KNOWLEDGE SHARING AMONG SCIENTIFIC RESEARCH TEAMS IN CHINESE UNIVERSITIES BASED ON KGM

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Abstract

Knowledge sharing is one of the hot issues in the theoretical field and practical world at the current. It remains to be further studied on what level knowledge sharing among Chinese universities is at and what mechanism can affect it. This paper presents a model of conceptual and measurement of knowledge sharing among scientific research teams (KSASRT) in universities and its relevant influential factors with consideration of the special situation in China, aiming at developing an integrative understanding of the factors supporting Chinese scholars’ knowledge sharing behaviour based on the knowledge governance mechanism (KGM). Moreover, we analyze the mediating of sense of ownership, the typical mentality for the Chinese, between formal knowledge governance and knowledge sharing behaviour as well as informal knowledge governance and knowledge sharing behaviour. In addition, we consider the moderate impact of affiliation to discipline on the influence mechanism those knowledge governance variables on knowledge sharing due to the particular university environment. This study not only makes a useful contribution to the theoretical understanding of knowledge governance and knowledge sharing in Chinese universities, but also offers some interesting directions for further empirical research of higher education and scientific research institutions in China.

Keywords: Scientific research teams, Knowledge governance mechanism (KGM), Knowledge sharing among scientific research teams (KSASRT), Sense of ownership, Affiliation to discipline.
1 INTRODUCTION

Knowledge plays a significant role in knowledge-based economy, especially in innovative economy (Widad et al. 2013). Even small-sized enterprises in mature industries, threatened by increasing external competition, can create their unique advantage resources from the knowledge which seems ordinary (Rajiv & Dennis 2012). While there is a strong body of research into knowledge sharing in commercial environments or public sector organizations, research into knowledge sharing in universities is very limited (Roger et al. 2013). Universities provide scholars with a knowledge-intensive environment for creating and disseminating knowledge. Through cooperation with universities, enterprises can enhance their innovation ability and social units can learn more from campus teaching and training. In universities, scientific research teams are the crystallization of every team member’s expertise. As the underpinning force of universities innovation, their knowledge sharing level positively influence on universities’ innovation behaviour (Wang & Ji 2013). So how to improve knowledge sharing behaviour among scientific research teams in universities?

Many researchers have proved that knowledge sharing behaviour can be promoted through various knowledge management methods (Abhishek et al. 2006; Fey et al. 2008; De Clercq et al. 2013). However, some studies show that at least 1/3 of the related knowledge management methods failed. The knowledge warehouse, knowledge management system and internal knowledge network created by many enterprises turned out not very useful (Chua & Lam 2005). The reason lies in the failure to fully recognize the complexity and uniqueness of knowledge-based activities, obscuring the relations between knowledge and organization which in turn led to the ignorance of practical significance of the effective organization of knowledge procedure. Indeed, only related techniques on knowledge management are impractical. Knowledge-based activities need institutional arrangements which means using formal or informal organizational mechanisms or structures to coordinate the institutional arrangement of the related knowledge-based activities so as to optimizing the process of choose, utilize, transfer, share and create knowledge, namely, knowledge governance (Foss et al. 2010; Ren 2007). Therefore, this study aims at inspecting whether and how knowledge governance can affect knowledge sharing behaviour among the scientific research teams in universities.

There are many differences between Chinese and western culture and economic system. In China, sense of ownership is a typical mentality for the Chinese. In universities where higher education is spread and received, most of the members are the ones who have the highest education background, so they have more spiritual pursuits and stronger sense of ownership than normal people do (Zhang et al. 2008). One’s behaviour is dominated by his spiritual strength, and such spiritual strength can come from some certain motivational system and deliberate cultivation. So we assume that knowledge governance mechanism can affect the behaviour of knowledge sharing through the cultivation of ownership. However, knowledge sharing behaviour of members in scientific research teams does not only rely on knowledge governance, but also on team members’ affiliation to discipline. These suggest that further exploration on the mediation effect of sense of ownership between knowledge governance and knowledge sharing and the moderation effect of scientific research members’ affiliation to discipline might reflect their mutual effect more objectively.

