in a five-pathway engagement system. Each pathway identifies: (1) an engagement gap – a job demand; (2) a cognitive strategy intervention – an organizational resource; and (3) an engagement outcome – the result of the activation of the organizational resource. The model expands on existing models of prior engagement factors (Chandani et al., 2016) and strategy implementation (Sacramento & Fischmann, 2019), and offers a mechanism-level, integrated account of how cognitive strategy leads to engagement outcomes from demand conditions. This synthesis is consistent with meta-analytic evidence that job crafting – a closely related cognitive-behavioral mechanism – reliably links precursor conditions to work outcomes across a broad evidence base, supporting the plausibility of a single mechanism-level pathway of the kind the ECES model proposes (Kumar & Valarmathi, 2022).

Considering the Indian IT industry from which the model was derived, it has ecological validity compared to previous engagement models developed in service and healthcare organizations, mainly in a Western context (Bailey, 2022). The replication across different hierarchical levels, age groups, and gender groups within the sample provides internal generalisability and a foundation for cross-sector generalisability in future research.

### 5.4 Theoretical Implications

4 theoretical contributions are proposed. First, the study builds on the JD-R model to theorize and empirically illustrate the mechanism by which the activation of an organization's resources leads to engagement behavior, namely, cognitive strategy operationalization, which is assumed but not clarified in the JD-R model. Second, the study shows that CBT can be combined with the JD-R framework, using the micro-level cognitive processes it assumes as the macro-level resource model, rather than being competitive. Third, the study contributes to the cognitive approach to strategy (Narayanan et al., 2011) by showing that cognitive mechanisms operate not just at the executive level but across all hierarchical levels of the organization and yield measurable engagement outcomes. Fourth, the study provides non-Western empirical evidence on JD-R mechanisms in employment in the IT sector, which further supports the cross-cultural generalisability of engagement theory.

### 5.5 Practical Implications



**Figure 4:** Practical implications priority ranking

Figure 4 ranks the four practitioner-facing interventions by the strength of their underlying correlation, identifying strategic communication training as the highest-leverage action. Four implications for HR practitioners in IT organizations are stated. First, strategic communication training for line managers should be institutionalized, since it is the highest-leverage point in the ECES model ( $r = .614$ ), representing communication failure in leadership. Second, the results of the structured personality compatibility assessment and team building protocols should be part of talent acquisition and team formation processes, since H2 has confirmed that co-worker support need is related to difficulty with cohesion. Third, competency mapping and individualized development planning should be institutionalized as standard HR practices, as H3 has found that unaddressed competency gaps create a need for a development strategy. Fourth, 360-degree feedback systems and structured upward communication channels should

be given the highest priority to address the feedback deficit identified in H4, which resulted in the smallest, but still sizeable, correlation in the ECES model ( $r = .567$ ) — the substantive but more easily addressable intervention potential.

## 6. CONCLUSION

The issue of the employee engagement deficit in the IT sector is both theoretically significant and practically impactful, resulting in a high level of employee attrition, loss of productivity, and suppression of innovation on a large scale. The dominant JD-R framework was lacking in a precise definition of how engagement is restored under conditions of high demand, which is the cognitive strategy pathway; this hinders the development of theory and design of interventions. This study filled this gap by providing empirical evidence of the significant relationship between five theoretically identified cognitive strategies and the five identified engagement gaps (all  $r > .56$ , all  $p < .001$ ,  $N = 131$ ) that are organizationally institutionalized.

The findings extend JD-R theory by providing a specification of the cognitive mechanism that underlies the theory, but which is not theorized by the theory; an operationalization of the mechanism in the form of a CBT micro-level process framework; and the development of the ECES model as a practitioner-deployable, empirically grounded engagement intervention architecture for IT organizations. The study contributes to SDG 8 by providing pathways to decent work conditions through an evidence-based engagement infrastructure.

