

# Study on the relationship between innovation self-efficacy and innovation behavior

Chun Hu

Graduate School of Business, Graduate University of Mongolia, Ulaanbaatar, 14200, Mongolia

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**Abstract:** In order to investigate the relationship between innovation self-efficacy and innovation behavior, a questionnaire survey was conducted on employees in 19 provinces in China, including Sichuan and Chongqing, and descriptive statistical analysis, reliability analysis, validity analysis, analysis of variance, correlation analysis and regression analysis were conducted using SPSS software. and draw the conclusion: 1.The innovation behavior and innovation self-efficacy, and work involvement of the surveyed enterprise employees were in an above moderate.2.There are differences between gender and innovation self-efficacy, between company establishment and company nature and between innovation self-efficacy and innovation behavior, and between company tenure and innovation self-efficacy, job involvement and innovation behavior.3.There are significant positive correlations between innovation self-efficacy and job involvement, between innovation self-efficacy and innovation behavior and between job involvement and innovation behavior. Work involvement partially mediates the relationship between innovative self-efficacy and innovative behavior, work involvement partially mediates the relationship between innovative self-efficacy and innovative idea generation, work involvement partially mediates the relationship between innovative self-efficacy and innovative idea promotion, and work involvement partially mediates the relationship between innovative self-efficacy and innovative idea practice. In response to the findings of the study, it is suggested that enterprises can encourage employees more and provide them with a platform to showcase their work, and they can also provide more benefits to increase the degree of work involvement of employees, and they can also establish a sharing culture to encourage employees to learn and share with each other to enhance their internal power of innovation.

**Keywords:** Innovation self-efficacy; Work involvement; Innovation behavior.

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## 1. Introduction

Education, science and technology, and human resources are the fundamental and strategic support for the comprehensive construction of a modern socialist country. Innovation is the first driving force, insisting on the central position of innovation in the overall situation of China's modernization, focusing on creating top innovative talents and gathering talents from all over the world. The overall effectiveness of the national innovation system will be enhanced and an open innovation ecology with global competitiveness will be formed. Accelerate the implementation of the innovation-driven development strategy and enhance the capacity for independent innovation. Deepen the implementation of the strategy of strengthening the country with talents, insist on respecting labour, knowledge, talents and creativity, improve the strategic layout of talents, accelerate the construction of a world important talent centre and innovation highland, focus on forming a comparative advantage in international competition for talents, and gather outstanding talents from all walks of life to the cause of the Party and the people (Xi Jinping, 2022). It is particularly important for employees to exploit the development of innovative behavior. From the perspective of social cognitive theory, in order to enhance innovative behavior in China, first of all, each of us needs to be self-confident, believing in ourselves that we can do the right thing and innovate, which is what we call innovation self-efficacy. People have subjective motivation. When employees are "confident" and actively engaged in their work, does it help to generate innovative behavior? Based on social cognitive theory, this study proposes and validates a theoretical model of innovation self-efficacy - work involvement - innovation

behavior based on relevant literature, which can facilitate the design and implementation of human resource management strategies to stimulate employees' innovation behavior, improve the innovation efficiency of talents and enhance the core competitiveness of enterprises.

## 2. Literature review and research hypothesis

### 2.1. Related concepts

Innovative behavior can broadly speaking be divided into three levels: firstly, the innovative behavior of the company, secondly, the innovative behavior of the team, and thirdly, the innovative behavior of the individual employee of the organisation. This study focuses on innovation behavior at the individual (employee) level, i.e. the process by which employees in an organisation will continue to promote and practice innovative ideas when they arise.

Job involvement was first introduced from a psychological perspective by Lodahl and Kejner. It refers to the degree to which an individual identifies psychologically with the job he or she is currently doing, or the importance of the job in his or her overall self-image. Using Robbins (2005), Gu yuandong (2017) argues that job involvement is the extent to which individuals identify with their work, actively participate in it, and recognise the importance of job performance to their self-worth, and that employees with high job involvement have a strong sense of identification with the work they do.

Self-efficacy is a new concept proposed by Tierney and Farmer to reflect individuals' beliefs about their effectiveness in innovative activities. (Tierney P, Farmer, 2004)

## **2.2. The relationship between innovative behavior and innovative self-efficacy and work involvement**

It has been shown that there is a correlation between innovative self-efficacy and innovative behavior, with work involvement mediating the relationship between the two. The most representative study by Western scholars is the pioneering study by Tierney and Farmer (2002), who theoretically analysed the formation and mechanism of innovative self-efficacy based on the theoretical model of self-efficacy formation and mechanism of action proposed by Gist and Mitchell, and found through empirical research that innovative self-efficacy has a positive effect on individuals' innovative behavior. Csikazentmihalyi (1990) argued that work involvement positively predicted individuals' creative behavior. Chinese scholars have also conducted research in this area. Gu Yuandong and Peng Jisheng (2011) found that innovation self-efficacy had a positive effect on employees' innovative behavior and that job involvement mediated the relationship between innovation self-efficacy and innovative behavior in a sample of 478 corporate employees. Zhang Li (2015) concluded that work involvement was significantly and positively related to employee creativity.

