EXPLORING THE IMPACT OF PLATFORM LEADERSHIP ON INNOVATIVE BEHAVIOR: A SEQUENTIAL EXPLANATORY MIXED METHOD

1 Ying Li, 2 Muhammad Shahid Khan, 3 Valliappan Raju

1 Innovation Management College, Suan Sunandha Rajabhat University, Bangkok, Thailand, 10300
2 Innovation Management College, Suan Sunandha Rajabhat University, Bangkok, Thailand, 10300
E-Mail: shahid.kh@ssru.ac.th; 330799547@qq.com
3 Research Management Centre, Perdana University, Malaysia

Abstract.
Platform leadership is a new leadership model characterized by "empowerment," "growth," and equal sharing. As the Chinese economy transitions to innovation-driven high-quality development, the innovative capabilities of employees directly impact the long-term development of companies. It is worth further exploring how Platform leadership influences employee innovation behavior and capability. This study adopts a mixed research method, starting with quantitative analysis followed by qualitative analysis. Drawing upon social exchange theory, social learning theory, and the ability-motivation-opportunity theory, this study introduces organizational learning, knowledge sharing, coworker support, and psychological empowerment as mediating variables, constructing a multiple mediation model of Platform leadership's influence on innovation behavior. Study One analyzes the questionnaires of 550 employees using a structural equation model and verifies the multiple mediating effects of the model using bootstrap. Study Two conducts semi-structured interviews with 24 employees, and through data mining analysis using tools like Python and the open-source tool "Weiciyun," explores the underlying mechanisms between Platform leadership and innovation behavior. Finally, the conclusions from Study One and Study Two are compared. Platform leadership has a positive and significant influence on organizational learning, knowledge sharing, coworker support, and psychological empowerment. Organizational learning, knowledge sharing, and psychological empowerment have a positive and significant influence on innovation behavior. Platform leadership influences innovation behavior through organizational learning, knowledge sharing, and psychological empowerment, with organizational learning having the greatest mediating effect. The mediating effect of coworker support and the influencing mechanism between platform leadership and innovation behavior require further research and verification.

Keywords: Platform Leadership, Organizational Learning, Knowledge Sharing, Coworker Support, Psychological Empowerment, Innovative Behavior
1. Introduction

In the post-COVID-19 era, the digital transformation of the Chinese economy has reshaped the dynamics between employees and organizations. Chinese companies are witnessing a shift towards flatter, more decentralized, and platform-based organizational structures (Xie Rongbei, 2022). The role of leaders has also evolved, with the emergence of platform leaders who prioritize equality, sharing, and empowerment within Chinese companies. This management transformation, seen in companies like Haier, Xiaomi, and Oriental Selection, emphasizes concepts such as "platformization," "maker culture," and "de-emphasis on KPIs" for knowledge-based teams or members. Similarly, universities and research organizations have embraced a collaborative innovation approach where leadership focuses on building platforms and providing resources (Zhou Qing et al., 2023). Within this significant transformation in enterprise management models, Chinese scholar Hao Xuguang introduced the concept of "platform leadership" in 2014. This theory posits that both leaders and employees have self-actualization needs and defines platform leadership as a new leadership model that fosters a shared business platform, equal communication, and mutual growth with employees, ultimately leading to win-win outcomes.

Existing research indicates that authentic leadership, entrepreneurial leadership, inclusive leadership, distributed leadership, and benevolent leadership can stimulate employees' innovative behaviors and performance (Chen Wenpei, 2015; Fan Zili et al., 2021; Lu Hui et al., 2021; Shi Guanfeng & Yang Gaofeng, 2015; Zhang Yuqing, 2022). The key difference between platform leadership and the aforementioned leadership styles lies in the emphasis on bidirectional interaction and mutual success with subordinates (Hao Xuguang et al., 2021). Currently, only a small number of scholars in China have conducted exploratory studies on the relationship between platform leadership and innovative behaviors, with only one article using a mixed research method to discuss the relationship between platform leadership and employees' innovative behaviors, but this research goal was to establish measurement dimensions and items for platform leadership (Hao Xuguang et al., 2021). Although the study of platform leadership is gradually gaining attention from domestic scholars, there are still issues of inconsistent conceptual definitions, a lack of qualitative and quantitative research, and a limited research perspective (Xu Xi, 2022; Zhou Qing et al., 2023).