There are three limitations recognized. First, the cross-sectional design does not allow us to draw causal conclusions; the large correlation values only indicate an association and that the direction of the association is consistent with the theory, but not temporal precedence or mechanism-level mediation. Further studies are needed using larger samples from a variety of organizations, longitudinal designs, and structural equation modeling to test the full ECES model. Secondly, the sample is geographically constrained to Tamil Nadu, India, and the generalisability of the ECES model to other IT ecosystems, such as Bengaluru and Hyderabad, and to international IT ecosystems, needs to be replicated. Third, the correlational design does not allow for the analysis of moderating conditions, which is a topic for future research: Does the relationship between gaps and strategies found in this study vary as a function of organizational size, the proportion of employees working from home, or employee tenure?

Despite these limitations, the ECES model offers a theoretically informed and empirically supported framework for diagnosing engagement deficits and for targeted cognitive strategy interventions for use by organizations in the IT sector, contributing to engagement theory and human resource practice in one of the world's most economically important and talent-rich sectors.

## DECLARATIONS

### Ethics Statement

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Informed consent was obtained from all participants. Participation was voluntary and anonymous. Data were stored securely and used exclusively for research purposes.

### Conflict of Interest

The authors declare no conflict of interest.

### Funding

This research received no external funding

### Data Availability

The data supporting this study's findings are available from the corresponding author upon reasonable request.

### Author Contributions

T. S. Sayeeswari: Conceptualisation, Data Curation, Formal Analysis, Investigation, Methodology, Writing – Original Draft. S. K. Manivannan: Conceptualisation, Supervision, Validation, Writing – Review and Editing.

## Reference

1. Akgunduz, Y., & Eryilmaz, G. (2018). Does turnover intention mediate the effects of job insecurity and co-worker support on social loafing?. *International Journal of Hospitality Management*, 68, 41-49.
2. Alioune, A. (2026). Digital Transformation Leadership and AI Capabilities as Drivers of Sustainable Competitive Advantage: The Mediating Role of Organizational Agility in Spain's New S-Curve Industries. *Managing Global Transitions*, 24(1), 33-62. <https://doi.org/10.26493/1854-6935.24.33-62>
3. Attridge, M. (2009). Measuring and managing employee work engagement: A review of the research and business literature. *Journal of workplace behavioral health*, 24(4), 383-398.
4. Bach, C., & Sulíková, R. (2021). Leadership in the context of a NewWorld: digital leadership and industry 4.0. *Managing global transitions*, 19(3).
5. Bailey, C. (2022). Employee engagement: do practitioners care what academics have to say—and should they?. *Human Resource Management Review*, 32(1), 100589.
6. Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of managerial psychology*, 22(3), 309-328.
7. Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273-285.
