

## **The Impact of Open Innovation Capability on Enterprise Innovation Performance -- The Moderating Effect of Organizational Learning**

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### **Abstract**

**This study through the network questionnaire to obtain 102 domestic enterprises to open innovation ability, innovation performance, organizational learning relevant data, through the Spss19.0 processing and analysis of survey data, the main research is the influence of open innovation ability innovation performance of its internal, and regulation of the related organizational learning between the two. The results show that the open innovation ability of the enterprise can have positive impact on innovation performance; organizational learning has a positive moderating effect between open innovation and enterprise innovation performance.**

### **Keywords**

**Open innovation capability; enterprise innovation performance; organizational learning.**

### **1. Preface**

At present, with the rapid development of the new era of knowledge economy, enterprises will not retreat or even die. From the perspective of innovation, any enterprise in such a big environment must improve its open innovation ability, in order to enhance the core competitiveness of the market and help enterprises to win opportunities in the fierce market competition. It can be said that the survival of a company depends largely on the size of its open innovation capability.

The acceleration of changes in the market environment, the acceleration of product upgrading, and the constant emergence of competitors require companies to continuously learn new knowledge and improve their core competitiveness. Many research results show that innovation plays a vital role in the development of enterprises. In an open market economy environment, the ability of enterprises to self-learn, the ability to accumulate knowledge and update, and effectively use knowledge and transform it into productive Capabilities are the ways and means for enterprises to continuously improve their innovation capabilities, and they are the key to transforming knowledge and innovation into competitiveness. When enterprises do not have obvious competitiveness in their own innovation, they will introduce externally available innovation capabilities into enterprises by breaking the traditional closed innovation model, helping enterprises to carry out technology and product research and development and expand the market. The development of open innovation can bring four benefits to the enterprise. First, the R&D cost of the enterprise will no longer be high, and the R&D cycle will be greatly shortened. Second, the accumulated technology and resources will no longer be used. Precipitation, the speed of circulation will be accelerated, which will also increase the company's income and increase the development reserve funds. Third, it can collect more manpower and resources for research and development, improve the success rate and speed of research and development, and further develop the market. It is possible to reduce the risk of innovation failure through joint research and development, and to prevent enterprises from affecting the survival of the whole enterprise because of an innovative research and development.

Previous research has shown that organizational learning has an impact on both open innovation capabilities and corporate innovation performance. Organizational learning can improve the company's open innovation ability by organizing employees to carry out targeted and planned improvement learning. Organizational learning can increase the ability of employees, explore the

potential ability of employees to promote the improvement of corporate innovation performance, and promote the formation of internal cohesiveness in the enterprise. The correct formation of employees' attitudes and values for learning, so that employees can be more Focus on the development of innovation. Many scholars have studied the relationship between open innovation ability, organizational performance and corporate innovation performance, but they all belong to the theoretical construction. Through academic search, it is found that the research on the role of organizational learning in the relationship between open innovation ability and corporate innovation performance has not been carried out. Therefore, this paper attempts to organize the school while studying the impact of open innovation ability on enterprise innovation performance. The role of regulation is related to the study, in order to effectively complement the theory of open innovation research.

## **2. Theory and Assumptions**

### **2.1 Open Innovation Ability and Enterprise Innovation Performance**

Open innovation ability is the sum of the series of capabilities that enterprises need to possess in order to promote good quality, innovation and efficiency, and to create high corporate value. Enterprise innovation performance is the efficiency of the company's innovation in technology and its effects, including the number and rate of patent applications, the number of new research and development products, the amount and intensity of resources invested by enterprises in innovation. Lichtenthaler U. and Lichtenthaler E divide open innovation capabilities into six types: change, desorption, invention, innovation, connection, and absorptive capacity. In the process of innovation, enterprises use six capabilities internally and externally. From the inside, the transformation of knowledge, through the ability to invent to complete knowledge exploration, through the ability to change to complete knowledge retention, through the ability to complete the use of knowledge. Externally, absorptive capacity can help companies explore knowledge, and connectivity can help companies to retain knowledge. Desorption can help companies to use knowledge. Chen Yan and Fan Bingquan studied SMEs as the subject of research, and studied the relationship between SMEs' open innovation ability and innovation performance. The results show that the six dimensions of open innovation ability have a positive positive impact on the innovation performance of SMEs. That is to say, the enterprise's transformation, desorption, invention, innovation, connection, and absorption capacity are becoming stronger while the enterprise Innovation performance will be correspondingly stronger. As the company's open innovation capabilities increase and enhance, companies will connect more and more external resources, absorb more and more new knowledge, and transform it into more and more productivity, at the same time, within the enterprise The reserve capacity of knowledge, technology and talents will be further enhanced. As the thickness of accumulation and precipitation continues to increase, the possibility that the technology and knowledge of the enterprise will change to qualitative change will be greater, and the higher the benefits will be. .