Organizational learning and knowledge sharing are two closely related variables. Generally speaking, the higher the degree of organizational learning, the more attention employees will pay to learning. Knowledge is the utmost vital resource element in the process of organizational learning. By engaging in knowledge sharing, enterprises and employees facilitate the circulation and value generation of knowledge, leading to an enhanced level of knowledge dissemination within the organization and a higher degree of organizational learning (Yang Jianjun & Xu Guojun, 2016; Zhang Zhengang et al., 2014). Hence, this study addresses the role of organizational learning and knowledge sharing as mediators, bridging the existing gap in the exploration of the influence of platform leadership on innovative behavior within the context of organizational learning and knowledge sharing.

In Chinese research, coworker support is mostly studied as a moderating variable, and there is inconsistency in the definition of concepts, limiting the research field (Liang Yaosheng & Fang Yawen, 2022; Jian Fuping & He Shirui, 2022). The current literature review lacks discussion on whether platform leadership behavior, as a novel leadership style, can facilitate coworker support, and whether coworker support can act as a mediator between platform leadership and innovative behavior. Therefore, this study investigates coworker support as a mediating variable to address the theoretical gap in current research.

In summary, this paper takes platform leadership as a new leadership model, based on social exchange theory, social learning theory, and the ability-motivation-opportunity theory. It introduces organizational learning, knowledge
sharing, coworker support, and psychological empowerment as four mediating variables, and constructs a multiple mediation model of platform leadership's influence on innovative behavior. This study will use a mixed research method combining quantitative and qualitative approaches to deeply investigate this new leadership style of platform leadership. The objectives of this study are as follows: first, to explore the effect of platform leadership on employee innovative behavior; second, to explore the mediating role of organizational learning, knowledge sharing, psychological empowerment, and coworker support that influence the effect of platform leadership on employee innovative behavior; and third, to investigate the underlying mechanisms of how platform leadership influences innovative behavior.

2. Literature Review and Hypotheses

2.1 Platform Leadership and Innovative Behavior

Platform leadership is a new type of bottom-up leadership proposed by Chinese scholar Haoguang Xu in 2014, based on the dynamic organizational environment and the emergence of knowledge-based employees in China's economic transformation. Platform leaders encourage the sharing of organizational resources and the development of a common cause with their subordinates, activate their own and their subordinates' potential, and enhance their work motivation. This style of leadership is characterized by mutual fulfillment and shared growth (Hao, 2016). English literature mainly defines platform leadership as companies, enterprises, or organizations that maintain or achieve market leadership in a platform environment or industry (Min & Kim, 2021; Wang et al., 2022). Hao Xuguang believes that the assumption of platform leadership is that every individual has the potential for self-actualization, and leaders should provide a platform for employees to achieve self-actualization (Hao, 2016). In line with grounded theory and previous research findings, Hao Xuguang et al. (2021) developed a measurement tool and classified platform leaders into six dimensions, resulting in a 28-item scale. These dimensions include “tolerance,” “charisma,” “revolution planning,” “platform building,” “platform optimization,” and “mutual growth”, and Platform building and optimization are the primary differentiators between platform leadership and other leadership styles.

Employee innovative behavior is a complex process that involves discovering problems, generating new ideas, promoting and supporting creative ideas, and finally implementing them (Scott & Bruce, 1994). Increasingly, scholarly literature suggests that an open and autonomous leadership style is the foundation for employee innovative behavior (Li, 2019; Wihuda et al., 2017). According to the reciprocity principle in social exchange theory, when employees feel respected and valued by their leaders, they are inclined to develop a sense of responsibility and internal motivation. This, in turn, fuels their desire to reciprocate by contributing behaviors that benefit the organization. (Cropanzano & Mitchell, 2005c). This article believes that platform leadership captures the need for employees' self-realization, stimulating their intrinsic value, releasing their innovative passion and willingness, and contributing to innovative behavior. At present, a few studies in China have shown that platform leaders promote employees' innovative behavior through the mediation of relationship identity, knowledge sharing willingness and basic psychological needs (Hao Xuguang et al., 2021; Wang Bingcheng & Hao Xinglin, 2023; Xu Xi, 2022). Based on the aforementioned analysis, this article suggests the following research hypothesis:

H1: Platform leadership has a significant positive impact on employee innovative behavior.


