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The Influence of Knowledge Management on Team Innovation Performance——Based on the Moderating Effect of Team innovation atmosphere

Dan Luo

School of Management, Shanghai University Shanghai,200000, China

ABSTRACT. *This article examines the impact of knowledge management on team innovation performance. As an independent variable, knowledge management quantifies knowledge management through the SECI model of knowledge management, and uses the Likert 5-level scale to monitor the specific level of team knowledge management; team innovation performance as a dependent variable, that is, through innovation ability, Behavior and outcome are measured. Join the team atmosphere as a tuning variable to explore how the team atmosphere affects the relationship between knowledge management and team innovation performance. Research shows that knowledge management positively affects team innovation performance, and in a positive team atmosphere, the positive effect is more obvious. This research reveals that the whole process of knowledge management can promote team innovation, and the strength of promotion is different in different parts. At the same time, the team atmosphere can significantly adjust the positive impact.*

KEYWORDS: *knowledge management, team atmosphere, team innovation performance*

1. Introduction

In recent years, with the changes in the business environment and technological environment, more and more teams have begun to pay attention to the importance of knowledge resources to the development of team strategy. How to capture and use the knowledge and experience of team members is an important issue facing team knowledge management. How to conduct knowledge management to promote team innovation performance is worth our thinking.

Knowledge has become an important tool for team competition and a key way for a team to gain a competitive advantage. Knowledge management is of great significance to team development. The importance of team knowledge management

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is being valued by more and more companies and organizations. At present, the most classic knowledge transformation model in academia is the SECI model proposed by Nonaka, which contains four modes of mutual transformation of tacit knowledge and explicit knowledge, which are specifically divided into socialization, externalization, connection and internalization. For this model, there are many derivatives in the academic community, such as the IDE-SECI model proposed by Geng Xin, which extends the process chain of knowledge management to seven stages by introducing external knowledge input; Chu Jianxun's Q-SECI model based on insight learning . Although the SECI model has some shortcomings, such as ignoring the loss of knowledge caused by the loss of team employees, the importance of external knowledge learning, etc., it fully explains the entire process of knowledge management, which is of significance for the research of this article on team innovation performance

Through reading the literature, the understanding of knowledge management in this article is to build a quantitative knowledge system in the team, so that the knowledge in the team can be continuously fed back into the knowledge system through the process of acquisition, creation, sharing, integration, updating, and innovation. , Forming a cycle of knowledge management, and becoming the intellectual capital of management and application within the team.

In previous studies, knowledge management has been studied as a perspective or application, and the impact of knowledge management on team innovation performance is rarely discussed. At the same time, according to literature reading, in the field of team research, team atmosphere is regarded as an important input variable that affects team performance, and team innovation performance is an important part of team performance. Does the team atmosphere also affect team innovation performance? Use team atmosphere as a moderating variable for in-depth discussion.

2. The core of knowledge management and the composition of team innovation performance

2.1 SECI Model of Knowledge Management

According to this model, knowledge is divided into explicit knowledge and tacit knowledge. Explicit knowledge can be expressed in words, in the form of books, reports, papers, etc.; tacit knowledge is expressed as skills, experience, intuition, perception, and insight that are difficult to express. Through reading the literature, it is generally believed that tacit knowledge has a more important impact on team knowledge creation. Ikujiro Nonaka proposed that in the process of enterprise innovation activities, tacit knowledge and explicit knowledge interact and transform each other, and the process of knowledge transformation is actually the process of knowledge creation. This feature also applies to teams.

Knowledge management is divided into four fields: knowledge socialization, knowledge externalization, knowledge integration, and knowledge internalization.

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Knowledge socialization is the transformation of tacit knowledge to tacit knowledge. The employees in the team obtain tacit knowledge through observation, imitation, and sharing. Such knowledge is not expressed in words. It is in an informal setting. This is also the stage of creativity; the externalization of knowledge is the transformation of tacit knowledge to explicit knowledge The transformation of knowledge, expressing opinions in words and other forms, integrating knowledge, is conducive to the understanding and learning within the team, is the integration stage of knowledge; knowledge integration is the combination of explicit knowledge and explicit knowledge, screening and sorting out fragmented explicit knowledge Organize the knowledge system into an easy-to-save form such as documents. This stage is the process of updating knowledge; internalization of knowledge is the process of internalizing the organization's explicit knowledge into individual tacit knowledge. Through the knowledge update of the previous stage, the collection is organized To gain new knowledge, through internal employee training, etc., they can acquire new knowledge and internalize it into their own knowledge for use in work. Figure 1

