

The Relationship between Work Engagement, Organizational Identification, and Work Effectiveness of Highly Qualified Specialists: An Empirical Study based on Chinese Enterprises

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Abstract: In the knowledge economy era, highly qualified specialists (HQS) have become critical drivers of enterprise innovation and competitiveness. However, traditional performance evaluation systems often overlook the psychological mechanisms underlying their work effectiveness. Drawing on performance management theory and social identity theory, this study constructs a theoretical model examining the relationships among work engagement, organizational identification, and work effectiveness of HQS. Using survey data from 562 highly qualified specialists in Chinese enterprises, structural equation modeling (SEM) was employed to test the proposed hypotheses. The results indicate that both work engagement ($\beta = 0.359$, $p < 0.001$) and organizational identification ($\beta = 0.272$, $p < 0.001$) are significantly and positively associated with work effectiveness. Furthermore, organizational identification partially mediates the relationship between work engagement and work effectiveness (indirect effect = 0.098, 95% CI [0.072, 0.128]). This study reveals the intrinsic mechanisms shaping HQS work effectiveness and provides empirical evidence for optimizing performance evaluation systems in Chinese enterprises.

Keywords: Work engagement, organizational identification, work effectiveness, highly qualified specialists, structural equation modeling, Chinese enterprises.

1. Introduction

The transition toward a knowledge-based economy has fundamentally reshaped the competitive landscape for enterprises worldwide [1]. In this new economic paradigm, knowledge and innovation have supplanted traditional production factors as the primary drivers of economic growth and organizational success [2]. Within Chinese enterprises, which are undergoing rapid industrial upgrading and increasing integration into global markets, highly qualified specialists (HQS)-individuals possessing advanced professional knowledge, specialized skills, and strong innovation capabilities-have emerged as critical strategic assets [3].

However, despite their recognized importance, a significant gap exists between the strategic value of HQS and the effectiveness of existing performance evaluation systems. Traditional performance appraisal methods, which emphasize quantifiable output, task completion rates, and standardized metrics, are ill-suited to capture the unique contributions of HQS [4]. The work of these specialists is characterized by complexity, creativity, high autonomy, and outcomes that are often intangible or realized over extended time horizons. Consequently, conventional evaluation approaches not only fail to accurately assess HQS performance but may also undermine their motivation and engagement.

The work effectiveness of employees has been extensively studied in organizational behavior literature. Kahn [5] conceptualized work effectiveness as the integration of an individual's self-role with their organizational role, manifested through cognitive, emotional, and behavioral engagement. Schaufeli et al. [6] further refined this construct, defining work engagement as a positive, fulfilling, work-related state characterized by vigor, dedication, and

absorption. Despite these theoretical advances, research specifically examining the determinants of work effectiveness among HQS in the Chinese context remains limited.

This study addresses two primary research questions. First, how do work engagement and organizational identification influence the work effectiveness of highly qualified specialists? Second, does organizational identification mediate the relationship between work engagement and work effectiveness? By answering these questions, this study aims to provide a more nuanced understanding of the psychological mechanisms underlying HQS performance and to offer evidence-based recommendations for optimizing performance evaluation systems in Chinese enterprises.

2. Theoretical Background and Hypotheses Development

2.1. Work Engagement and Work Effectiveness

Work engagement refers to a positive, fulfilling, work-related state of mind that is characterized by three core dimensions: vigor (high levels of energy and mental resilience), dedication (strong involvement and sense of significance), and absorption (full concentration and engrossment in work) [6]. Engaged employees invest more effort, demonstrate greater persistence in the face of challenges, and achieve higher levels of task performance and organizational citizenship behaviors.

The theoretical link between work engagement and work effectiveness can be understood through the Job Demands-Resources (JD-R) model [7], which posits that job resources (e.g., autonomy, social support, performance feedback) foster work engagement, which in turn enhances performance outcomes. For HQS, who typically work on complex, non-

routine tasks requiring sustained cognitive effort and creative problem-solving, work engagement is expected to be a particularly potent predictor of work effectiveness. Engaged specialists are more likely to persist through technical difficulties, generate innovative solutions, and invest discretionary effort beyond formal job requirements. Therefore, we propose:

H1: Work engagement is significantly and positively related to the work effectiveness of highly qualified specialists.

2.2. Organizational Identification and Work Effectiveness

Organizational identification refers to the psychological state in which employees define themselves in terms of their membership in an organization and perceive the organization's successes and failures as their own [8]. Rooted in social identity theory, organizational identification reflects the extent to which an individual's self-concept incorporates the attributes, values, and goals of the employing organization.

