

THE RELATIONSHIP BETWEEN ORGANIZATIONAL LEARNING, KNOWLEDGE MANAGEMENT AND INNOVATION PERFORMANCE OF TECHNOLOGY- BASED SMES

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Abstract:

The Relationship between Organizational Learning, Knowledge Management and Innovation Performance of Technology-Based SMEs" by Jing Chen focuses on the interaction between organizational learning, knowledge management, and innovation performance in small and medium-sized enterprises (SMEs). It addresses the lack of studies on the impact of science-based knowledge management and organizational learning on SMEs. The article proposes research questions and objectives concerning the development of technology SMEs through organizational learning and knowledge management, the formation of internal driving forces through knowledge management mechanisms, and the acquisition of breakthrough innovation impetus within organizations.

Keywords: Organizational Learning, Knowledge Management, Innovation Performance, Technology-Based SMEs, Science-Based Knowledge Management, Internal Driving Forces, Breakthrough Innovation, Research in SMEs.

Chapter 1 Brief background of the study

At present, the scientific and technological innovation of small and medium-sized enterprises needs the effective use and configuration of organizational learning. Through the knowledge management and communication learning with partners, the acquired experience and management methods, as well as the innovation ability of knowledge workers, are internalized into the organization, thereby continuously improving the creativity of the organization.

Chapter 2 Purpose statement

Studies on the impact of innovation performance on SMEs mainly focus on R&D partnerships (Gonzalez-brambila CN,2013) and industrial alliances (Zhou J,2009; Bin G,2018), overseas knowledge input (Shanghangbiao, 2015) and other aspects of the impact of science-based knowledge management and organizational learning on SMEs are relatively few studies. At the same time, many enterprises realize differentiated management by optimizing the management mechanism, which plays a regulating role in the knowledge management and innovation performance of SMEs. However, there is relatively little research on the actual effect of the moderating effect of knowledge workers' innovation ability.

Chapter 3 Research Questions

In view of the above content, this study puts forward the following questions: (1) Can science and technology SMEs develop through organizational learning and knowledge management? (2) Can SMEs form internal driving force through knowledge management mechanism? (3) Can science and technology SMEs obtain breakthrough innovation impetus within the organization?

Chapter 4 Research objectives

- (1) Methods and paths for SMEs to acquire external knowledge
- (2) Methods to form continuous driving force through knowledge management system innovation.

Chapter 5 Scope of study

Scope of content

This study mainly discusses the relationship mechanism between organizational learning, knowledge management and enterprise innovation performance in Chinese technology-based SMEs, which can be divided into the following five aspects:

- (1) The influence mechanism of organizational learning on innovation performance of small and medium-sized technology-based enterprises;
- (2) The influence mechanism of organizational learning and knowledge management;
- (3) the intermediary influence mechanism of knowledge management;
- (4) Adjustment and influence mechanism of innovation ability of knowledge workers.

Range of population

The object of this study is the small and medium-sized technology-based enterprises that have been established for more than three years and have innovative behavior or certain big data capability. The questionnaire survey will interview and investigate the grass-roots employees or managers of the enterprises that meet the requirements, so as to achieve full coverage as far as possible, and effectively avoid the research deviation caused by other different factors.

Research scope

The vast size of China has led to great cultural differences between different regions, especially between companies in Hong Kong, Macao and Taiwan. Their institutional environment, property rights model and institutional mechanism are completely different from those in mainland China, which will also affect the organizational learning model and knowledge management of all relevant enterprises. Therefore, the research object of this study is mainland China.

Scope of variables

Table 4.1 Variable representation

Type of variable	Variable	Endorsed theory	References
DV	Enterprise innovation performance	Market performance; Product performance	(Cloudt et al.,2012); (Hagedoom and Cloud,2003); (Lai,2014)
IV	Organizational learning	In-cluster learning; Out-of-cluster learning	(Bayona et al,2001); (Belderbos et al.,2004); (Miotti,Sachwald,2003)
Mediating variable	knowledge management	Knowledge creation; Knowledge sharing; Knowledge utilization	(Carrillo,Gaimon,2004); (Casanueva et al.,2013); (Costa,Monteiro,2016)
Regulating variable	Innovation ability of knowledge workers		(Drucker,1999); (Xu Kaige, 2020)

Chapter 5 Terminology

Organizational Learning

Enterprises are increasingly building learning relationships with a variety of external partners, including customers, suppliers, universities and even competitors, to integrate their value co-creation processes (G. Wang et al., 2015). Based on the resource-based theory, the cooperative relationship between organizations is analyzed. From this perspective, enterprises can further develop and enhance their competitiveness through continuous collaborative learning (G.Wang et al., 2015). However, it is becoming increasingly difficult for any company or organization to use internal development as all the capabilities needed to foster innovative development (Chesbrough, 2003). Therefore, enterprises pay more and more attention to

enhance the competitiveness of enterprises by cooperating with partners and sharing resources, which is the organizational learning mentioned in this paper. This can be understood as an extension of the enterprise resource base theory (Loebbecke et al., 2016). According to this approach, pooling public resources to establish cooperative learning relationships will become a determining factor for enterprise success (Cheng, Fu, 2013). In addition, enterprises' emphasis on innovation and innovation ability are key aspects of supplychain strategic management (Hult et al, 2004).