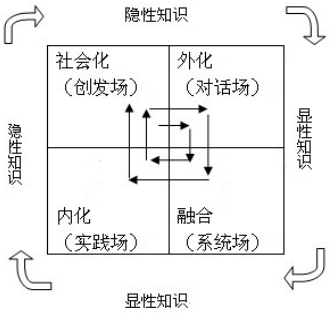

Figure. 1 SECI model

2.2 Team innovation performance

Through knowledge management, the team conducts knowledge transformation. This process generates new knowledge. Employees internalize new knowledge and apply it to work, such as using new solutions to solve problems, with good results. This is the most intuitive innovation benefit brought to the team by team knowledge management.

This article measures the team's innovation performance from three aspects, innovation ability, innovation behavior and innovation results. Innovation ability expresses the subjective initiative of team members to innovate and is willing to take the initiative to participate in innovation; innovative behavior has specific innovation performance in the work; the result of innovation is the interaction of the first two, excellent innovation ability and positive innovation behavior can produce good The result of innovation. Nowadays, team competition is the competition of team innovation. Researching its impact on team innovation performance through

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knowledge management is also a side answer to how the team can gain a competitive advantage through knowledge management. Figure 2

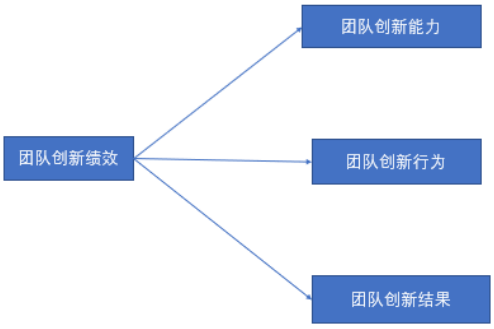

Figure. 2 Team innovation performance

Innovative ability is the willingness of team employees to actively do innovative work or propose new solutions. Innovative behavior and innovation results are employees' application of innovative methods and good results, or the number of team innovations such as patents and core technologies. Wait to increase. It can be seen that the ability to innovate, behavior and results are a complete process of correlation. Knowledge management is the complete process of knowledge transformation. It shows the process of sharing, acquiring, organizing, applying and innovating the knowledge of team employees. Good knowledge management of the team is conducive to the innovation of the team, thereby enhancing the innovation performance of the team. Therefore, this article proposes the following assumptions:

H1 Knowledge socialization will have a significant positive impact on team innovation performance

H2 Knowledge externalization will have a significant positive impact on team innovation performance

H3 Knowledge integration will have a significant positive impact on team innovation performance

H4 Internalization of knowledge will have a significant positive impact on team innovation performance

3. The influence of team atmosphere on team innovation performance and its function

3.1 The connotation of team atmosphere

Organizational atmosphere is gradually formed in the continuous communication and interaction between employees, and has a certain impact on all aspects of

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employees. Team is also a form of organization, when members of the team or organization in the same environmental conditions (organization tasks, team tasks) produce the same perception. A good organizational atmosphere can stimulate the enthusiasm and creativity of members. On the contrary, a dull organizational atmosphere will not only make members feel very depressed, but also is not conducive to the initiative of members.

3.2 Dimensions of team atmosphere

Research on organizational climate. Xie Hefeng and Ma Qingguo exploratoryly divided the organizational climate into five dimensions: innovation, fairness, support, interpersonal relations and employee identity. Good employee interaction, thereby strengthening communication between team members, a more active team atmosphere, and more conducive to knowledge sharing; employee participation in discussions is safer, and employees are more likely to generate creativity and innovation in an inclusive team atmosphere; among employees, employees Trust each other with the leader, then the shared knowledge is credible, and the team's innovation atmosphere will be more positive. This article divides the team atmosphere into three dimensions: interpersonal relationship, participation safety and trust