2.2 The Mediating Role of Organizational Learning Between Platform Leadership and Innovative Behavior

Aragón-Correa (2007) defines organizational learning from a knowledge perspective, which is to acquire and share knowledge to enhance the knowledge level of internal personnel. Platform leadership emphasizes mutual growth with subordinates. Leaders themselves continuously learn professional knowledge and leadership skills, frequently share and exchange new knowledge and skills with employees, encourage employees to accept and learn knowledge that contributes to personal and organizational development, and encourage employees to participate in knowledge sharing (Hao et al., 2021). Most scholars have affirmed the influence of leadership behavior on organizational learning (Shu, 2018; Ahsan, 2021; He, 2020; Wei, 2020). Berson et al. (2006) found that leaders can effectively promote organizational learning through talent policies. Chinese scholars have also demonstrated the significant impact of leadership style on organizational learning (Chen, 2008). Ding (2019) found that in the organizational learning atmosphere, Knowledge sharing positively impacts employee creativity. Han (2017) found that a learning-oriented organizational culture has a significant positive impact on innovation behavior. Previous studies have shown that organizational learning is an important influencing factor for employee innovative behavior, and Cohen & Caner (2016) have pointed out that organizational learning facilitates the matching of internal resources with external environment to achieve mutual adaptation, thus promoting innovative behavior and innovative performance. Wang (2021) used Hong Kong’s technology startup companies as an example to prove that organizational learning plays a moderating role between organizational innovation atmosphere and knowledge-based employee innovative behavior. Based on the analysis presented, the following research hypothesis is proposed in this article:

H2: Platform leadership significantly influences organizational learning in a positive manner.

H6: Organizational learning significantly influences innovative behavior in a positive manner.

H10: Organizational learning acts as a mediator between platform leadership and innovative behavior.

2.3 The Mediating Role of Knowledge Sharing Between Platform Leadership and Innovative Behavior

Platform leadership can transform followers’ attitudes and behaviors by building a common business platform with employees, creating a beneficial environment for knowledge sharing, eliminating worries and concerns after knowledge sharing, and making the process of knowledge sharing more attractive (Zhao, 2018). The social exchange theory has been widely applied to explain knowledge exchange within organizations. Sharing knowledge with the right individuals at the appropriate time is not only an effective way of coordinating and communicating among members within an organization, but also a key factor in building and maintaining organizational competitiveness. Leadership support for knowledge sharing is considered an important contextual factor that influences employees’ willingness to share knowledge (Lin, 2007). It was found that platform leadership affects employees’ innovation behavior by influencing their share knowledge intention (Xu, 2022). According to Wang & Hao’s (2023) study, knowledge sharing plays an intermediary role in platform leadership and business model innovation in enterprises. Currently, numerous research findings support the positive impact of knowledge sharing on innovative behavior (Ye et al., 2021; Rao Jada et al., 2019; Tang, 2021; Zhou & Cheng, 2018a). Knowledge sharing is often seen as a mediating variable for the impact of other factors on employee innovative behavior (Du et al., 2018). Based on the analysis provided, we can propose the following hypothesis in this article:

H3: Platform leadership has a significant positive impact on knowledge sharing.
H7: Knowledge sharing has a substantial and positive influence on the innovative behavior.

H11: Knowledge sharing acts as a mediator between platform leadership and innovative behavior.

2.4 The Mediating Role of Coworker Supported Between Platform Leadership and Innovative Behavior

Platform leadership emphasizes leaders providing a platform to help employees achieve their goals and establish a collaborative and supportive work environment. Zhang (2022) and Tang (2021) found that leadership behavior that emphasizes emotional intelligence and interpersonal skills can create a culture of inclusivity and empathy in the organization, help establish a supportive work environment, increase coworker support, and improve employee well-being and job engagement. Platform leaders' personal charm and traits of mutual growth can also set a good moral example in the organization, encourage subordinates to participate in co-building the cause, and encourage employees to participate in various ability training, thereby creating a positive and helpful atmosphere in the organization. Coworker support in this study included emotion and instrumental support. Studies have indicated that a positive communication and exchange environment is beneficial for fostering creative activities. Research has shown that when employees perceive their own job ability to be low, the likelihood of them engaging in innovative behavior decreases (Subrahmaniam & Rangaraj, 2008). However, colleagues providing timely advice, knowledge sharing, and knowledge transfer can effectively compensate for employees' lack of professional knowledge or abilities in the innovation process, enrich their knowledge and skill reserves, and meet the requirements of innovation tasks (Yan, 2019; Shi, 2020). Based on the analysis provided, this article proposes the following hypothesis:

H4: Platform leadership has a positive impact on coworker support.

H8: Coworker support has a positive impact on innovative behavior.

H12: Coworker support plays a mediating role between platform leadership and innovative behavior.