Based on these, we focused on the influence mechanism of knowledge governance promoting personal knowledge sharing behaviors among scientific research teams in Chinese universities, and address three key issues: (1) Which influences formal and informal knowledge governance mechanism have on the knowledge sharing behaviors; (2) The mediation role of sense of ownership in the specific situation of China; (3) The moderating effect of disciplinary belongings.
2 THEORETICAL BASIS AND RESEARCH HYPOTHESIS

2.1 Scientific Research Teams’ Knowledge Sharing in Universities

Universities are not like other enterprises and they have different environments, therefore, they need different managerial theories. From the perspective of knowledge sharing, the key characteristic of scientific research teams in universities is knowledge-intensive, while except some knowledge-intensive enterprises such as professional service companies, normal enterprises don’t have this one(Von & Andre 2010). As innovation is the essential attribute of scientific research teams in universities, knowledge is the core resources of the team and knowledge sharing is regarded as the foundation of scientific research innovation. Teams have a special focus on the absorption, digestion, development and recreation of the existing knowledge and skills. Tippins (2003) believes that the nature of university scholars’ behaviors is individualistic. Scientific research team can realize scholars’ self-management on their learning and knowledge sharing and turn their individual knowledge into team knowledge by adjusting the team structure and building collaborative atmosphere. And because of the uniqueness of the organizational structure of the scientific research teams in universities, most of the members are the ones who are equipped with the highest level of education background, and they have more spiritual pursuits and stronger sense of ownership than normal people do. Though material motivation remain one of the major method for promoting the knowledge sharing among scientific research teams, the role of spiritual motivation is becoming more and more obvious. The so-called sense of ownership, the typical spiritual motivation for the Chinese, may promote the knowledge sharing behaviour in a very important way in Chinese universities. Lee (2007) demonstrated the heterogeneity and complexity, that is to say, university culture is determined by both institutional culture and disciplinary culture. Furthermore, some scholars found that compared with organizational affiliation, university researchers have a better sense of disciplinary affiliation (Cronin 2000). This means that there is a strong tie between scholars and their discipline, which may lead to special knowledge sharing situation in scientific research teams. Given the numerous characteristics of scientific research teams in universities, the knowledge sharing activities in universities is usually complicated, and theories developed from other enterprises’ knowledge sharing research centers might not apply for universities and need to be further testified.

2.2 Knowledge Governance and Knowledge Sharing

The knowledge governance (KG) theory covers a wide range of theoretical basis such as organizational economy, organizational behavior and new economic sociology. Different scholars have different definitions on knowledge governance. Grandori (2001) believe that knowledge governance is the governance of the process of knowledge exchange, transfer and sharing according to the enterprise theory and enterprise knowledge theory, in another word, coordination and control. From the perspective of social anthropology, Choi et al. (2005) consider knowledge governance as the governance structure which influences the knowledge transfer and flows, including trade, power, and bestowal. Foss et al. (2010) defines knowledge governance from the perspective of organizational behaviors, namely, choosing the appropriate formal and informal organizational structure and mechanism to optimize the process of knowledge creation, transfer and sharing. Foss’ definition is a whole new light to study knowledge activities and analyze knowledge process mainly from incentive and policy, which is suitable for the recent university scholars’ knowledge sharing habits. So this paper adopt Foss’s definition of knowledge governance, which includes formal knowledge governance (FKG) and informal knowledge governance (IKG) (Foss et al. 2010). FKG refers to organizational structures, rewarding systems, work designs and leadership. IKG refers to networking, corporate culture, management style, organizational justice and administrative support (Cao & Xiang 2014). In general, KG favors incentives guidance from systemic level and the cultivation of organizational atmosphere. Based on the revised social impact theory, Jin et al. (2013) demonstrated that
organizational incentive indirectly influences organizational members’ intention for knowledge sharing. And Organizational culture indirectly influences members’ attitude towards knowledge sharing and further influences their intention for knowledge sharing (Jin et al. 2013). Frank (2011) believes that because of its lack of flexibility, openness of information sharing mechanisms and communication channels, the traditional organizational structure is not conducive to team knowledge sharing. Team leaders should pay attention to changes in the organization structure so as to adapt to external environment changes, and eventually effectively promote organizational learning and knowledge sharing process (Frank & Andreas 2011). Li (2010) empirically demonstrated that fair organizational atmosphere not only has a direct positive impact on knowledge sharing behaviors, but also indirectly impacts knowledge sharing behaviors through impacting outcome expectations. In scientific research teams, if leaders attach great importance to FKG such as encourage the individual behaviors of their subordinates, set the reward to the appropriate behavior, and IKG, for instance, take difficult times in scientific research work as an opportunity for learning, and encourage cooperation and coordination among team members, then there’s a higher possibility for enhancing knowledge sharing (Li et al. 2010). Therefore, we have the following hypotheses:

Hypothesis 1: Formal knowledge governance positively influence on knowledge sharing behavior among scientific research teams in Chinese universities.