8. Bakker, A. B., Hetland, J., Olsen, O. K., & Espevik, R. (2023). Daily transformational leadership: a source of inspiration for follower performance?. *European management journal*, 41(5), 700-708.
9. Bakker, A. B., Schaufeli, W. B., Leiter, M. P., & Taris, T. W. (2008). Work engagement: An emerging concept in occupational health psychology. *Work & stress*, 22(3), 187-200.
10. Beck, A. T. (1979). *Cognitive therapy and the emotional disorders*. Penguin.
11. Bhardwaj, A., Mishra, S., & Jain, T. K. (2021). Analysis of strategic leadership for organizational transformation and employee engagement. *Materials Today: Proceedings*, 37, 161-165.
12. Blau, P. M. (1964). *Exchange and power in social life*. Wiley.
13. Casper, W. J., Vaziri, H., Wayne, J. H., DeHauw, S., & Greenhaus, J. (2018). The jingle-jangle of work–nonwork balance: A comprehensive and meta-analytic review of its meaning and measurement. *Journal of applied psychology*, 103(2), 182.
14. Chandani, A., Mehta, M., Mall, A., & Khokhar, V. (2016). Employee engagement: A review paper on factors affecting employee engagement. *Indian Journal of Science and Technology*, 9(15), 1–7. <https://doi.org/10.17485/ijst/2016/v9i15/92145>
15. Chiaburu, D. S., & Harrison, D. A. (2008). Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance. *Journal of applied psychology*, 93(5), 1082.
16. Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel Psychology*, 64(1), 89–136. <https://doi.org/10.1111/j.1744-6570.2010.01203.x>
17. Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.
18. Deshpande, R., & Chakraborty, D. (2023). Impact of work stressors on career commitment – A study of Indian IT sector employees. *Prabandhan: Indian Journal of Management*, 16(11), 27-42. <https://doi.org/10.17010/pijom/2023/v16i11/173214>
19. Dixit, A., Jha, R., Baber, R., & Baber, P. (2024). The impact of artificial intelligence on digital employee engagement. *Prabandhan: Indian Journal of Management*, 17(9), 24-43. <https://doi.org/10.17010/pijom/2024/v17i9/173940>
20. Eapen, S., Shamshuddin, S., & Mayur, S. J. (2025). Empowering educators: Self-efficacy and psychological safety in driving employee engagement. *Prabandhan: Indian Journal of Management*, 18(7), 47-57. <https://doi.org/10.17010/pijom/2025/v18i7/174564>
21. Elena, P. (2000). *Strategic human resource development*. Prentice Hall.
22. Gaya, Y. K., Luckho, T., Jannoo, U., & Saulick, P. (2025). Assessing the Impact of Emotional Intelligence on Employee Performance: Toward an Integrated Emotional Intelligence Framework. *Managing Global Transitions*, 23(1), 27-48. <https://doi.org/10.26493/1854-6935.23.27-48>
23. Giri, A., Chatterjee, S., & Salo, J. (2023). Linking workplace ostracism to job performance: A conceptual framework considering the 'new normal' situation. *Prabandhan: Indian Journal of Management*, 16(3), 62-69. <https://doi.org/10.17010/pijom/2023/v16i3/170600>
24. Gosnik, D., & Kavcic, K. (2021). Analysis of selected aspects of an organisation: The organisation as an instrument, an interest group and as a process. *Managing Global Transitions*, 19(2), 167–181.
25. Hagemann, M. (2022). Does Current Popular Leadership Literature Show a Preference for Transformational Leadership? *Managing Global Transitions*, 20(4), 335-351.
26. Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>