2.5 The Mediating Role of Psychological Empowerment Between Platform Leadership and Innovative Behavior

Psychological empowerment focuses on employees' internal perceptions and is an intrinsic motivational process (Menon, 2001). Xie (2022) found that platform leadership influences employees' voice behavior by affecting their level of psychological empowerment. The relationship between platform leadership and psychological empowerment is the relationship between external environment and internal cognition. Research has demonstrated that employees who experience a high level of psychological empowerment are more likely to display positive and proactive work attitudes, leading to an increased likelihood of engaging in innovative behaviors (Yang et al., 2022). Work performance and proactive innovative behaviors are positively influenced by psychological empowerment (Shi & Yang, 2015; Zhao et al., 2021). Employees with a higher level of psychological empowerment tend to exhibit more proactive innovative behaviors at work (Chen, 2015; Yang et al., 2022; Yong et al., 2022). This study believes that platform leadership enhances subordinates' perceived empowerment, and perceived empowerment, in turn, stimulates employees' innovative behavior. Based on the given statement, we can propose the following hypothesis:

H5: Platform leadership has a notable positive influence on psychological empowerment.

H9: Psychological empowerment has a significant positive impact on innovative behavior.

H13: Psychological empowerment plays a mediating role between platform leadership and innovative behavior.
According to the AMO model of performance proposed by Vroom (1964) and the prior research, it is believed that employees' effort level determines their job performance, and the level of task completion effort is influenced by their own abilities and motivation. This study considers employee innovative behavior as a complex system and introduces it as a capability factor, with psychological empowerment as a motivational factor, and platform leadership, organizational learning, coworker support as opportunity factors. By analyzing the interaction between individuals, contexts, and opportunities, this study aims to explain the impact mechanism of platform leadership, organizational learning, knowledge sharing, coworker support, and psychological empowerment on employee innovative behavior, within the framework of the AMO theory model. This study presents Figure 1 as the proposed research framework.
3. Research Methodology

3.1 Research Design

To follow the sequential explanatory mixed method research design process, this study utilized quantitative methods to validate the model and 13 hypotheses using SPSS and Smart-PLS analysis tools. The data collection process consisted of two stages: a pilot study and a formal study. Afterward, the results of the quantitative analysis informed the themes for the semi-structured interviews conducted in the qualitative analysis phase. This approach aimed to explore the factors and potential mechanisms underlying the influence of platform leadership on innovative behavior. Finally, the quantitative and qualitative results were compared to provide relevant discussions and research contributions.

The sample data for this study were collected from Guangxi, Shanxi, and surrounding provinces. These regions are ranked 19th and 20th in the Chinese economy. Employees in industries closely related to digitization, networking, or intelligence, such as manufacturing, software and information services, internet companies, and enterprises establishing digital platforms, were selected as subjects for investigation.

3.2 Study 1: Quantitative Research, Data Analysis and Hypothesis Testing

3.2.1 Sampling

Due to the large number of enterprises in Shanxi and Guangxi provinces, it is difficult to estimate the number of employees. The researcher employs a method to determine the sample size using a formula from Population’s work (Kalaya Wanichbancha, 2006). To ensure dependable information and minimize potential discrepancies, a minimum
sample size of 384.16 individuals is aimed for. This is intended to secure a percentage with negligible error (noted as "percentage5") at a 95% confidence level.

3.2.2 Instrument

In this study, mature scales from both domestic and international sources were used for variable measurements. The scales were revised based on the specific context of Chinese enterprises and the questionnaire's validity was confirmed through pre-surveys and interviews. A Likert 5-point scoring system was implemented, where a score of 1 represented "strongly disagree," and a score of 5 indicated "strongly agree". The platform leadership scale used in this study was developed by Hao (2021) and consists of a total of 6 dimensions and 25 items. The Cronbach's α coefficient value is 0.947. For employee innovative behavior, a 2-dimensional, 8-item self-report scale adapted from PAMELA et al. (1999) and revised by Gao (2015) was adopted. The Cronbach's α coefficient value is 0.829. The measurement for organizational learning was based on the scales translated and adjusted by Zeng (2021) and Lv (2013), originally developed by Sinkula et al. (1997). It consists of 3 dimensions and 12 items. The Cronbach's α coefficient value is 0.884. The knowledge sharing scale adopted scales from Chinese scholar Tian (2015) and Schepers et al. (2019), with a total of 2 dimensions and 12 items. The Cronbach's α coefficient value ranges from 0.768 to 0.833. The coworker support scale was adapted by Ding (2019) based on the revision of the scale by Tews (2013). It consists of 2 dimensions and 12 items. The Cronbach's α coefficient value is 0.925. The psychological empowerment scale used in this study was adapted by Li et al. (2006) from the scale originally developed by Spreitzer (1995).