3.3 The moderating effect of team atmosphere

In previous researches on team innovation performance, team atmosphere has been a very important factor. The quality of the team atmosphere affects the enthusiasm of team members, which in turn affects the behavior of team members, and ultimately affects team performance. A positive team atmosphere will create a good working environment, inspire employees' deep recognition of the team, and devote more energy and time; a negative team atmosphere will make employees feel depressed, they will naturally reject work, and team performance will decline. In a team that focuses on knowledge management, the team improves its innovation performance through knowledge management, and a good team atmosphere will strengthen this influence. Therefore, the hypothesis is proposed:

H5 Team atmosphere has a positive moderating effect on the impact of knowledge socialization on team innovation performance

H6 The team atmosphere has a positive moderating effect on the impact of knowledge externalization on team innovation performance

H7 The team atmosphere has a positive moderating effect on the impact of knowledge integration on team innovation performance

H8 The team atmosphere has a positive moderating effect on the impact of knowledge internalization on team innovation performance

The research framework of this paper is as follows:

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Figure. 3 The research framework of this article

4. Research method

4.1 Research samples and data collection

Starting from March 1, 2019, through the form of questionnaire stars, validly filled in 82 copies within one month. The industry is mainly concentrated in household appliances and electronic products and machinery manufacturing. Most of the team size is more than 100 people. The R&D investment of the team is 5% to 15%, followed by 15% to 30%. Four of the teams have no R&D investment. In order to ensure the effectiveness of the research, the teams participating in the survey all involve team innovation, the data collection is reasonable, and the survey is representative.

4.2 Variable measurement

Using Likert's 5-level scale, 1 means "strongly disagree" and 5 means "strongly agree". Knowledge socialization, knowledge externalization, knowledge integration, knowledge internalization as four independent variables, each independent variable is designed with 4 questions, which are more comprehensive; team atmosphere is used as a moderating variable, and 3 questions are designed; team innovation Performance as a dependent variable covers three aspects and six questions are designed. At the same time, gender, education level and years of work have been added as three control variables.

5. Empirical analysis

5.1 Reliability and validity test

Apply SPSS25.0 to test the reliability and validity of each variable, and the results are shown in Table 1. The Cronbach Alpha value of each variable is greater

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than 0.9, indicating that the internal consistency of the scales is high and the reliability is good. The scale of this article refers to the theoretical knowledge and the maturity scale of previous studies, and its content validity is relatively reliable. The KMO value of each scale is greater than 0.7, and the validity is good.

Table 1 Reliability and validity analysis

Variable I	Item	Cronbach Alpha	KMO value
Knowledge socialization	1 I often have new ideas when I work	0.948	0.825
	2 I often get information from relevant departments of the team		
	3 I am willing to share knowledge, experience and self-insights with colleagues		
	4 The team has adopted the "old man brings newcomer" model		
Knowledge externalization	1 I can fully express my views and opinions, and can express them in the form of words, pictures, tables, etc.	0.968	0.838
	2When I disagree with my colleagues at work, I can give examples to express my views clearly		
	3 I am good at organizing and saving the experience and skills at work		
	4 The team has established a good experience promotion mechanism		
Knowledge integration	1 I will collect work-related data, information and integration to better complete the work	0.952	0.851
	2 I tend to use new knowledge to solve problems and improve working methods		
	3 The team has a relatively complete knowledge management platform and high application efficiency		
	4 Team leaders focus on collecting and protecting knowledge		
Internalization of knowledge	1I will improve my work knowledge, methods and skills in time and absorb	0.965	0.848
	2The team pays attention to knowledge construction and encourages employees to use new knowledge		
	3 The team consciously improves the work skills of employees, such as skills training		
	4I will improve my work ability through team knowledge building and skill training		
Innovation atmosphere	1 Our company employees often gather together to discuss the latest developments in the work	0.902	0.721
	2 Our company employees feel that it is easy to discuss their new views with any other members		
	3 Our company employees think it is beneficial to exchange views with other members		
Team innovation performance	1The team can often put forward new ideas to solve project problems	0.953	0.886
	2 The number of team patents and core technologies are large		
	3 The team can achieve better results by implementing innovative solutions		
	4The team dares to deal with high-challenging projects		
	5 The team is willing to carry out innovative work with members		
	6 It takes less time for the team to develop innovative solutions		

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5.2 Correlation analysis

Based on the survey results of the 82 sample data recovered, the correlation between the variables was analyzed using person correlation. Table 2 shows the mean, standard deviation and correlation coefficient matrix of each variable. It can be seen that the correlation coefficients of the four fields of knowledge socialization, knowledge externalization, knowledge integration and knowledge internalization are very high, and the correlation coefficients of team innovation performance and these four fields are relatively high. This shows that I am asking questions in the design scale. When there is no effective distinction between variables, the problem measurement is too vague. The only thing that can be seen is that the correlation coefficient of team atmosphere is lower than 0.7, which is within the normal range.