## **2.3. Research hypothesis**

Based on the above analysis, the following hypotheses are proposed for the relationship between innovative behavior and innovative self-efficacy and work involvement.

H1: Innovation self-efficacy is significantly correlated with job involvement, i.e. the stronger the employee's innovation self-efficacy, the deeper the employee's job involvement.

H2: Innovation self-efficacy is significantly correlated with innovation behavior, i.e. the stronger the employee's innovation self-efficacy is, then the more innovative behavior the employee displays.

H3: Job involvement is significantly related to innovative behavior, i.e. the deeper the employee's job involvement, then the more innovative behavior the employee exhibits.

H4: Job involvement plays a mediating role in the relationship between innovation self-efficacy and innovative behavior, i.e. the stronger the employee's innovation self-efficacy, the deeper the employee's job involvement, and the more innovative behavior the employee displays.

## **3. Research Methodology**

### **3.1. Study sample**

In this study, 475 questionnaires were sent out to employees in 19 provinces and regions across China, including Sichuan Province and Chongqing Municipality, and 463 questionnaires were returned. 412 valid questionnaires were obtained by eliminating invalid questionnaires. Among them, basically half of the employees were male and half were female, most of them were aged 30-40 years old, and most of them were ordinary employees with education of bachelor degree or above. Most of the surveyed companies were private enterprises, and the company industries involved transportation, accommodation and catering, education and other industries, and most of the companies were established more than 10 years ago. The survey sample was chosen randomly and covered a wide range of areas, which is conducive to the study drawing credible conclusions.

### **3.2. Research tools**

**Innovation self-efficacy questionnaire.** This study measured innovation self-efficacy using the "Innovation Self-Efficacy" questionnaire developed by Tierney & Farmer (2002). I feel confident in my ability to use creativity to solve problems at work, I feel I am good at coming up with new ideas and thoughts, I am good at developing my own set of ideas from other people's ideas, and I am good at coming up with new ways to solve problems. The questionnaire consisted of four questions, and was scored on a five-point scale, with 1-5 representing "very inconsistent", "inconsistent" and "unclear", and "conforming" and "very consistent". The higher the score, the greater the employee's sense of innovation self-efficacy.

**Work Involvement Questionnaire.** Five items were selected from Lodahl and Mathilde's 20-item scale regarding employees' identification with their work, positive self-expression, and enjoyment of working in competitive work situations to demonstrate their value. I have a lot of passion and interest in my work, I am fully committed to my work, I enjoy spending most of my time on work-related matters and I am inseparably connected to my current job. The questionnaire consists of 4 questions on a 5-point scale, with 1-5 representing "very inconsistent", "inconsistent", "unclear", and "conforming" and "very consistent". The higher the score, the more involved the employee is in their work.

**Innovative behavior Questionnaire.** Using Janssen's (2000) concept, it is proposed that innovative behavior can be divided into three stages, including: the innovative idea generation stage, the innovative idea promotion stage and the innovative idea practice stage. The questionnaire uses a five-point scale, with 1-5 representing "very inconsistent", "inconsistent", "unclear", and "conforming" and "very consistent". The higher the score, the more significant the innovative behavior of the employees.

### **3.3. Research steps**

The questionnaire was tested for reliability and validity and purified to form a formal questionnaire. After passing the reliability, validity and normality tests on the survey data of 412 employees, descriptive statistical analysis, correlation analysis, analysis of variance, regression analysis and other data analysis processes were conducted to empirically prove the current status of innovation self-efficacy, work involvement and innovation behavior and the interrelationship between the three.