3.2.3 Data Collection

To validate the research framework, a small-scale pilot study was conducted before the formal survey in this study. Based on recommendations from colleagues and friends, 60 managers and employees working in intelligent manufacturing and online platform companies in Shanxi and Guangxi were invited to complete an online questionnaire. Ultimately, 56 valid questionnaires were obtained. After analyzing the pilot study data, the researchers made improvements to the questionnaire. We used Corrected Item-Total Correlation (CITC) and the overall reliability coefficient of the constructs to optimize the measurement scales. Three items corresponding to TOL-2, PLB-2, and PLO-4 in platform leadership were removed, while the remaining 76 items were retained, resulting in improved scale reliability. The reasons for item removal are as follows: the CITC values for TOL-2, PLB-2, and PLO-4 in the tolerance dimension of platform leadership were 0.458, 0.447, and 0.475, respectively. All three CITC values were below 0.5. After removing the above-mentioned three items, the α coefficient values increased to 0.868, 0.889, and 0.909, respectively, which were higher than the overall α coefficient values of the respective constructs (0.858, 0.888, and 0.879).

For the formal survey (Study 1), data were collected using a Chinese online questionnaire platform. In total, 550 questionnaires were collected, and after excluding 32 invalid questionnaires, we obtained 518 valid questionnaires. Resulting in an effective response rate of 94.2%. The majority of respondents were from Shanxi (71%). In terms of gender, 64% were male. The majority of respondents (83%) were young and middle-aged workers between the ages of 26 and 45. About 80% of respondents had undergraduate education. Grassroots supervisors and employees accounted for 81% of job positions, and employees with 0 to 5 years of experience were the majority.

3.2.4 Results and Findings

3.2.4.1 Test Results of Reliability and Validity

In this study, the reliability and validity indicators of both first-order and second-order variables were obtained by running the PLS algorithm. The Cronbach's α values for all variables range from 0.818 to 0.965, and the composite
reliability (CR) values range from 0.825 to 0.967. These values are all above the standard of 0.7, indicating good reliability for this study (Fornell and Larcker, 1981). All factor loadings for the variables are above 0.6 and significant at the 0.001 level. The average variance extracted (AVE) values for all variables are above 0.5, indicating good convergent validity for this study (Hair et al., 2011).

This study is considered to have good discriminant validity based on the following criteria: the square root of the AVE for each variable is higher than its correlation coefficient with other variables. The majority of the HTMT values for this study’s variables are below 0.85, which should be below 0.9 (Henseler et al., 2015). Additionally, all items in this study have higher factor loadings on their corresponding variables compared to other variables (Hair et al., 2011).

3.2.4.2 Multicollinearity Test and Common Method Bias

In this study, the PLS algorithm was used to evaluate the Variance Inflation Factor (VIF) values. The VIF values for all items ranged from 1.502 to 5, with most values below the threshold of 3.3 (Kock & Lynn, 2012), indicating no significant multicollinearity issue.

Harman’s single-factor test was implemented using SPSS 25.0 in this study. The results revealed that the variance explained by the first factor was only 38.772%, which is below the standard of 40% (Harman, 1961). Additionally, the ratio of the average squared substantive factor loadings to the average squared common method variance (CMV) factor loadings was used to assess the presence of common method bias, following Liang et al. (2007). The final ratio in this study was 18.7:10, indicating no significant common method bias (Liang et al., 2007).

3.2.4.3 Hypothesis Testing and Model Evaluation

According to Hair et al. (2019), we used a 5,000-sample re-sample bootstrapping procedure (Ramayah et al., 2018) to report the path coefficients, standard errors, t-values, and p-values for the structural model. The results are presented in Table 1 and Figure 2. Table 1 provides a summary of the criteria used to test the developed hypotheses. The findings are as follows: platform leadership has a significant positive effect on innovative behavior (0.287, p < 0.001); platform leadership has a significant positive effect on organizational learning (0.654, p < 0.001); platform leadership has a significant positive effect on psychological empowerment (0.642, p < 0.001); organizational learning has a significant positive effect on employee innovative behavior (0.526, p < 0.001); knowledge sharing has a significant positive effect on innovative behavior (0.267, p < 0.001); psychological empowerment has a significant positive effect on innovative behavior (0.086, p < 0.001); coworker support does not have a direct significant effect on innovative behavior (-0.024, p > 0.5).