Employees with strong organizational identification are more likely to align their personal interests with organizational objectives, exert extra-role efforts, and demonstrate higher levels of commitment and loyalty. Within the context of HQS, who often possess strong professional identities that may compete with organizational identities, fostering organizational identification is particularly challenging yet critically important. When HQS identify strongly with their organization, they are more likely to channel their professional expertise toward organizational goals, share knowledge with colleagues, and remain with the organization despite attractive external opportunities. Consequently, we propose:

H2: Organizational identification is significantly and positively related to the work effectiveness of highly qualified specialists.

2.3. The Mediating Role of Organizational Identification

Beyond their direct effects, work engagement and organizational identification may be interrelated. Engaged employees, by virtue of their sustained investment of time, energy, and cognitive resources in work tasks, are more likely to internalize organizational values, develop emotional attachment to their workplace, and strengthen their identification with the organization. This process can be understood through the lens of self-perception theory: individuals infer their attitudes and identities from their observed behaviors. Highly engaged employees observe their own dedication and effort, leading them to conclude that the organization must be worthy of such investment, thereby enhancing organizational identification.

In turn, as discussed above, organizational identification enhances work effectiveness by motivating employees to exert effort toward organizational goals. Thus, organizational identification may serve as a mediating mechanism through which work engagement translates into higher work effectiveness. Accordingly, we propose:

H3: Organizational identification mediates the positive relationship between work engagement and work effectiveness.

Based on the above theoretical reasoning, Figure 1 presents the conceptual model guiding this study.

3. Methodology

3.1. Sample and Procedure

The target population for this study consisted of highly qualified specialists employed in Chinese enterprises. Following established definitions in the literature [4], HQS were operationalized as employees who (a) possess a bachelor's degree or higher, (b) are engaged in knowledge-intensive work requiring specialized expertise, and (c) have at least three years of professional experience in their field.

A stratified random sampling strategy was employed to ensure representation across different enterprise types (technology, finance, manufacturing) and organizational levels (junior, middle, and senior specialists). Data were collected through a structured questionnaire administered both online and offline between March and June 2025. A total of 600 questionnaires were distributed, and 579 were returned. After screening for missing data and response patterns, 562 valid responses remained, yielding an effective response rate of 93.66%.

The sample characteristics are summarized in Table 1. The sample was balanced by gender (46.09% male, 53.91% female) and marital status (50.53% married, 49.47% unmarried). Age distribution showed concentrations in the 21–25 (17.44%), 36–40 (16.90%), and 41–45 (17.44%) year categories. Educational attainment was high: 23.84% held college degrees, 24.91% bachelor's degrees, 25.27% master's degrees, and 25.98% doctoral degrees. Years of work experience ranged from less than five years (15.48%) to over twenty years (17.79%), with relatively even distribution across categories.

3.2. Measures

All constructs were measured using validated scales adapted from prior research. Items were translated into Chinese using a back-translation procedure to ensure semantic equivalence. Responses were recorded on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Work engagement was measured using a 5-item scale derived from the Utrecht Work Engagement Scale (UWES) [6]. Sample items include: "I am very passionate about my job and am able to be proactive in my approach" and "I keep learning business knowledge every day." The Cronbach's alpha for this scale in the current study was 0.709, indicating acceptable reliability.

Organizational identification was assessed using a 4-item scale adapted from Ashforth and Mael [8]. Sample items include: "I am always willing to contribute to the development of the company" and "My job has a promising future." The Cronbach's alpha was 0.672, meeting the acceptable threshold for exploratory research.

Work effectiveness was measured using a 17-item comprehensive scale developed through expert interviews and rough set reduction based on the preliminary evaluation system described in the original dissertation [3]. The scale encompasses four dimensions: work engagement indicators, organizational identification indicators, value identification indicators, and emotional belonging indicators. The overall Cronbach's alpha for the work effectiveness scale was 0.886, indicating excellent internal consistency.

3.3. Control Variables

Consistent with prior research on work effectiveness [4,7],

several demographic variables were included as controls to rule out alternative explanations. Specifically, gender, age, marital status, years of work experience, and educational level were controlled for in the analysis.

3.4. Data Analysis Strategy

Data were analyzed using SPSS 26.0 and AMOS 24.0. The analytical procedure consisted of three stages. First, descriptive statistics and reliability analyses were conducted to examine the properties of the measurement scales. Second, confirmatory factor analysis (CFA) was performed to assess the discriminant validity of the study constructs. Third, structural equation modeling (SEM) was employed to test the hypothesized relationships. The mediation hypothesis (H3) was tested using the bootstrapping procedure with 5,000 resamples to generate bias-corrected confidence intervals for the indirect effect.