Hypothesis 1:Open innovation capability has a positive impact on corporate innovation performance.

### **2.2 Organizational Learning and Open Innovation Ability**

Organizational learning refers to the organization of various knowledge learning and technical learning behaviors to achieve and achieve the desired development goals, enhance the core competitiveness of the organization, and continuously strengthen the learning process to improve the organization's ability to change and change. At present, organizational learning is valued by the majority of enterprises, and it is regarded as an important way for enterprises to improve their adaptability. In the research of LEAVY et al., it is proposed that the three aspects of enterprise innovation in R&D, organization management and internal process management are related to enterprise innovation. Peng Hongxia and Da Qingli believe that the former can create a positive impact on the latter through research on organizational learning and open innovation capabilities. For innovation management, it can play a very important regulatory role between the two. Du Xueyan divides organizational learning into three dimensions. Learning is the attitude and values of

employees in the enterprise, which is very important for the improvement of the learning culture of the enterprise. An open mind is that employees can look at new things with open thinking and behavioral patterns. Open innovation is a new model of corporate development that requires employees to treat it with an open and acceptable attitude. Can make the learning of the company happen. The shared vision is the key to mutual support among employees, forming a good learning atmosphere and enhancing the driving force for learning. With a shared vision, the organizational learning of enterprises can last longer. The research results show that organizational learning can play a positive role in innovation ability from three aspects. Generally speaking, the higher the scores in the learning commitment and the more the employees share the vision, the better the staff's mind can be opened, thus enhancing the management and technical innovation ability of the enterprise. Organizational learning is considered to be an important way to improve the competitiveness of enterprises. Employees need to organize learning to understand new technologies and apply them to products in order to be eliminated by the market.

Hypothesis 2: Organizational learning has a positive impact on open innovation capabilities.

**2.3 Organizational Learning and Enterprise Innovation Performance**

Zhu Bing and others have drawn relevant conclusions after studying organizational learning and corporate performance. Research indicates that corporate culture can also have a positive effect on innovation performance. After studying both Zhang Fanghua and Wang Wenxia, the study is mainly divided into two modes. The first is adaptive learning. The second is creative learning. The research shows that these two kinds of learning also have a positive impact on business performance. The former produces a lower effect than the latter. Sun Yue and Zhao Chen believe that organizational learning can play an intermediary role in corporate emotional management and performance management. For Zou Guoqing and Gao Hui's research results, organizational learning can play a positive role in variable orientation .

Hypothesis 3: Organizational learning has a positive impact on corporate innovation performance.

Analyze the above related theories and results and propose hypotheses:

Hypothesis 4: Organizational learning has a positive adjustment effect on open innovation capabilities and corporate innovation performance.

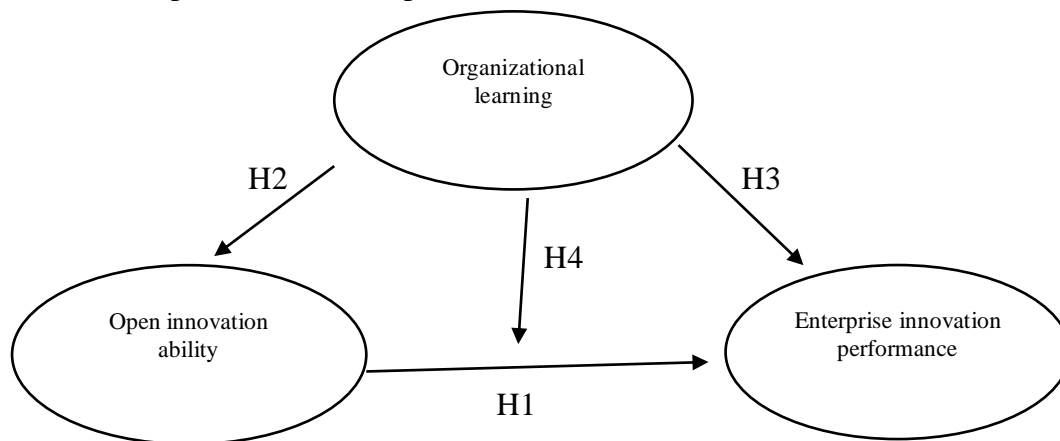


Figure 1. Research Framework

**3. Chapter 3: Research Methods**

**3.1 Research Sample**

In this study, questionnaires were distributed through the Internet, and questionnaires were filled out through questionnaires. A total of 110 questionnaires were retrieved and 102 valid questionnaires were collected. The recovery rate was 93%. The 102 companies surveyed are all business managers. The scale of the company is divided into 4 categories, 23 under 100, 36 in 100-500, 25 in 500-1000,

and more than 1000. 18 homes. The enterprise life is 1-5 years as the first classification. For each additional 5 years, there are 4 categories, the total length is more than 15 years, and the number of enterprises is 20, 25, 30, and 27.