**Table 1: Hypothesis Testing Direct Effects**

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Original sample</th>
<th>Standard deviation</th>
<th>T statistics</th>
<th>P values</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>PL -&gt; EIB</td>
<td>0.287</td>
<td>0.071</td>
<td>4.024</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H2</td>
<td>PL -&gt; OL</td>
<td>0.654</td>
<td>0.033</td>
<td>20.064</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H3</td>
<td>PL -&gt; KS</td>
<td>0.540</td>
<td>0.038</td>
<td>14.074</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H4</td>
<td>PL -&gt; CS</td>
<td>0.569</td>
<td>0.033</td>
<td>17.304</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H5</td>
<td>PL -&gt; PE</td>
<td>0.642</td>
<td>0.029</td>
<td>22.379</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H6</td>
<td>OL -&gt; EIB</td>
<td>0.526</td>
<td>0.060</td>
<td>8.733</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H7</td>
<td>KS -&gt; EIB</td>
<td>0.267</td>
<td>0.055</td>
<td>4.815</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>Mediation Variable</td>
<td>Coefficient</td>
<td>t-Value</td>
<td>p-Value</td>
<td>Significance</td>
<td></td>
</tr>
<tr>
<td>------------</td>
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<td></td>
</tr>
<tr>
<td>H8</td>
<td>CS -&gt; EIB</td>
<td>-0.024</td>
<td>0.040</td>
<td>0.608</td>
<td>0.543</td>
<td></td>
</tr>
<tr>
<td>H9</td>
<td>PE -&gt; EIB</td>
<td>0.086</td>
<td>0.038</td>
<td>2.229</td>
<td>0.026</td>
<td></td>
</tr>
</tbody>
</table>

3.2.4.5 Mediation effect test

To test the mediation hypotheses, we followed the suggestions of Preacher and Hayes (2004; 2008) by bootstrapping the indirect effect. If the confidence interval does not straddle 0 then we can conclude that there is significant mediation. As shown in Table 2, PL -> OL -> EIB (β= 0.344, p < 0.001), which indicates that organizational learning mediates the relationship between platform leadership and innovative behavior, supporting hypothesis H10. PL -> KS -> EIB (β= 0.144, p < 0.001), indicating that knowledge sharing mediates the relationship between platform leadership and innovative behavior, supporting hypothesis H11. PL -> PE -> EIB (β= 0.055, p < 0.05) were all significant, suggesting that psychological empowerment mediates the relationship between platform leadership and employee innovative behavior, supporting hypothesis H13. However, the indirect effect of platform leadership through coworker support on innovative behavior was not significant, as shown in the table PL -> CS -> EIB (β= -0.014, p > 0.05). This means that coworker support does not mediate the relationship between platform leadership and innovative behavior, thus rejecting hypothesis H12.

![Figure 2: Results of the theoretical model using Smart-PLS](image-url)
Table 2: Hypothesis Testing Indirect Effects

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Relationship</th>
<th>Original sample</th>
<th>Standard deviation</th>
<th>T statistics</th>
<th>P values</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H10</td>
<td>PL -&gt; OL -&gt; EIB</td>
<td>0.344</td>
<td>0.043</td>
<td>7.950</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H11</td>
<td>PL -&gt; KS -&gt; EIB</td>
<td>0.144</td>
<td>0.031</td>
<td>4.680</td>
<td>0.000</td>
<td>Supported</td>
</tr>
<tr>
<td>H12</td>
<td>PL -&gt; CS -&gt; EIB</td>
<td>-0.014</td>
<td>0.023</td>
<td>0.602</td>
<td>0.547</td>
<td>rejected</td>
</tr>
<tr>
<td>H13</td>
<td>PL -&gt; PE -&gt; EIB</td>
<td>0.055</td>
<td>0.025</td>
<td>2.221</td>
<td>0.026</td>
<td>Supported</td>
</tr>
</tbody>
</table>

3.3 Study 2

3.3.1 Research Method and population

For Study 2, semi-structured interviews were conducted, and Python and Word Cloud were utilized for word frequency analysis, semantic network analysis, and sentiment analysis. During the interview phase, researchers asked participants questions based on a pre-designed interview outline and further probed and analyzed their responses. Referring to the study by Liu (2020), a total of 24 individuals were interviewed. The detailed information of the interviewees is shown in the following table. The total duration of the 24 interviews was 709 minutes. After transcription and summarization, the original Chinese interview transcripts contained 32,054 characters, which were translated into 19,993 English words. This article mainly uses the jieba word segmentation module in Python to process text corpus. With the help of the built-in stopword dictionary of the word cloud module, punctuation marks, symbols, pronouns, prepositions, conjunctions, and other words without actual meaning were removed from the corpus.

3.3.2 Results And Finding

3.3.2.1 Word Frequency Analysis and Word Cloud Analysis

Researchers used to exclude words with low relevance and meaninglessness to the research topic. Due to space limitations, only the top 100 high-frequency feature words are displayed. By analyzing word frequency, a word cloud was generated as shown in Figure 3. The top 10 words, such as "employees" (670), "platform" (309), "innovative" (498), and "leader" (283), can form the keywords of this article. This indicates that the respondents were able to answer closely related to the topic, and in the influencing mechanism of platform leadership and employee innovation behavior, knowledge, support, organization, sharing, and learning are placed at the core.
3.3.2.3 Semantic Network Analysis

Semantic network analysis examines how concepts, words, or ideas in textual content are connected and organized, revealing the underlying meaning and structure of the text. In this study, Python and word cloud analysis were used to analyze high-frequency words and conduct co-occurrence and clustering analysis.