Table 2 Descriptive statistics table

variable	Knowledge socialization	Knowledge externalization	Knowledge integration	Internalization of knowledge	Innovation atmosphere	Team innovation performance	gender	education level	Working years
Knowledge socialization	1								
Knowledge externalization	.916**	1							
Knowledge integration	.911**	.940**	1						
Internalization of knowledge	.908**	.916**	.922**	1					
Innovation atmosphere	. .602**	.640**	.610**	.606**	1				
Team innovation performance	.839**	.837**	.826**	.806**	.624**	1			
gender	.382**	.375**	.368**	.328**	.413**	.365**	1		
education level	.325*	.317**	.306**	.295**	.432**	.316**	.393**	1	
Working years	.359**	.419**	.405**	.480**	.437**	.359*	.396**	.213	1
Mean	3.9074	3.9259	3.8580	3.9846	3.86585365853659	3.37195121951220	1.21	2.39	1.61
Standard deviation	1.08429	1.13223	1.12912	1.09569	.939689929447457	1.117358602798650	.561	.750	.813

5.3 Hypothetical test

Combine the models 2, 3, 4, and 5 in Table 3. Assume that H1, H2, H3, and H4 are supported. That is, the four fields of knowledge management have a significant positive impact on team innovation performance. However, according to models 10, 11, 12, and 13 the interaction terms are not significant, assuming H5, H6, H7, and H8 are not supported. It shows that the team atmosphere has no moderating effect on the influence of the four fields of knowledge management on team innovation performance.

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Table 3 Analysis of regression results

variable	Team innovation performance												
	Model 1	Model 2	Model 3	Model 4	Mode5	Model 6	Model 7	Model 8	Model 9	Model 10	Mode 11	Model 12	Model 13
gender	.175	.009	.036	.038	.107	-.004	.024	.022	.081	.039	.031	.032	.131
education level	.197	.044	.050	.061	.059	.006	.019	.020	.013	.062	.027	.033	.070
Years of work	.252*	.067	.002	.019	-.068	.030	-.020	-.013	-.094	.049	-.018	-.009	-.084
Knowledge socialization		.797***				.722***				.587***			
Knowledge externalization			.807***				.741***				.719***		
Knowledge integration				.785***				.706***				.674***	
Internalization of knowledge					.786***				.698***				.567***
Innovation atmosphere						.174*	.141	.181*	.203*	.056	.125	.156	.081
Knowledge socialization * team atmosphere										.208			
Knowledge externalization * team atmosphere											.031		
Knowledge integration*Team atmosphere												.048	
Knowledge internalization * team atmosphere													.211

6. Main research conclusions and failure analysisThis article

starts from the four fields of knowledge management. Through searching literature and information, it is found that although there are many articles on knowledge management, there are few researches on the impact of knowledge management on team innovation performance and how. At the same time, there are many articles researching team innovation performance. The theoretical basis for choosing team atmosphere as a moderating variable is to refer to previous literature. There are many papers researching team innovation performance. In the field of team research, team atmosphere is regarded as an important input variable that affects team performance. There are many papers on team innovation performance, but there are few papers on team atmosphere on team innovation performance. Therefore, this paper introduces team atmosphere as a moderating variable, which is innovative.