Hypothesis 2: Informal knowledge governance positively influence on knowledge sharing behavior among scientific research teams in Chinese universities.

2.3 Sense of Ownership

The nature of sense of ownership is the high level of autonomy of organizational members which results in members’ initiative participation and team spirit. It leads to their trust, care and love to the organization, as well as strong cohesion and harmonious interpersonal relationship in organization (Wu 2001). Scholars indicated that even if the organization has the high cohesive force, it also must rely on managers to actively guide employees to produce high production efficiency. On the one hand, FKG favors incentives guidance from systemic level; on the other, IKG tends to cultivate the organizational atmosphere. Based on the revised knowledge governance theory, we assume that there may be positive correlation between FKG, IKG and sense of ownership.

In China, sense of ownership is a typical mentality for the Chinese. In universities where higher education is spread and received, most of the members are the ones who have the highest education background, so they have more spiritual pursuits and stronger sense of ownership than normal people do (Zhang et al. 2008). In terms of scientific research team, sense of ownership is a kind of driving force which benefits team work and efficiency. It makes the scientific research members performance far exceeds the teams’ formal requirements, and act so creatively and with enthusiasm on their own. When researchers in universities have strong sense of ownership, they may be more active to share knowledge with team members. From what has been discussed above, the sense of ownership researchers have may positively influence on knowledge sharing behavior.

Nevertheless, sense of ownership is not the endogenous nature of the individual, but the consequence of the interaction between individuals and the external environment. Scientific research personnel's own virtue and morality differs because of the dissimilar organizational structure, incentive system, work design, team culture, team atmosphere, etc, namely, different knowledge governance mechanism. As a result, a huge difference exits in scientific research team members’ sense of ownership in Chinese universities. The more effective of FKG and IKG is, the easier to cultivate the sense of ownership among scientific research teams in Chinese universities, which further promotes the knowledge sharing behavior. Based on the above analysis, we have the following hypotheses:

Hypothesis 3: Sense of ownership plays a mediating role between formal knowledge governance and knowledge sharing behavior among scientific research teams in Chinese universities.
Hypothesis 4: Sense of ownership plays a mediating role between informal knowledge governance and knowledge sharing behavior among scientific research teams in Chinese universities.

2.4 Affiliation to Discipline

The study of scientific research team members’ affiliation to discipline in Chinese universities is very limited (Lin 2009). Disciplinary affiliation or disciplinary commitment is the broadening of the domain within which organizational commitment is studied. To take the university research team as our group, we define the affiliation to discipline based on the organizational commitment theory and refer to the affective commitment dimension of organizational commitment. It’s a kind of emotional attachment and value identity, which means the strength that team researchers identify and participate in a certain disciplinary activity. Many researchers studying organizational commitment and knowledge sharing behavior have found that organizational commitment positively influence on individual knowledge sharing behavior (Donald 2003; Guan & Gao 2007;). And Cronin (2000) have proved that scholars in universities tend to have the loyalty to discipline rather than organization, pointing out that the emotional attachment, identity and loyalty to scientific research career among scholars mainly comes from their deep feelings to their study fields and discipline (Cronin 2000). Hence, we believe that when members among scientific research teams have the affiliation to their discipline, they are more willing to share knowledge to others. Moreover, affiliation to discipline of scholars may contribute to the communication to each other and the cooperation to accomplish scientific research task as a team as well as the strengthening of academic mission feelings, the identity of their own academic contribution and the creating favorable academic atmosphere. All of these help to knowledge governance performance and then improve knowledge sharing. So while affiliation to discipline may be a significant factor to knowledge sharing, it may also moderate the process of knowledge governance to knowledge sharing. Based on the above analysis, we hypothesize:

Hypothesis 5: Affiliation to discipline among scientific research team members positively moderate the process of formal knowledge governance to knowledge sharing behavior in China.