From Figure 4, it can be observed that three major core nodes are formed around “employees”, “innovative”, and “platform leadership”. Firstly, the cluster centered around employees is connected to elements such as platform, innovation, leadership, support, and knowledge, which indirectly confirms the theoretical assumption of people-oriented platform leadership and reflects the core topics that employees generally pay attention to. Secondly, the cluster centered around innovative is connected to elements such as employee, platform, share, idea, knowledge, and support, demonstrating the close relationship between the occurrence of innovation or innovative behavior and employees, ideas, career platforms, and the sharing and support of knowledge and resources as perceived by the respondents. Thirdly, the cluster centered around platform leadership is connected to elements such as platform, employee, encourage, knowledge, and support, illustrating the close relationship between platform leadership and career platforms, employees, encouragement, knowledge, and support as perceived by the respondents.

Lastly, it is found that words such as psychological empowerment, organization, innovation, organizational learning, support, knowledge sharing, and coworkers are clustered around the main core “employees” in the first layer of the core layer, indicating that their relationships are particularly close.
3.3.2.3 Sentiment Analysis

In this study, the open-source tool "weiciyun" was used to analyze the sentiment types of the entire corpus. The "emotion dictionary" is a commonly used tool in sentiment analysis, which is a collection of emotion-related words. Based on the sentiment dictionary, this study classified the corpus into three different sentiment categories: positive (score > 0), neutral (score = 0), and negative (score < 0). The semantic construction features and content theme distribution were then analyzed.

Through sentiment analysis using "weiciyun", the results showed that 90.6% (925 sentences) of the interviews exhibited a positive sentiment, approximately 7.25% (74 sentences) had a neutral sentiment, and 2.15% (22 sentences) had a negative sentiment. This indicates that the interviewees generally perceive the influence of platform leadership on innovative behavior as positive and proactive, as shown in Table 3, Figure 5 and Figure 6. By examining the source data, it was found that all 24 interviewees acknowledged the positive impact of platform leadership on organizational learning, knowledge sharing, coworker support, and psychological empowerment. They also agreed that organizational learning, knowledge sharing, and psychological empowerment have a beneficial impact on promoting innovative behavior. Moreover, 80% of the interviewees agreed that coworker support has a positive influence on innovative behavior. The sentiment analysis results align with these favorable reactions.

Table 3: Basic Information Table for Sentiment Analysis.

<table>
<thead>
<tr>
<th>Number of Positive paragraph</th>
<th>Number of Negative paragraph</th>
<th>Number of Neutral paragraph</th>
</tr>
</thead>
<tbody>
<tr>
<td>330</td>
<td>1</td>
<td>9</td>
</tr>
</tbody>
</table>

Figure 4: Semantic Network Relationship Diagram
<table>
<thead>
<tr>
<th>Number of Positive Sentences</th>
<th>Number of Negative Sentences</th>
<th>Number of Neutral Sentences</th>
</tr>
</thead>
<tbody>
<tr>
<td>925</td>
<td>22</td>
<td>74</td>
</tr>
</tbody>
</table>

**Figure 5: Distribution of Text Sentiment Scores.**
Based on sentiment polarity classification, researchers extracted high-frequency words representing two different emotions, creating a word cloud (Figure 7). Core words such as "innovative," "encourage," "support," "share," "trust," "improve," "confident," "growth," and "motivation" were identified in the internal mechanism of platform leadership for influencing innovative behavior. These positive factors inspire innovative behavior among employees. However, the occurrence of negative and neutral words is noteworthy. In interviews on coworker support, 19 out of 24 respondents believed in its positive impact on employee innovative behavior. However, 4 respondents had uncertain opinions, and 1 believed there was no impact. From 5 interviews indicating a lack of relevance between coworker support and innovation, notable high-frequency words included "covid19," "competitive," and a Chinese proverb stating, "Teaching the disciple, starving the master." The COVID-19 pandemic and remote work have reduced intimacy among coworkers. Some employees perceive more competition than cooperation, withholding knowledge and skills. Automation and precise division of labor have also limited communication time for young employees, leading to a lack of support recognition and its positive impact on innovative behavior.