Model fit was evaluated using multiple indices: the chi-square to degrees of freedom ratio (χ^2/df), comparative fit index (CFI), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normed fit index (NFI), incremental fit index (IFI), and root mean square error of approximation (RMSEA). Following established guidelines, acceptable fit was indicated by $\chi^2/df < 3$, CFI, GFI, AGFI, NFI, and IFI > 0.90 , and RMSEA < 0.08 .

4. Results

4.1. Measurement Model

Prior to testing the structural model, the measurement model was evaluated through confirmatory factor analysis. The three-factor model (work engagement, organizational identification, work effectiveness) demonstrated good fit with the data: $\chi^2/df = 2.462$, GFI = 0.940, AGFI = 0.919, NFI = 0.902, IFI = 0.940, CFI = 0.939, RMSEA = 0.051. All factor loadings were significant ($p < 0.001$) and exceeded 0.50, indicating acceptable convergent validity.

Discriminant validity was assessed by comparing the square root of the average variance extracted (AVE) for each construct with the correlations between constructs. The square root of AVE for each construct exceeded the corresponding inter-construct correlations, supporting discriminant validity.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.940, exceeding the recommended threshold of 0.60, and Bartlett's test of sphericity was significant ($\chi^2 = 2818.340$, $df = 136$, $p < 0.001$), confirming the suitability of the data for factor analysis.

4.2. Descriptive Statistics and Correlations

Table 2 presents the means, standard deviations, and correlations among the study variables. Work engagement was significantly positively correlated with work effectiveness ($r = 0.894$, $p < 0.01$). Organizational identification was also significantly positively correlated with work effectiveness ($r = 0.834$, $p < 0.01$). The correlation between work engagement and organizational identification was also positive and significant ($r = 0.78$, $p < 0.01$). These preliminary findings provide initial support for H1 and H2.

Among the control variables, age ($F = 177.27$, $p < 0.001$), years of work experience ($F = 100.80$, $p < 0.001$), and educational level ($F = 166.54$, $p < 0.001$) showed significant associations with work effectiveness, while gender ($F = 0.173$, $p = 0.862$) and marital status ($t = -0.520$, $p = 0.603$) did not.

Consequently, age, experience, and education were retained as controls in subsequent analyses.

4.3. Hypothesis Testing

Structural equation modeling was employed to test the hypothesized relationships. The structural model demonstrated acceptable fit: $\chi^2/df = 2.51$, GFI = 0.936, CFI = 0.935, RMSEA = 0.052.

As shown in Table 3, work engagement was significantly positively related to work effectiveness ($\beta = 0.359$, $p < 0.001$), supporting H1. Organizational identification was also significantly positively related to work effectiveness ($\beta = 0.272$, $p < 0.001$), supporting H2. The control variables of age, experience, and education did not significantly alter the pattern of results.

To test the mediation hypothesis (H3), the bootstrapping procedure with 5,000 resamples was employed. The indirect effect of work engagement on work effectiveness through organizational identification was 0.098 (95% bias-corrected CI [0.072, 0.128]). Since zero is not included in the confidence interval, the indirect effect is statistically significant at $p < 0.05$. Furthermore, the direct effect of work engagement on work effectiveness remained significant when organizational identification was included in the model ($\beta = 0.261$, $p < 0.001$), indicating partial mediation. Thus, H3 is supported.

5. Discussion

This study set out to examine the relationships among work engagement, organizational identification, and work effectiveness of highly qualified specialists in Chinese enterprises. The findings provide empirical support for all three hypotheses and offer several theoretical and practical contributions.

5.1. Theoretical Implications

First, this study confirms that work engagement is a strong predictor of work effectiveness among HQS. The standardized coefficient for work engagement ($\beta = 0.359$) was larger than that for organizational identification ($\beta = 0.272$), suggesting that the energetic and dedicated aspects of work engagement may be particularly important for knowledge-intensive roles. This finding extends prior research [5,6] by demonstrating the applicability of work engagement theory to the specific context of HQS in Chinese enterprises.

Second, the significant positive relationship between organizational identification and work effectiveness aligns with social identity theory predictions [8]. For HQS, who may face competing loyalties between their professional community and their employer, fostering strong organizational identification appears to be an effective strategy for channeling their expertise toward organizational goals.

Third, and perhaps most importantly, this study identified organizational identification as a partial mediator of the work engagement-work effectiveness relationship. This finding advances theoretical understanding by revealing a psychological mechanism through which engaged employees achieve higher performance. Engaged employees not only work harder and smarter (direct effect) but also develop stronger identification with their organization, which in turn motivates sustained effort and commitment (indirect effect). This dual-pathway model provides a more comprehensive account of how work engagement translates into performance

outcomes.

