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THE RELATIONSHIP BETWEEN PERSONAL COGNITION, SOCIAL CONTEXT,
AND KNOWLEDGE SHARING IN GLOBAL COMMUNITIES OF PRACTICE

BY

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DISSERTATION

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Abstract

The purpose of this study was to identify the structural pathways of personal cognition and social context as they influence knowledge sharing behaviors in communities of practice. Based on the existing literature, ten hypotheses and a conceptual model built on the basis of the social cognitive theory were developed regarding the interrelationships of the five constructs: self-efficacy for knowledge sharing, outcome expectations, sense of community, leadership of a community, and knowledge sharing.

The data were collected through an online questionnaire from the employees who have participated in communities of practice in a *Fortune* 100 corporation. A total of 438 usable questionnaires were collected. Overall, three analyses were conducted in order to prove the given hypotheses: (a) hypothesized measurement model fit, (b) relational and influential associations among the constructs, and (c) structural equation model analysis (SEM). In addition, open-ended responses were analyzed.

The results presented that (a) hypothesized measurement models were valid and reliable, (b) personal cognitive factors, self-efficacy and outcome expectations for knowledge sharing, were found to be significant predictors of community members' sense of community and knowledge sharing behaviors, (c) sense of community had the most significant impact on the knowledge sharing, (d) as the perceived social context, sense of community mediated the effects of personal cognition on knowledge sharing behaviors, and (e) personal cognition and social context jointly contributed to knowledge sharing. In brief, all of the hypotheses were positively supported. A conclusive summary is provided along with contributive discussion. Implications and contributions to HRD researchers and practitioners are discussed, and recommendations are provided.

To My Dear Father and Mother

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Chapter 1

Introduction

In this chapter, the background for the increasing interest in knowledge sharing in organizations is discussed, followed by the problem statement and the purpose of the study, the significance and limitations of the study, and finally, definitions of the key terms of this study.

Background to the Problem

The world is flat as Friedman (2006) captures the dynamics of today's business world in his recent book titled *The World is Flat*. The exponential technical advances of the digital revolution have made it possible to do business instantaneously with billions of people across the planet in this "flat," that is, "connected" world. The flattening of the world makes it possible to connect all the knowledge centers on the planet in a single global network, thus ushering in prosperity and innovation. At the same time, the flattening of the world also means that organizations are facing fiercer competition globally.

In this increasingly competitive global environment, the notion of knowledge as a source of organizational growth and advantage has long been recognized, with knowledge being regarded as the most critical resource of organizations and economies (Davenport & Prusak, 1998; Ipe, 2003; Nonaka & Toyama, 2003; 2007). It is the only renewable resource that an organization is able to capture, manipulate, and create to its advantage (Huseman & Goodman, 1999). Thus, the capability to create and utilize knowledge is considered the most critical competence; accordingly, the ability to learn

and manage the learning process is key success factors for organizations (Grace & Butler, 2005).

Organizations around the world echo this emphasis on the importance of knowledge; that is, to learn and apply this knowledge as the work is performed may be the only sustainable source of competitive advantage (Liedtka, 1999). Deeply rooted in this notion, organizations strive to capitalize on their knowledge through effective knowledge management (KM) strategies and practices. A recent, recurring saying in the field of knowledge management is that continuous reinvention of the organization through learning is a key feature of KM (Alavi & Leidner, 2001; Burton & Schwen, 2003; Furlong & Johnson, 2003). This phenomenon has prompted the increased use of informal, semistructured groups of individuals organized around a particular discipline or set of ideas (Lesser & Storck, 2004; O'Mahoney & Ferraro, 2007). Such groups have become known as a community of practice (CoP), a group of people informally bound together by shared interests, expertise, and passion for a joint enterprise (Wenger & Snyder, 2000, p. 139), and whose members regularly engage in knowledge sharing and are seen to foster collaboration and help build relationships (Wenger, McDermott, & Snyder, 2002; Wenger, 1998).

As organizations grow in size, geographical scope, and complexity, knowledge sharing is crucial because it helps organizations promote best practices and reduce redundant learning cycles (Hanse, 2002; McDermott & O'Dell, 2001). Thus, it is increasingly apparent that sponsorship and support of CoPs, a vehicle for collective intelligence and innovative initiatives in organizations, can eventually improve organizational performance (Ardichvilli, 2008; Malone, 2004; Vestal, 2006).