Knowledge Management

Knowledge management contributes to effective information exchange and cost- effectiveness. (Afiiah,1998) proposed that the key of innovation activities is to apply new knowledge to commercialization and create enterprise value. Innovation activities of technology-based SMEs refer to the concept of enterprise members contributing implicit technology and knowledge to create and validate new products. The knowledge gained by individuals in the process of innovation spreads to different departments and even to different organizations. Therefore, knowledge management is one of the main forms of reducing uncertainty when transforming technical systems (Carrillo,Gaimon,2004; Casanueva et al., 2013; I. Onaka, 1994).

Innovation ability of knowledge employees

Innovation is the ultimate result of knowledge worker's ability. According to Drucker's theory of knowledge worker productivity, knowledge workers have the characteristics of self- management, work autonomy, quality delivery, etc., and organizations regard knowledge workers as assets to determine their productivity through continuous learning and sharing of knowledge (Drucker, 1999). Therefore, how to make full use of knowledge and skills and enhance the creativity of existing work is the work state that knowledge workers actively pursue and yearn for. Innovation ability puts knowledge workers in an advantageous position.

Innovation performance of technology-based SMEs

Technology-based SMEs refer to small and medium-sized economic entities that rely on a certain number of scientific and technological personnel, take the market as the orientation, mainly provide high-tech or services, and engage in scientific and technological research and development, production and sales activities (Fang Jianqi, 2020). Chinese and foreign scholars have studied the measurement of enterprise innovation performance. Among them, foreign scholars clodt et al. (2012) believe that an enterprise's innovation performance is determined by innovation activities and can be measured by the number of R&D, patents and new products. Lai(2014) divided innovation performance into market performance and product performance from the perspective of strategic operation.

Chapter 6 Benefit of the study

Theoretical Significance

(1) Previous studies on the impact of organizational learning on innovation performance mostly focused on enterprises in a general sense (Xu Huimin et al., 2016; Di Wei et al., 2015).

(2) Based on the existing knowledge management research, this study can increase the depth of knowledge management theory research and explore the interaction between its constituent dimensions.

(3) There is less research on the intermediate path between organizational learning and innovation performance, and even less research on technology-based SMEs. Therefore, this study can fill in the gap.

Practical Significance

(1) Research on knowledge management can help enterprises better understand the relationship between knowledge management and innovation performance based on China's environmental background.

(2) This study attempts to explore the mediating role of knowledge management in organizational learning and innovation performance, so as to provide a referential development path for the innovation practice of Chinese technology-based SMEs.

Chapter 7 Novelty of the study

Based on the organizational level, this study plans to explore the factors affecting innovation performance in the field of open innovation. The plan is to thoroughly analyze the complex relationship between organizational learning, knowledge management, innovation ability of knowledge workers and

innovation performance, and improve the existing open innovation research.

Chapter 8 Concept-related theories involve hypotheses

Organizational learning and innovation performance of technology-based SMEs One of the most popular classifications of cross-industry management innovation among technology-based SMEs is based on Lundvall's pioneering study (Jensen et al., 2007). It explains this heterogeneity by distinguishing between two modes of innovation :STI(science,technology, and innovation) and DUI(implementation, use, and interaction)(Jensen et al., 2007). Technological innovation is characterized by the use of scientific methods and is largely based on well-curated scientific and technical knowledge (Jensen et al., 2007). This innovation model is strongly dependent on formal R&D activities of innovative technology- based SMEs. Based on the above analysis, this study proposes the following hypotheses: **H1: organizational learning has a positive impact on SME innovation performance.**

Organizational learning and knowledge management

Learning has become a key capability in the enterprise knowledge economy, and knowledge management-driven organizations can achieve this goal through mixed learning from different approaches and channels (Chen Jin et al., 2017). High performing organizations require ongoing education and training of employees, which is a core concept for building teams and achieving personal growth (Falconer,2006). Byrd(2016) explains that employees who gain knowledge from organizational learning are better able to communicate with managers and ask thoughtful questions. Therefore, we can propose the following hypothesis:**H2: organizational learning has a positive impact on the knowledge management.**

Internal influence mechanism of knowledge management

Knowledge is not only a static resource, but also an element of small and medium-sized technology-based enterprises, constantly circulating in the process of production, operation and management (Lei Yi and Chen Yunchuan, 2011). The dynamic knowledge management capabilities of technology-based SMEs can optimize the allocation of internal and external knowledge resources of technology-based SMEs through activities such as search, acquisition, integration, dissemination, sharing, transformation, coordination and innovation(Becerra-Fernandez,Sabherwal,2010; CantnerU JoelK, schmidt, 2019; Yu Liangru et al., 2020), so as to enhance the dynamic response ability of technology-based SMEs to changes in environment, market and customer demand. Based on the above analysis, hypothesis 4 is proposed.

