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Research Report

The impact of connecting with Professional Virtual Forum, team member and external person on R&D employee creativity

Chaoying Tang *

Management School of University of Chinese Academy of Sciences, Qin nian gong yu 7-208, Zhong guan cun dong lu 80#, Beijing 100190, China

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ABSTRACT

Accessing external knowledge is an important part of work for Research and Development (R&D) employees to get high creative performance. Currently, Professional Virtual Forum (PVF) in internet is becoming an important virtual knowledge source for R&D employees. However, up to now the impact of R&D employees' connect with PVF on their creativity still waits to be explored. Furthermore, the interactive effects of connect with PVF and person-to-person knowledge sources on creativity are not clear. This paper empirically studied the 163 R&D employees came from 16 companies in China, and the results turned out that the R&D employees' frequency of connect with PVF and intra-team, as well as with external person all significantly improved their creativity. Frequency of connect with PVF moderated the relationship between centrality of intra-team knowledge network and employee creativity, in such that when the frequency of connect with PVF was higher, the positive influence of centrality of intra-team knowledge network on employee creativity was also higher. Suggestions for future study on PVF and creativity are discussed.

1. Introduction

Creativity means the generation of novel and useful ideas (Amabile, 1996). With the growing globalization of the economy, the external environment of enterprises is getting increasingly competitive and creativity has become a core organizational competency. Correspondingly organizational creativity has established itself as an research field (Zhou & Shalley, 2011; Mumford, 2011), among them employee creativity is an important topic (Amabile, 1997). Creativity is a complex concept and it is the result of personality, cognitive ability, process and environment (Kozbelt, Beghetto, & Runco, 2010; Meusburger, Funke, & Wunder, 2009; Puccio, Murdock, & Mance, 2005; Runco & Chand, 1995). Its concept construct and the assessment method are still under theoretical controversy, especially in psychological field (Puccio & Murdock, 1999). However, this does not inhibit the increasing empirical field studies on organizational creativity (e.g., Zhou & George, 2001; Zhou & Shalley, 2011; Mumford, 2011). Unlike activity-based creativity assessment in experimental study, such as asses divergent thinking through performance of unusual uses task, artistic tasks and problem solving tasks, etc. (Amabile, 1996; Baer, 1993; Kaufman, Cole, & Baer, 2009; Puccio & Murdock, 1999). In the field studies, organizational creativity researchers collect data of creativity from employees and supervisors through questionnaires, or patent, publishing paper and new product (Amabile, 1996). Some measurements have been widely used in empirical study, includes Oldham and Cummings's 3-item scale (1996) and others (e.g., Scott & Bruce, 1994; Tierney, Farmer, & Graen, 1999; Madjar, Greenberg, & Chen, 2011; Zhou & George, 2001). These measurements mainly evaluate the creative performance or outcome.

Creative performance relates with the knowledge and knowledge assessing. Knowledge is important factor of creativity (Ward, 1994). Domain-relevant knowledge will enhance creative performance (Mumford & Gustafson, 1988). In order to become a distinguished exporter in a certain domain, more than 10 years learning is necessary. Experimental study found that knowledge exchanging enhanced creative outcome when group members paying attention to the ideas developed and having the opportunity to reflect on a given idea (Paulus & Yang, 2000). In organizational creativity study, the significant influence of knowledge on employee creativity has also been recognized (Ford, 1996). Knowledge from different areas will help creativity (Ziebro & Northcraft, 2009). New product development often depends on the combination of different knowledge (Yayavaram & Ahuja, 2008). The sources of knowledge such as team members (Monge, Cozzens, & Contractor, 1992), customers (Von Hippel, 1988), suppliers (Leonard, 1998), team members and external person help their creativity (Cross & Cummings, 2004; Reagans & McEvily, 2003; Soo, Devinney, & Midgley, 2007; Sparrowe, Liden,

* Tel.: +86 010 82680677.
E-mail address: tcy@ucas.ac.cn

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Wayne, & Kraimer, 2001; Tsai, 2001), and even family member and friends (Perry-Smith, 2006; Perry-Smith & Shalley, 2003; Zhou & Shalley, 2011, P289) help spark new thoughts and result in a greater set of options for work-related problems, thus are helpful for employee creativity. And knowledge management has been regarded as an important task of organization creativity management (Kazanjian & Drazin, 2012).

In the case of Research and Development (R&D) employee creativity study, the role of knowledge on creativity is also noticed. Among varied kinds of creative works, such as art and science, R&D work is knowledge-intensive and aims to solve technical problems. Accessing to external information or knowledge influenced R&D employee's creativity (Sparrowe et al., 2001; Woodman, Sawyer, & Griffin, 1993). R&D teams' internal and external group communication positively related to their creative performance, such as patents and publishing (Payne, 1990). Surprisingly, current studies about knowledge accessing and creativity neglect the virtual and on-line work knowledge sources (Brown & Dugiud, 1991; Ford, 1996; Shalley & Perry-Smith, 2001). Among kinds of internet based knowledge sources, Professional Virtual Forum (PVF) is an important and popular knowledge source for R&D employees due to its encouragement on anonymous and two-way discussions about technical issues. In 1970s, R&D employees' communication habits were found depend much on the workplace allocation (Allen, 1970). The Allen's classical finding was that informal relations and physical location were shown to be important determinants for R&D employees' knowledge network in laboratories (Allen, 1970). Decades past, internet might change R&D employees' communication behaviors. It is necessary to study R&D employees' up-dated knowledge accessing behavior and the impact of R&D employees' connect with PVF on their creativity. Up to now less study addresses this issue that connecting with PVF will influence employee creativity.