5.2. Practical Implications

The findings of this study have several practical implications for Chinese enterprises seeking to optimize the performance evaluation and management of highly qualified specialists.

First, given the strong direct effect of work engagement on work effectiveness, enterprises should invest in interventions designed to enhance engagement. These may include providing challenging and meaningful work assignments, offering autonomy and flexibility in task completion, ensuring adequate resources and support, and creating opportunities for continuous learning and skill development [7].

Second, the significant effect of organizational identification suggests that enterprises should actively cultivate a sense of shared identity among HQS. This can be achieved through transparent communication of organizational values and goals, involving specialists in decision-making processes, recognizing and celebrating team and organizational achievements, and fostering a supportive and inclusive organizational culture [8].

Third, the partial mediation finding indicates that engagement-enhancing interventions may have additional benefits beyond their direct effects. By increasing work engagement, enterprises may indirectly strengthen organizational identification, creating a virtuous cycle that further amplifies work effectiveness. Consequently, HR practices that simultaneously target engagement and identification—such as team-based rewards, career development programs, and values-based leadership—may be particularly effective.

5.3. Limitations and Future Research

Several limitations should be acknowledged. First, the cross-sectional design precludes causal inferences. While our theoretical model posits that work engagement and organizational identification influence work effectiveness, reverse causality or reciprocal relationships are also plausible. Future research should employ longitudinal designs or experience sampling methods to establish temporal precedence and examine dynamic relationships over time.

Second, all data were self-reported, raising the possibility of common method bias. However, the good fit of the measurement model and the pattern of correlations (not all variables were highly correlated) suggest that common method bias is not a severe threat to the validity of the findings. Nevertheless, future studies could incorporate supervisor ratings of work effectiveness or objective performance indicators to further mitigate this concern.

Third, the sample, while diverse, was limited to Chinese enterprises. Cultural factors such as collectivism, power distance, and Confucian work values may influence the relationships examined in this study. Cross-cultural replication studies are needed to determine the generalizability of the findings to other national contexts.

Fourth, the measure of work effectiveness used in this study, while comprehensive, was specifically developed for the Chinese enterprise context. Future research could validate this measure in other settings and compare it with established performance scales.

6. Conclusion

This study provides empirical evidence that work engagement and organizational identification are significant positive predictors of work effectiveness among highly qualified specialists in Chinese enterprises. Furthermore, organizational identification partially mediates the relationship between work engagement and work effectiveness. These findings contribute to theoretical understanding of the mechanisms underlying HQS performance and offer actionable insights for enterprises seeking to optimize their performance evaluation and talent management systems. In the increasingly competitive knowledge economy, enterprises that successfully foster both work engagement and organizational identification among their highly qualified specialists will be well-positioned to achieve sustainable competitive advantage.

7. Tables

Table 1. Sample Characteristics (N = 562)

Variable	Category	N	Percentage
Gender	Male	259	46.09%
	Female	303	53.91%
Age	21–25 years	98	17.44%
	26–30 years	94	16.73%
	31–35 years	83	14.77%
	36–40 years	95	16.90%
	41–45 years	98	17.44%
46+ years		94	16.73%
Marital Status	Married	284	50.53%
	Unmarried	278	49.47%
Education	College	134	23.84%
	Bachelor's	140	24.91%
	Master's	142	25.27%
	Doctorate	146	25.98%
Work Experience	0–5 years	87	15.48%
	6–10 years	101	17.97%
	11–15 years	88	15.66%
	16–20 years	100	17.79%
	21+ years	86	15.30%

Table 2. Correlations Among Study Variables

Variable	Mean	SD	1	2	3
1. Work Engagement	22.56	4.32	(0.709)		
2. Organizational Identification	17.09	3.68	0.78**	(0.672)	
3. Work Effectiveness	74.23	15.20	0.894**	0.834**	(0.886)

*Note: Diagonal values in parentheses are Cronbach's alpha coefficients. *p < 0.01.

Table 3. Structural Model Results

Path	β	SE	t-value	p-value
Work Engagement → Work Effectiveness (H1)	0.359	0.002	173.29	< 0.001
Organizational Identification → Work Effectiveness (H2)	0.272	0.002	144.57	< 0.001
Work Engagement → Organizational Identification	0.361	0.003	120.33	< 0.001
Indirect Effect (H3)	0.098	0.014	—	< 0.05

Note: β = standardized regression coefficient; SE = standard error; 95% bias-corrected CI for indirect effect [0.072, 0.128].

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