## **4. Study results**

### **4.1. Innovation behavior and innovation sense of self-efficacy, work involvement in the current situation**

Descriptive statistical analysis of the survey of 412 corporate employees is presented in Table 1. the data showed that innovative behavior and innovative self-efficacy and work involvement were at a moderate to high level. Further research revealed that there were significant differences in individual statistical variables for innovative behavior, innovative self-efficacy and work involvement. Specifically, gender has a differential effect on innovation self-efficacy, with the mean for male employees being significantly higher than that for female employees. There are also differences in the time of establishment of the company on innovation self-

efficacy and innovation behavior. The specific analysis shows that: the company establishment time shows a significant effect on innovation self-efficacy, "more than 20 years > 1-5 years, more than 20 years > 6-10 years, more than 20 years > 11-15 years", the company establishment time shows a significant effect on innovation behavior, comparing the difference can be seen that "more than 20 years > 1-5 years, more than 20 years > 6-10 years, more than 20 years > 11-15 years". The nature of the company makes a difference to my sense of self-efficacy and innovative behavior. The results of the comparison were: "Business unit>private enterprise, triple-funded enterprise>private enterprise, business unit>state-owned enterprise; business unit>associated enterprise", and "Business unit>associated enterprise". There is a more significant difference in innovation behaviors between the nature of the company, with the results of the comparison being: "Institution>private enterprise, TIPO>private enterprise, Institution>state-owned enterprise, TIPO>state-owned enterprise". The length of time in the company has a significant difference on my self-efficacy, work involvement, and innovation behavior. Specific analysis shows that: the length of service in the company has a more obvious difference on the self-efficacy of innovation, the score comparison result is "grassroots cadres > general employees, senior cadres > general employees", the length of service in the company has a more obvious difference on the work involvement, the score comparison result is There is a significant difference between "junior cadres > general employees" and "junior cadres > general employees".

**Table 1.** Variable means, standard deviations and correlation coefficients

Variables	Average value	Standard deviation	Creative self-efficacy	Work Involvement
Creative self-efficacy	3.936	0.733		
Work Involvement	3.955	0.752	0.732**	
Innovative behavior	3.900	0.726	0.813**	0.837**

\* p<0.05 \*\* p<0.01

Source: Compiled by this study

The results of the analysis of the correlation showed that innovation self-efficacy was significantly and positively correlated with work involvement with a correlation coefficient of 0.732 (p<0.01), and the research hypothesis H1 passed the test. Creative self-efficacy was significantly and positively correlated with creative behavior with a correlation coefficient of 0.813 (p<0.01), and the research hypothesis H2 was tested. Work involvement was significantly and positively correlated with innovative behavior with a correlation coefficient of 0.837 (P<0.01) and research hypothesis H3 was tested.

## 4.2. Linear regression analysis of innovative behavior on innovative self-efficacy and work involvement.

A linear regression analysis was conducted with innovative self-efficacy and work involvement as independent variables and innovative behavior as dependent variables. The model passed the F-test (F=863.617, p=0.000<0.05), which means that at least one of the two factors, self-efficacy and work involvement, has an effect on innovative behavior. The D-W

values are around the number 2, thus indicating that the model is not autocorrelated, there is no correlation between the sample data and the model is good. The final analysis showed that the regression coefficient for innovation self-efficacy was 0.427 (t=13.737, p=0.000<0.01), meaning that innovation self-efficacy has a significant positive effect on innovation behavior. The regression coefficient value for work involvement was 0.504 (t=16.641, p=0.000<0.01), implying that work involvement would have a significant positive influence relationship on innovative behavior. Therefore, innovation self-efficacy, work involvement all have a significant positive influence on innovation behavior and the research hypothesis H2.H3 is again validated.

**Table 2.** Results of linear regression analysis

	Regression coefficient	95% CI	VIF
Constants	0.227* (2.522)	0.051 ~ 0.403	-
Innovate My Self-Efficacy	0.427** (13.737)	0.366 ~ 0.487	2.158
Work Involvement	0.504** (16.641)	0.445 ~ 0.564	2.158
Sample size		412	
R <sup>2</sup>		0.787	
Adjustment R <sup>2</sup>		0.786	
F-value	F (2,468) =863.617, p=0.000		

Dependent variable: innovative behavior

D-W value: 2.041

\* p<0.05 \*\* p<0.01 t-values in parentheses

Source: Compiled by this study

## 4.3. Linear regression analysis of job involvement on innovation self-efficacy.

**Table 3.** Results of linear regression analysis

	Regression coefficient	95% CI	VIF
Constants	1.000** (7.757)	0.748 ~ 1.253	-
Innovate My Self-Efficacy	0.751** (23.301)	0.687 ~ 0.814	1.000
Sample size		412	
R <sup>2</sup>		0.537	
Adjustment R <sup>2</sup>		0.536	
F-value	F (1,469) =542.915, p=0.000		