### 3.2 Research Tools

#### 3.2.1 Open Innovation Ability Questionnaire

The open innovation questionnaire compiled by Chen Yan and Fan Bingquan contains six abilities and 24 questions, each of which is measured by six questions. Take the Likert five-point scoring method, the respondent will answer according to the degree, score 1-5 points.

#### 3.2.2 Enterprise Innovation Performance Questionnaire

Based on the research of Chen Jin et al., this study measures the innovation performance of enterprises through seven items, including the number of patents, the number of new products and services, and the success rate of product development. Take the Likert five-point scoring method, the respondent will answer according to the degree, score 1-5 points.

#### 3.2.3 Organizational Learning Scale

The main purpose of this paper is the organizational learning scale written by Baker in the late 1990s. Therefore, this learning scale is used to measure the degree of learning of the enterprise. There are three aspects in total. A first aspect is learning commitment. The second aspect is the shared vision. The third aspect is open mind. There are 18 questions in total. The score is calculated by means of a 5-point scoring.

### 3.3 Procedures and Analysis

In the research, mainly through the network questionnaire, through the effectiveness screening of the 110 questionnaires collected, 102 valid questionnaires were obtained, and spss19.0 was used for data. Statistical Analysis.

## 4. Chapter 4 Research Results

### 4.1 Reliability and Validity Analysis

The data of three variables were analyzed by SPSS19.0 software. The KMO values of the three questionnaires were all above 0.8, the open innovation ability of KMO=0.813, the organizational learning KMO=0.846, and the enterprise innovation performance of KMO=0.829. The validity of the questionnaires is high. The Cronbach a values of the three questionnaires were all above 0.7, the open innovation ability Cronbach a =0.761, the organizational learning Cronbach a =0.813, and the enterprise innovation performance Cronbach a =0.735, indicating that the reliability of the three questionnaires was good.

### 4.2 Relevant Analysis

It can be seen from Table 1 below. The open innovation ability has a very obvious relationship with the performance of the company.  $R_1=0.391$ ,. There are also positive effects on the six dimensions of innovation capability and performance.  $R_2=0.195$ ,  $r_3=0.081$ ,  $r_4=0.241$ ,  $r_5=0.186$ ,  $r_6=0.162$ ,  $r_7=0.214$ . The correlation between organizational learning and performance is  $r_8=0.174$ , and the calculated value of firm size and innovation performance is  $r_9=0.169$ . Through statistical analysis, it can be seen that there is no direct correlation between the time of establishment of the company and the performance.

Table 1. Correlation analysis between open innovation ability, organizational learning and corporate innovation performance (n=102)

	1	2	3	4	5	6	7	8	9	10
Enterprise innovation performance	0.391**	0.195**	0.081**	0.241**	0.186**	0.162**	0.214**	0.174**	0.169*	0.075

Note: \*P<0.05, \*\*P<0.01

1 = open innovation ability, 2 = change ability, 3 = desorption ability, 4 = invention ability, 5 = innovation ability, 6 = connection ability, 7 = absorption capacity, 8 = organizational learning, 9 = firm size, 10 = enterprise age

### 4.3 Regression Analysis

#### 4.3.1 Regression Analysis of Open Innovation Ability and Enterprise Innovation Performance

When using SPSS for analysis, the innovation performance of the enterprise is used as the dependent variable, and the size of the enterprise and the time of creation are put into the model one. Put the ability to innovate into the second model of the second layer. Both models can satisfy the F test by calculation. It can be seen from Table 2 that  $\beta = 0.45$ ,  $p < 0.01$ , and the ability to innovate has a positive impact on performance. It can thus be concluded that Hypothesis 1 can be verified.

Table 2. Regression results of open innovation capability and enterprise innovation performance (n=102)

	Variable	model 1	model 2
Control variable	Business scale	0.05	0.09
	Business age	0.08	0.01
Independent variable	Open innovation ability		0.45**
F		0.45	8.27**
Adj.R2		0.03	0.26
$\Delta$ Adj.R2		0.01	0.28

Note: \*P<0.05, \*\*P<0.01

#### 4.3.2 Regression Analysis of Organizational Learning and Open Innovation Ability

This section focuses on the analysis of organizational learning and innovation capabilities. The latter is used as a dependent variable. Put the size of the company and the time of establishment of the company into the model 1. Put the former into the model 2. Both models are able to satisfy the test of F. It can be seen from Table 3 that  $\beta = 0.65$ ,  $p < 0.01$ . It can be concluded that the former has a positive influence on the latter. Thus it can be assumed that Hypothesis 2 is verifiable.