Whereas numerous information and communication systems have been developed to support such knowledge exchanges, practical applications have shown that technology alone cannot ensure that knowledge will indeed be exchanged (Garavelli, Gorgoglione, & Scozzi, 2002). Researchers and practitioners in the field of Human Resource Development (HRD) and KM alike have argued that culture and other human variables constitute key success factors such as motivations and goals (Kimble & Hildreth, 2005; Lu, Lueng, & Koh, 2006; Probst & Borzillo, 2008). However, it is not clear what specific variables of individuals are at play on knowledge sharing, or what organizational or management practices can affect those variables. Although scholars have asserted that a more integrative perspective of the knowledge-sharing process will benefit theories and practices in knowledge sharing, little empirical research has examined the factors influencing individual members' knowledge-sharing behaviors in this specific form of intra-organizational network, community of practice. To leverage the potential of these communities, organizations must understand the mechanisms underpinning individuals' decisions to share knowledge and expertise within online communities of practice.

This study examined whether the personal cognition and social contextual factors of members of CoPs are related to their knowledge-sharing behaviors and investigated whether the perceived social context, sense of community mediate the impact of personal cognitive factors.

Problem Statement

This study addressed (a) the gap in our knowledge of social variables within communities, (b) the lack of empirical examination of the social context for knowledge sharing within online communities in the extant literature and (c) the need for the study

with an integrative view of the perceived social context and its relationship with personal cognitive factors for knowledge sharing.

The first problem this study addressed was a gap in our knowledge about the social variables in virtual knowledge sharing. Much research has been focusing on interpersonal relationships, mainly addressing the peer relationships among members of a community (Bok & Kim, 2002; Ridings, Gefen, & Arinze, 2002; Wasko & Faraj, 2000), but few studies have considered the relationship between a leader and member(s) in depicting the social relationships within communities. That is, the role of leadership of a community was overlooked in defining and examining the social relationships in the current community literature.

In addition, the few empirical studies that investigated the social relationships within communities such as trust and reciprocity did not pay much attention to how social factors are at interplay with the dimensions of the relation in a community: mutual engagement, joint enterprise, and shared repertoire (Wenger, 1998). The social factors embedded in these essential dimensions of the relation within a community are constantly regenerated and recontextualized through interactions (Wenger et al., 2002), thus forming the practice of a community and a sense of community. As a multi-faced concept, sense of community encompasses not only the interpersonal relationships among members of a community but it also includes the components of assessment regarding the fulfillment of members' needs and interactive influences among people and a community (McMillan & Chavis, 1986; Perkins, Florin, Rich, Wandersman, & Chavis, 1990; Rovai, 2002). Thus, this study proposes that a social relationship in a community is not a uni-dimensional factor but a multi-dimensional variable including leadership of a community and sense of

community. Understanding the holistic perspective of the social variables within communities would provide useful information in building, facilitating, and enhancing the use of communities for knowledge sharing.

The second was a lack in the literature of empirical examination of the social context for knowledge sharing within online communities of practice. Although the importance of the social context on knowledge sharing in face-to-face environments has received much attention in the literature (Abrams, Cross, Lesser & Levin, 2003; Ipe, 2003), there has been little empirical research regarding the influence of social context developed within virtual communities. Given that the primary purpose of a CoP is to share knowledge among members with shared interests, topics, and problems, the social fabric of a CoP has been recognized as a critical element for active knowledge sharing (Inkpen & Tsang, 2005; Levin & Cross, 2004; Wasko & Faraj, 2000; Wenger, 1998).

In addition, as virtual knowledge sharing involves less social cues than face-to-face communication, it becomes more crucial for participants to perceive the context as secure and trustful that enables knowledge sharing to occur. The social context, based on the theory of context (Schutz, 1967), is an individual construct and emerges as an individual encounters a situation (Augier, Shariq, & Vendelo, 2001). In other words, individuals interpret a situation that results in the emergence of a context and leads to social actions on the part of the individual. Social activities are always situated in a context and yield a contextualized activity (Collis & Margaryan, 2004; Kutti, 1996). The salience of proximal context is becoming increasingly apparent when it comes to online communities of practice. As most of the activities occur virtually in each community space of the system, individuals are informally as well as contextually bound by a

common interest and goals in knowledge sharing and by applying common practices.