Hence, this paper aims to fill this gap by introducing R&D employees' connect with PVF and its impact on their creativity. Furthermore the moderating effects of connect with PVF and connect with other two kinds of traditional knowledge sources (team members and external person) on R&D employee creativity will be tested. The research model of this study was presented in Fig. 1.

2. Connect with knowledge sources and R&D employee creativity

2.1. Connect with person

Team has been widely used as a basic organizational unit of R&D work in modern organizations. Team members share knowledge and discuss with each other in the creative process, which gives the birth of knowledge networks. In the knowledge network, team members are the actors and the information or knowledge shared is the tie of the network. Employees' intra-team knowledge accessing behavior can be identified by the characteristics of their "Knowledge Network Centrality". Centrality refers to actors' positions in a network relative to others and in relation to the complete network (Freeman, 1979). Higher central person connected with more actors and had higher creativity (Inkpen & Tsang, 2005; Tsai, 2001; Tsai & Ghoshal, 1998). Central person had more opportunity to acquire other person's ideas and knowledge than team member in peripheral position (Cross & Cummings, 2004; Perry-Smith & Shalley, 2003), and was more able to accumulate knowledge about task-related problems and workable solutions (Baldwin, Bedell, & Johnson, 1997; Mehra, Kilduff, & Brass, 2001) because knowledge was partially developed through interactions (Nahapiet & Ghoshal, 1998). Central person might take advantage from this position as a valued resource for future exchanges with other team members, and had more relationships to draw upon in obtaining resources and so was less dependent on any single individual (Cook & Emerson, 1978). Central person was likely to be perceived as having higher status (Ibarra, 1992; Ibarra & Andrews, 1993; Lincoln & Miller, 1979), freedom and power (Krackhardt, 1990) by the rest team members and was better prepared for taking risk (Ibarra & Andrews, 1993; Lincoln & Miller, 1979; Perry-Smith, 2006). That was the critical driver of creativity (Woodman et al., 1993).

External person is also a potential source of technical information and knowledge. Interaction with diversified person benefited individual's creativity (Amabile, 1996). Connecting with external person promoted access and exposured to more pockets of information (Baer, 2010) or diversified knowledge (Han, Han, & Brass, 2013), which facilitated individual's remote and divergent thinking (Mumford & Gustafson, 1988). Even connecting with friends can improve individual's creativity (Perry-Smith, 2006; Sutton & Hargadon, 1996). Cross-bounder connection helped access to different domains' knowledge (Cross & Cummings, 2004). Accessing to external ideas and information enhanced R&D creativity (Payne, 1990; Sparrowe et al., 2001; Woodman et al., 1993). In the age of open innovation, person come from customer companies, supplier companies, cooperative companies, competitive companies etc, might be the sources of work related knowledge for R&D employees (Enkel, Gassmann, & Chesbrough, 2009).

2.2. Connect with on-line PVF

With the development of computer technology, internet has become an efficient, convenient and inexpensive approach of accessing information or knowledge (Jeffres, Neuendorf, & Atkin, 2012; Molnar & Sharda, 1996). Compared with traditional person-to-person approach, knowledge accessing through internet has its advantage (Alavi & Leidner, 1999). Internet generates virtual places for professional person to share their expertise knowledge, which in turn bring the birth of virtual professional community. Internet is better for communicating the solving strategy of complex technical problems (Lin, 2006), and can help us seeking information or knowledge belongs to different domains (Jeffres

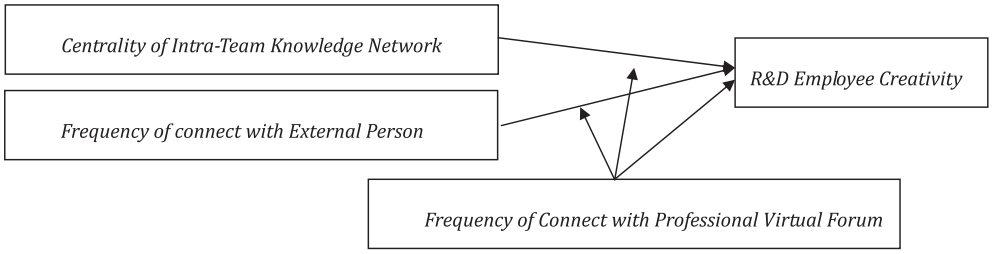

Fig. 1. Research model.