Table 3. Regression results of organizational learning and open innovation ability (n=102)

	Variable	model 1	model 2
Control variable	Business scale	0.03	0.05
	Business age	0.04	0.01
Independent variable	Open innovation ability		0.65**
F		0.77	12.58**
Adj.R2		0.07	0.39
$\Delta$ Adj.R2		0.03	0.35

Note: \*P<0.05, \*\*P<0.01

### 4.3.3 Regression Analysis of Organizational Learning and Enterprise Innovation Performance

This section is mainly about the analysis of the relationship between variable organization learning and enterprise innovation performance. Use the latter as a dependent variable. In the same way, the size of the company and the time of establishment of the company are put into the model 1. Put the former into the model 2. The data indicates that the two models satisfy the F test. The calculation results are shown in Table 4 below as  $\beta = 0.79$ ,  $p < 0.01$ , which indicates that the former has a positive effect on the latter. So let Hypothesis 3 get the verification.

Table 4. Regression results of organizational learning and corporate innovation performance (n=102)

	Variable	model 1	model 2
Control variable	Business scale	0.04	0.06
	Business age	0.02	0.03
Independent variable	Open innovation ability		0.79**
F		0.81	14.56**
Adj.R2		0.07	0.45
$\Delta$ Adj.R2		0.04	0.43

Note: \*P<0.05, \*\*P<0.01

### 4.3.4 Analysis of Regulation

When using the analysis of the regulation effect. The process of between innovation and organizational learning should be an interaction. Let the company's innovation performance as a dependent variable in the calculation. And the size of the company and the length of the company's founding time as a model one. Put innovation ability in model two. In the third model, the product interaction term is placed. All three models are able to satisfy the F test. From Table 5 below, it can be found that  $\beta = 0.69$ ,  $p < 0.01$ . From the calculation results, it can be seen that the product terms between innovation ability and organizational learning are more obvious. It can be concluded that the latter has a very positive impact on the former. It is thus possible to judge that the hypothesis 4 is verified.

Table 5. Analysis results of adjustment effect (n=102)

	Variable	model 1	model 2	model 3
Control variable	Business scale	0.07	0.05	0.08
	Business age	0.05	0.02	0.01
Independent variable	Open innovation ability		0.71**	0.73**
Adjustment variable interaction term	Open innovation ability * organizational learning			0.69**
F		0.81	14.56**	15.37**
Adj.R <sup>2</sup>		0.07	0.23	0.45
$\Delta$ Adj.R <sup>2</sup>		0.04	0.22	0.40

## 5. Discussion and Conclusion

Through the research in this paper, it is found that the developmental innovation ability has a significant effect on the innovation performance of the enterprise and the influencing factors of the six aspects. The size of the business has a positive impact on the performance of the company. The time when the company was founded is not directly related to the performance of the company.

For enterprise open innovation, it is one of the decisive factors that can improve the competitiveness of enterprises in the market. In the research of this article, the innovation ability is mainly divided into six aspects. The first aspect is change. The second aspect is desorption. The third aspect is the invention. The fourth aspect is innovation. The fifth aspect is the connection. The sixth aspect is absorption. These can help companies to transform their knowledge. Through continuous storage of knowledge, a process of qualitative change is finally achieved.

For organizational learning, it is an important channel for enterprises to continuously improve their own capabilities. The three dimensions in this study are reflected in the better. The ultimate learning effect achieved is more obvious. And the stronger these three dimensions, the stronger the innovation performance of the company. Thus, it can be found that there is a positive positivity between innovation performance and performance.

The stronger the organizational learning shows, the stronger the development potential of its employees. And to work together on innovative research, the effect of such research is more obvious. From these, it can be seen that organizational learning and innovation capabilities have a positive impact.

Through the research in this paper, it is found that the better the organization learning of the enterprise, the stronger the cohesiveness it exhibits, and it can satisfy the needs of all aspects. For such a situation, open innovation management and innovation performance will become more and more close and can have an effective positive impact.

While actively introducing external resources to enhance their open innovation capabilities, enterprises should also pay attention to the improvement of internal organizational learning. The increase in organizational learning can not only directly affect corporate innovation performance, but also strengthen openness as a regulatory variable. The relationship between innovation capability and corporate innovation performance, thereby enhancing the growth of corporate innovation performance, enabling enterprises to remain invincible in the market.

This article examines the impact of open innovation capabilities on corporate innovation performance. This will support relevant research advancements, enabling companies to recognize the role and role of open innovation and organizational learning in business development.

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