H4: knowledge management has a positive impact on innovation performance of technology-based SMEs.

Mediating role of knowledge management

To achieve a successful knowledge management, it is important to realize the commitment of the leadership team, a healthy culture conducive to change, and knowledge management expertise (Bennis et al., 2013; Qi Zhenxing, Zhu Bixiang, 2020). The characteristics of a true knowledge organization include: high performance, customer driven, improvement driven, high learning rate, innovation driven, excellence driven, flexibility and adaptability, high level of professional knowledge, self-orientation, initiative, values, knowledge sharing (Liebowitz,1999; Maravelias, 2003; Ren Hao, Tong Xing, 2021). The paradigm of organizational learning needs to change from simply testing knowledge as an object independent of the user to understanding and accepting that critical knowledge may be an ability that cannot be mechanically coded and delivered.

H4: Knowledge management plays a mediating role in the positive relationship between organizational learning and innovation performance in technology-based SMEs.

The moderating effect of knowledge workers' innovation ability

Based on the theory of knowledge-based enterprise, the effective management of knowledge resources can improve the innovation ability (Andreeva,Kianto,2011; Grant,1996; Zhu Jianmin, Ding Yingying, 2017). Since knowledge innovation is the result of employee productivity, it can be inferred that knowledge management has a positive impact on innovation ability (Iranzadeh Pakdelbonab, 2014). Based on the above analysis, hypothesis 6 of this study is proposed.

H5: The innovation ability of knowledge workers positively regulates the relationship between

knowledge utilization and innovation performance.

Chapter 9 Research conceptual framework

Based on the above six hypotheses proposed by deducing the mechanism of organizational learning, knowledge management, innovation ability of knowledge workers and innovation performance variables, this study sorted out the hypothesis logic and constructed a conceptual model of the relationship between variables, as shown in Figure 1.

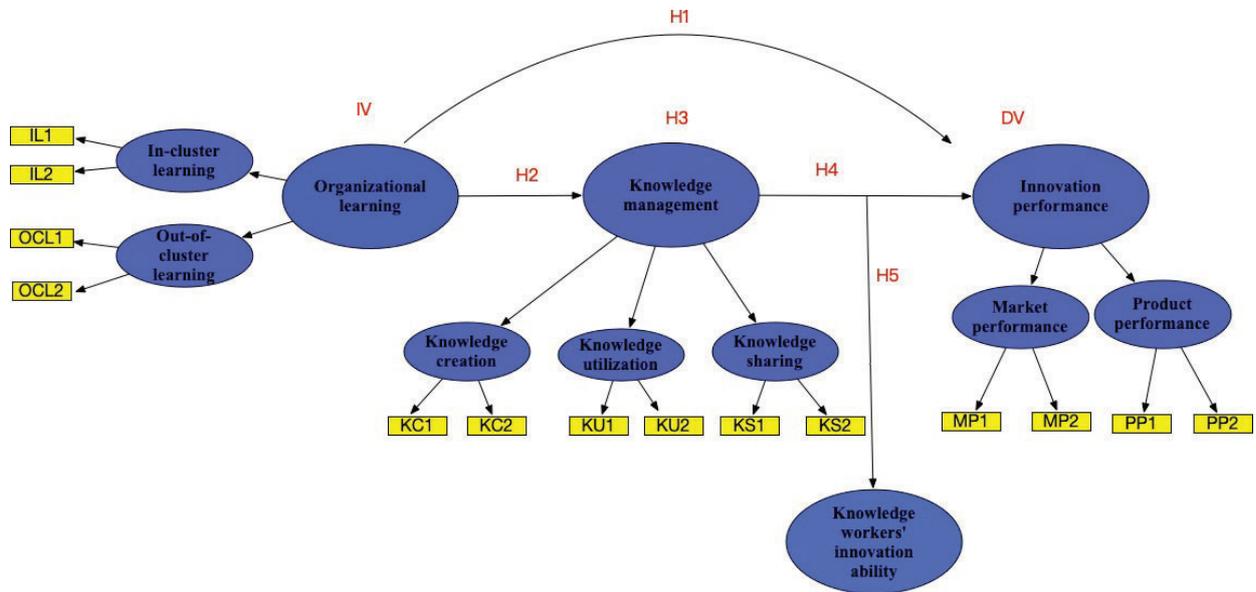


Figure 1 Conceptual model

Chapter 10 Research methodology

Research methods: Mixed method

Research design: Exploratory sequential mixed method

Based on the conceptual model and variable related hypothesis, this research plan reasonably determines the measurement method of variables in this study by reading a large number of relevant literature, among which variables mainly include organizational learning, knowledgemanagement, innovation ability of knowledge workers and enterprise innovation performance, and the plan divides variables into detailed indicators. The method of pre-test ensures the reliability, validity and accuracy of the feedback after the questionnaire is issued. The correctness of the research design was ensured through the collection of pre-test questionnaires, descriptive statistics and reliability and validity analysis. Finally, the formal test data were analyzed and processed by SPSS and AMOS.

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