Hypothesis 6: Affiliation to discipline among scientific research team members positively moderate the process of informal knowledge governance to knowledge sharing behavior in China.

![Conceptual model of KSASRT](image-url)
Therefore, this paper presents the conceptual model of knowledge sharing among scientific research teams (KSASRT). Figure 1 depicts our research model.

3 MEASUREMENT

The measurement of independent variables, dependent variable, mediator variables and moderator variables are listed as Table 1.

Items used in our research were adapted from the prior literature. Formal knowledge management was measured by three items and informal knowledge management was measured by four items adapted from Cao & Xiang (2014). Sense of ownership was measured by four items based on Wu (2001). Affiliation to discipline was measured by three items adapted from Meyer et al. (1993). Knowledge sharing behavior was measured by three items adapted from Bock et al. (2005).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Item</th>
<th>Construct</th>
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<tbody>
<tr>
<td>Formal Knowledge Governance (FKG)</td>
<td>FKG1. I have a lot of opportunities to cooperate with other team members to complete the scientific research task.</td>
<td>Cao &amp; Xiang 2014</td>
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<td></td>
<td>FKG2. In the research, my effort can get the team’s approval.</td>
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<tr>
<td></td>
<td>FKG3. I often cooperate with other team members to complete the scientific research task in the form of a team.</td>
<td></td>
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<tr>
<td>Informal Knowledge Governance (IKG)</td>
<td>IKG1. I think my scientific research team has a good atmosphere of communication.</td>
<td>Cao &amp; Xiang 2014</td>
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<td></td>
<td>IKG2. I think my scientific research team has an open management style.</td>
<td></td>
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<td></td>
<td>IKG3. I think everyone feels fairness in our scientific research team.</td>
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<tr>
<td></td>
<td>IKG4. My team leaders often create opportunities for us to communicate with each other.</td>
<td></td>
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<tr>
<td>Sense of Ownership (SOO)</td>
<td>SOO1. I have a kind of indifferent and irresponsible attitude to my team. (R)</td>
<td>Wu 2001</td>
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<td></td>
<td>SOO2. My personal goals are consistent with my team goals.</td>
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<td></td>
<td>SOO3. I can feel the sense of belonging, self-worth, a promising future and warm in my team.</td>
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<td></td>
<td>SOO4. My behavior on scientific research is motivated by both material incentive from the team and personal spiritual pursuits.</td>
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<tr>
<td>Affiliation to Discipline (ATD)</td>
<td>ATD1. I regret having chosen my present discipline as my study direction. (R)</td>
<td>Meyer et al.1993</td>
</tr>
<tr>
<td></td>
<td>ATD2. I am proud to do the research on my present discipline.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATD3. I am enthusiastic about my present discipline.</td>
<td></td>
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<tr>
<td>Knowledge Sharing Behaviour (KSB)</td>
<td>KSB1. When I learned something new from research and study, I shared it with my team members forwardly.</td>
<td>Bock et al.2005</td>
</tr>
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<td></td>
<td>KSB2. When team members consulted me on their own initiative, I shared everything I know including scientific research dynamic, the academic frontier, academic report information and other resources.</td>
<td></td>
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<td></td>
<td>KSB3. I shared my research experiences with my team members.</td>
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<td></td>
<td>KSB4. For something hard to describe verbally, I shared it by teaching or training in person.</td>
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<td></td>
<td>KSB5. I expressed my views and suggestions frequently in our seminar.</td>
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Table 1. Measurement model of KSASRT
4 CONCLUSIONS

This paper aims at providing an integrated understanding of knowledge governance and knowledge sharing. To theoretically and empirically explore the relations of knowledge sharing and knowledge governance, the mediation role of sense of ownership and the moderating role of affiliation to discipline, we have presented the KSASRT model, as well as the measurement of the model. However, what we have done is just the beginning toward the study. In the near future, we will design the questionnaire based on the measurement model, and conduct a survey on a relatively large scale in Chinese universities to gather the data. Next, we will also analyze the reliability and validity of the measurement model and then test the hypotheses using AMOS and SPSS. After summarizing the results, we can have a discussion on it and draw some conclusions. All above is needed to mitigate the empirical research gap and examine whether the research model is suitable for Chinese scientific research teams.

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