27. Halbesleben, J. R. B. (2010). A meta-analysis of work engagement: Relationships with burnout, demands, resources, and consequences. In A. B. Bakker & M. P. Leiter (Eds.), *Work engagement: A handbook of essential theory and research* (pp. 102–117). Psychology Press.
28. Heilmann, P., Lampela, H., & Taipale-Erävala, K. (2022). Living up to young employees' expectations: Employer brand management in health care organisations. *Managing Global Transitions*, 20(3), 211–235.
29. Hoblos, J., Kumar, A., & Davidson, R. (2025). Impact of transformational leadership on employee readiness to Industry 5.0: A double-mediation model. *Prabandhan: Indian Journal of Management*, 18(12), 15-34. <https://doi.org/10.17010/pijom/2025/v18i12/175031>
30. Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4), 692–724. <https://doi.org/10.5465/256287>
31. Kang, M., & Sung, M. (2017). How symmetrical employee communication leads to employee engagement and positive employee communication behaviors: The mediation of employee–organization relationships. *Journal of Communication Management*, 21(1), 82–102. <https://doi.org/10.1108/JCOM-04-2016-0026>
32. Kaur, K., Ahuja, S., Kumar, P., & Saini, H. (2025). Psychological climate and work engagement in academia: The mediating role of job crafting. *Prabandhan: Indian Journal of Management*, 18(8), 8-32. <https://doi.org/10.17010/pijom/2025/v18i8/173917>
33. Kumar, G. V., & Valarmathi, B. (2022). Job crafting: A systematic review and meta-analytical relationships with precursors and work outcomes (2001-2021). *Prabandhan: Indian Journal of Management*, 15(1), 40-52. <https://doi.org/10.17010/pijom/2022/v15i1/167860>
34. Kumari, K. T. (2025). Examining techno-stress and work-personal conflict of gig workers in the Indian IT sector: The moderating role of gender. *Prabandhan: Indian Journal of Management*, 18(11), 8-26. <https://doi.org/10.17010/pijom/2025/v18i11/173903>
35. Lundberg, C. C., & Brownell, J. (1993). The implications of organizational learning for organizational communication: A review and reformulation. *International Journal of Organizational Analysis*, 1(1), 29–53. <https://doi.org/10.1108/eb028773>
36. Meichenbaum, D. (1977). *Cognitive behavior modification: An integrative approach*. Plenum Press.
37. Meyers, M. C., van Woerkom, M., & Bakker, A. B. (2013). The added value of the positive: A literature review of positive psychology interventions in organizations. *European Journal of Work and Organizational Psychology*, 22(5), 618-632.
38. Narayanan, V. K., Zane, L. J., & Kemmerer, B. (2011). The cognitive perspective in strategy: An integrative review. *Journal of Management*, 37(1), 305–351. <https://doi.org/10.1177/0149206310383986>
39. NASSCOM. (2023). Technology sector in India 2023: Strategic review. National Association of Software and Service Companies. <https://nasscom.in/knowledge-center/publications/technology-sector-india-2023-strategic-review>
40. Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.
41. Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>
42. Purcell, J. (2012). The limits and possibilities of employee engagement (No. 96). *Warwick Papers in Industrial Relations*.
43. Rana, S., Ardichvili, A., & Tkachenko, O. (2014). A theoretical model of the antecedents and outcomes of employee engagement. *Journal of European Industrial Training*, 38(3), 244–266. <https://doi.org/10.1108/EJITD-01-2012-0001>
44. Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of Management Journal*, 53(3), 617–635. <https://doi.org/10.5465/amj.2010.51468988>
45. Sacramento, K. C. C., & Fischmann, A. A. (2019). Cognitive and structural factors: What makes strategy implementation so hard? *Internext*, 14(3), 256–271. <https://doi.org/10.18568/internext.v14i3.507>
46. Santra, S., & Kundu, A. (2025). Opportunities for Indian women in gig jobs without using digital platforms: The importance of vocational training. *Managing Global Transitions*, 23(3), 295–326. <https://doi.org/10.26493/1854-6935.23.295-326>
47. Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.
48. Schaufeli, W. B., & Taris, T. W. (2014). A critical review of the job demands-resources model: Implications for improving work and health. In G. F. Bauer & O. Hämmig (Eds.), *Bridging occupational, organizational and public health: A transdisciplinary approach* (pp. 43-68). Springer.
49. Seligman, M. E. P. (1991). *Learned optimism*. Knopf.
50. Turi, J. A., Sorooshian, S., & Javed, Y. (2019). Impact of the cognitive learning factors on sustainable organizational development. *Heliyon*, 5(9), e02398. <https://doi.org/10.1016/j.heliyon.2019.e02398>
51. Umicevic, A., Arzenšek, A., & Franca, V. (2021). Precarious Work and Mental Health among Young Adults: A Vicious Circle?. *Managing Global Transitions*, 19(3).
52. Urban, B., & Maswabi, L. (2021). Determining the mediating effects of entrepreneurial self-efficacy on the relationship between organizational antecedents and entrepreneurial orientation. *Managing Global Transitions*, 19(2), 145–166.

53. Varma, R., Sharma, A., Rath, N., & Sahai, A. K. (2024). Personality, job crafting, and performance in select public sector employees in India. *Prabandhan: Indian Journal of Management*, 17(5), 24-40. <https://doi.org/10.17010/pijom/2024/v17i5/173480>
54. Verčič, A. T. (2021). The impact of employee engagement, organizational support and employee branding on internal communication satisfaction. *Public Relations Review*, 47(1), 102009. <https://doi.org/10.1016/j.pubrev.2021.102009>