4. Conclusion and Discussion

4.1 Conclusion

This study was based on a mixed research method, conducting standardized quantitative analysis and in-depth qualitative analysis, and obtained the following theoretical findings:

Firstly, platform leadership plays a significant role in promoting employee innovative behaviors. The open and inclusive nature, the establishment and optimization of resources and platforms, and the traits of collective growth possessed by platform leadership can influence employees' internal motivation (autonomy and satisfaction with their achievement in the field) and improve environmental opportunity factors (such as promoting open collaboration, creating a learning culture within the organization, and facilitating knowledge sharing), ultimately enhancing employees' innovative behaviors.

Secondly platform leadership significantly promotes organizational learning, knowledge sharing, coworker support, and psychological empowerment. It achieves this by providing a career platform, supporting employees, sharing knowledge, and fostering collective learning. These factors except coworker support, in turn, have a significant impact on employees' innovative behaviors. The level of support from suitable career platforms, organizational resources,
psychological empowerment, and personal beliefs influences innovative behaviors. Organizational learning, knowledge sharing, and psychological empowerment serve as intermediaries between platform leadership and innovative behaviors, with organizational learning having a stronger impact. By establishing platforms, sharing resources, and fostering open collaboration and communication, platform leadership cultivates a learning culture that promotes knowledge sharing, internal knowledge transfer, cross-departmental collaboration, alignment of employee and leader vision, and continuous employee development. This leads to enhanced innovative capabilities and behaviors. Furthermore, platform leadership builds trust, empowers employees to co-create, encourages autonomy, reduces fear of innovation, and inspires innovation.

Lastly, coworker support does not significantly affect employees' innovative behaviors. The mediation role of coworker support between platform leadership and innovative behaviors is not evident. Platform leadership positively influences colleague support through its inclusive attitude, appreciation of diversity, emphasis on collective progress, provision of resources, information, and platforms, as well as encouragement of knowledge sharing and open communication. However, some respondents believe that coworker support may not have a positive impact on innovative behaviors or that the impact is uncertain. Further research is necessary to investigate and authenticate the underlying factors behind this phenomenon.

4.2 Theoretical Implications

This study enriches the research conclusions on the relationship between platform leadership and innovation behavior. Although there have been discussions on the influence mechanism of platform leadership on innovation behavior at home and abroad, there is still a lack of related quantitative and qualitative research (Li Ling et al., 2022; Xu Xi, 2022). Based on perspectives from social exchange theory, social learning theory, and ability-motivation-opportunity theory, this article constructs a multiple mediation model of the influence of platform leadership on innovation behavior and verifies its influencing mechanism, thereby improving the theoretical research in the field of platform leadership.

This study addresses the research gap in platform leadership and innovative behavior, using a creative sequential explanatory design, providing insights for future papers.

The significant mediating roles of organizational learning, knowledge sharing, and psychological empowerment in the relationship between platform leadership and innovation behavior have been identified, filling the gap in discussions on parallel multiple mediation effects. Furthermore, this study compares the mediation effects and discovers differences in the efficacy of the three mediation variables, organizational learning, knowledge sharing, and psychological empowerment, in explaining the inherent mechanism of employee innovation behavior. The multiple mediation model constructed in this article is more closely aligned with the complex and dynamic reality of enterprises, and it provides a powerful reference for future research on platform leadership.

4.3 Managerial Implications

Focus on developing platform leaders and facilitating mutual growth with employees. Stimulate employees’ self-fulfillment and leadership self-fulfillment through employee achievements. Cultivate organizational learning, create an inclusive learning environment, and promote knowledge sharing through training, internal platforms, and personal development. Prioritize employees’ psychological empowerment, strengthen emotional connection, support development and career planning, and inspire innovation.
4.4 Limitations and Future Directions

Firstly, the one-time questionnaire survey in this study resulted in static cross-sectional data. For future research, a tracking survey approach could be used to enhance the questionnaire's persuasiveness.

Secondly, the research subjects were mainly distributed in Shanxi and Guangxi. In the future, the research scope can be expanded by further increasing the sample size.

Thirdly, the data used in this study were self-reported by employees, which may lead to common method bias. In the future, data should also be collected from a third-party perspective, such as teams and leaders, to enhance the credibility of the research conclusions.

Fourthly, this study is an empirical research based on the Chinese context which may limit the cross-cultural application of the scale in this study.

Lastly, the relationship between platform leadership and innovative behavior may involve other mediating and moderating effects, such as organizational self-esteem, organizational culture, team psychological safety can be further explored in future research.

References


Zhang, Y. Q. (2022b). The impact of inclusive leadership on employee innovative behavior. Modern Commerce and Trade Industry, 43(01), 108-111.


Zhao, Y. X. (2018). Construction of platform leadership dimensions: Based on interpretive content analysis method.


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