Because there is no predecessor's reference to the four field measurement problems of knowledge management, this article designs four measurement problems for each of the four fields based on the search materials and the literature according to their own understanding. However, the lack of reference to the maturity scale and the lack of deep understanding of the four fields of knowledge socialization, knowledge externalization, knowledge integration, and knowledge internalization have led to the fact that the correlation coefficients of the four of them are too high and not very good. distinguish. At the same time, it is found that

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these four fields have a positive and significant effect on team innovation performance, which shows that knowledge management is beneficial to team innovation, and the team atmosphere does not play a moderating role in the impact of these four fields on team innovation performance. The reason is the first: The measurement problems of the four fields of knowledge management are not mature enough, which indirectly leads to the insignificant adjustment effect of the team atmosphere; second: the measurement problem of the team atmosphere is not comprehensive enough. Although the previous scale is used for reference, it is not properly modified in conjunction with knowledge management; Third, although team atmosphere is an important indicator to measure team innovation performance, after knowledge management, the improvement of team innovation performance does not necessarily require the influence of team atmosphere. This may indicate that the team through knowledge management will significantly improve team innovation performance. Enough to illustrate the importance of knowledge management.

References

[1] Xie Hefeng, Ma Qingguo. The influence of organizational climate on employees' informal knowledge sharing [J]. Research in Science of Science, 2007 (02): 306-311.

[2] Xie Hefeng. Research on the Motivation of Organizational Climate on Informal Knowledge Sharing Behaviors among Enterprise Employees [J]. Research and Development Management, 2007 (02): 92-99.

[3] Wang Xingyuan, Zhu Qiang. Research on the impact mechanism of the support of the crowd-creation space on the innovation performance of the college student maker team [J]. Progress in Science and Technology, 2018, 35 (14): 128-134.

[4] Wang Xueyuan, Ma Weirui. Research on the impact of knowledge management on the performance of manufacturing enterprises [J]. Research in Science of Science, 2018, 36 (12): 2223-2232.

[5] Zhang Hualei. Research on the Mechanism of Cross-Border Activities of R&D Team on Team Innovation Performance [D]. Nankai University, 2014.

[6] Wei Lianda. Team leadership style

[7] Yin Hang, Zhang Yuhan, Liu Jiaxin. The impact of organizational distance and knowledge flow on breakthrough innovation of alliance enterprises [J]. Scientific Research Management, 2019, 40 (01): 22-31. Lattice, team sharing leadership and team innovation performance Relationship Research [D]. Xidian University, 2014.

[8] Liu Bing, Xie Fengtao, Meng Qingchun. An empirical analysis of the influence mechanism of team atmosphere on team performance [J]. China Soft Science, 2011 (11): 133-140.

[9] Fan Libo, Yang Jinhai, Shi Jiehui. Research on the Influence of Female Leadership Traits on Employee Performance——Based on the Mediation Effect of Team Atmosphere [J]. Journal of Nanjing Audit University, 2017, 14 (04): 34-43.

ISSN 2616-5767 Vol.3, Issue 6: 56-66, DOI: 10.25236/AJETS.2020.030607

[10] Wu Yingxuan, Cheng Xue, Yang Rui, Shi Jianjun. Research on the relationship between anti-order innovation and team innovation performance: the moderating effect of advocacy behavior and work autonomy [J]. Science of Science and Management of Science and Technology, 2018, 39 (12):142-155.
[11] Zhang Peng, Li Quanxi, Liu Yan, Zhang Jian. Research on the Knowledge Transformation Model of Supply Chain Enterprises Based on SECI Model [J]. Science and Technology Management Research, 2017, 37 (02): 147-150+214.
[12] Xue Yansong, Liu Yongqing. Research on Knowledge Transformation of Collaborative Innovation Centers in Universities with Industry Characteristics——Based on SECI Model [J]. Science and Technology Management Research, 2018, 38 (15): 111-119.
[13] Miao Rentao, Wang Bing, Liu Jun. High-performance work system and team innovation performance: a moderated mediation model [J]. Science and Technology Management Research, 2016, 36 (18): 110-115+131.
[14] Duan Jinyun, Xiao Junyi, Xia Xiaotong. Transformational leadership, team opinion atmosphere and team performance: the moderating effect of innovation atmosphere [J]. Scientific Research Management, 2017, 38 (04): 76-83.
[15] Zhong Jing, Deng Jie, Luo Jinlian. The impact of inclusive leadership on team performance and employee innovation performance: a moderated mediation model [J]. Science of Science and Management of Science and Technology, 2018, 39 (09): 137-148 .
[16] Yin Hang, Zhang Yuhan, Liu Jiaxin. The impact of organizational distance and knowledge flow on the breakthrough innovation of alliance enterprises [J]. Scientific Research Management, 2019, 40 (01): 22-31.