Dependent variable: job involvement

D-W value: 1.942

\* p<0.05 \*\* p<0.01 t-values in parentheses

Source: Compiled by this study

As can be seen from Table 3, a linear regression analysis was conducted with innovative self-efficacy as the independent variable and job involvement as the dependent variable, the model equation was: job involvement = 1.000 + 0.751\*innovative self-efficacy, the model R-squared value was 0.537, meaning that innovative self-efficacy explained 53.7% of the variation in job involvement. When the F-test was conducted on the model it was found that the model passed the F-test (F=542.915, p=0.000<0.05), which means that innovative self-efficacy must have an influential relationship on work involvement, and the final specific analysis shows that the regression coefficient value of innovative self-efficacy is 0.751 (t=23.301, p=0.000<0.01), which means that innovative self-efficacy must have an influential relationship on work involvement. This means that there is a significant positive relationship between innovation

self-efficacy and work involvement. Therefore, all of the innovative self-efficacy will have a significant positive influence relationship on work involvement, and the research hypothesis H1 was again verified.

#### 4.4. A test of the mediating role of job involvement on the relationship between innovation self-efficacy and innovation behavior.

There are three models involved in the intermediate effects analysis, which are as follows: innovative behavior = 0.731 + 0.805\*Innovation self-efficacy, work involvement = 1.000+0.751\*Innovation I self-efficacy and innovation

behavior=0.227+ 0.427\*Innovation I self-efficacy + 0.504\*work involvement. Combined with Table 4, it can be seen that work involvement plays a partially mediating role in the middle of innovative self-efficacy and innovative behavior, and research hypothesis H4 passes the test. Because there are three dimensions of innovative behavior, regressions were again conducted, as shown in Table 5, and the study concluded that work involvement partially mediates the relationship between innovative self-efficacy and innovative idea generation, work involvement partially mediates the relationship between innovative self-efficacy and innovative idea promotion, and work involvement partially mediates the relationship between innovative self-efficacy and innovative idea practice.

**Table 4.** Summary of results of the intermediary role test

Item	c Total effect	a	b	a*b Intermediary effect value	a*b (Boot SE)	a*b (z-value)	a*b (p-value)	a*b (95% BootCI)	c' Direct effects	Test conclusion
Innovation I self-efficacy => work involvement => innovative behavior	0.805**	0.751**	0.504**	0.378	0.035	10.667	0.000	0.314 ~ 0.453	0.427**	Some agents

\* p<0.05 \*\* p<0.01

Source: Compiled by this study

**Table 5.** Summary of intermediary effect size results

Item	Test conclusion	c Total effect	a*b Intermediary effect	c' Direct effects	Formula for calculating the effect share	Effectiveness ratio
Innovation I self-efficacy => work involvement => innovative idea generation	Some agents	0.749	0.350	0.400	a * b / c	46.674%
Innovation I self-efficacy => work involvement => innovative ideas promotion	Some agents	0.825	0.406	0.419	a * b / c	49.220%
Innovation I self-efficacy => work involvement => innovative ideas in practice	Some agents	0.841	0.380	0.461	a * b / c	45.158%

Source: Compiled by this study

Based on the above studies, the conclusion is drawn: 1. The innovation behavior and innovation self-efficacy, and work involvement of the surveyed enterprise employees were in an above moderate. 2. There are differences between gender and innovation self-efficacy, between company establishment and company nature and between innovation self-efficacy and innovation behavior, and between company tenure and innovation self-efficacy, job involvement and innovation behavior. 3. There are significant positive correlations between innovation self-efficacy and job involvement, between innovation self-efficacy and innovation behavior and between job involvement and innovation behavior. Work involvement partially mediates the relationship between innovative self-efficacy and innovative behavior, work involvement partially mediates the relationship between innovative self-efficacy and innovative idea generation, work involvement partially mediates the relationship between innovative self-efficacy and innovative idea promotion, and work involvement partially mediates the relationship between innovative self-efficacy and innovative idea practice.

## 5. Conclusions and Outlook

Research has shown that innovation self-efficacy has a significant impact on employees' innovative behavior and that

work involvement plays an important role in the relationship between the two. Therefore, one of the ways to stimulate innovative behavior in companies is to enhance employees' sense of self-efficacy and strengthen their involvement in their work. Companies can provide more encouragement and a platform for employees to showcase their innovative approaches or effective key events in the workplace, so that they can be publicly praised or rewarded for their innovative self-efficacy. Companies can also provide more benefits to enhance employees' commitment to the company and their involvement in their work, so that their enhanced sense of innovation self-efficacy is more conducive to innovative behavior. Companies can also establish a sharing culture to encourage employees to learn from each other and share and exchange ideas to enhance their internal power of innovation. Once internal power is enhanced, the sense of self-efficacy for innovation is increased and more innovative behaviors will emerge.

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