Hence, understanding how the social context emerges and transforms, and what the role of the perceived social context in knowledge sharing is, can provide important clues in designing interventions for supporting knowledge sharing across the organization.

Despite the premise, previous research has not paid much attention to how individuals intuitively and cognitively perceive and learn about the context in which all the knowledge-sharing activities occur and how these influence their involvement in community activities, let alone as drivers for members to engage in knowledge sharing. In addition, most investigations about communities of practice have resulted in untested conceptual and theoretical models. That is, the research has largely been based on anecdotal evidence, reflected by case studies focusing on “best practices” or “lessons learned.” There is a need to investigate to what extent the perceived social context would really influence knowledge sharing behaviors in online communities.

Third, there is a lack of an integrated perspective of community members’ knowledge sharing behaviors in the extant literature. It is expected there are numerous reasons or rationales individuals could have for sharing their knowledge virtually with others through online CoPs (Poell & Van der Krogt, 2003); however, the mechanisms have yet to be fully investigated. One possible explanation for that might be because most of the studies did not take any theoretical framework into consideration. Prior studies related to virtual knowledge sharing have focused on community members’ internal factors such as motivation and self-esteem (Ardichvilli, Page, & Wentling, 2003; Wasko & Faraj, 2000), and external factors such as organizational culture (Karlsen &

Gottschalk, 2004), reward systems (Bok & Kim, 2002), or ease of technology usage (Wasko & Faraj, 2005).

Recently, a few scholars attempted to better understand the drivers of knowledge sharing in virtual communities by adopting the social network theory (Chiu, Hsu, Wang, 2006; Wasko & Faraj, 2005). The social network perspective identified informal structure of knowledge flows between members, but was not helpful to understand attributes of identity, meaning, or participation (Handley, Sturdy, Fincham, & Clark, 2006; Wenger, 1998) and seems to fail to explain the cognitive aspects of behaviors as well as the landscape of understanding.

According to the social cognitive theory, a person's behavior is partially shaped and controlled by the influences of social network and the person's cognition (Bandura, 1997). Considering that individuals are the main actors in knowledge sharing and that knowledge sharing is voluntary act of behaviors taking place in socially interactive environments, community members' knowledge sharing behaviors are expected to be determined by the influence of both personal cognitive and social factors. Thus, the question scholars have attempted to answer since the advent of CoP, "Why do individuals spend their valuable time and effort on sharing knowledge with others?," should be addressed from the perspectives of both personal cognition and social influence. The social cognitive framework offered here is one way to diagnose both external and internal components that combine to impact knowledge sharing behaviors in virtual communities. By adopting this integrated perspective, the current study investigated how members perceive the dynamic context of their communities and how these factors; coupled with personal cognition, influence their knowledge-sharing behaviors within communities.

Purpose of the Study

The main purpose of this study was to examine the relationships among personal cognitive factors, social contextual factors within a community, and knowledge-sharing behaviors in online communities of practice (CoPs). Specifically, this study investigated the relationships of (a) self-efficacy, (b) outcome expectation, (c) sense of community, (d) leadership of a community, and (e) knowledge-sharing behaviors in online communities of practice.

Research Questions

This study was based on the integrative view of knowledge sharing and online communities of practice that emphasizes both personal and social contextual factors. The overarching research question was, “To what extent do personal cognition and social contextual factors in communities influence online knowledge sharing?” The following research questions guided this study. These questions emanated from the proposed conceptual model.

Self-Efficacy

1. Does community members’ self-efficacy have a positive impact on sense of community?
2. Does community members’ self-efficacy have a positive impact on knowledge sharing?

Outcome Expectation

3. Does community members’ outcome expectation positively impact sense of community?
4. Does community members’ outcome expectation positively impact knowledge sharing?

Leadership of a Community

5. Does community members' perceived leadership of a community positively impact sense of community?
6. Does community members' perceived leadership of a community positively impact knowledge sharing?

Sense of Community

7. Does community members' sense of community have a positive impact on knowledge sharing?
8. Does community members' sense of community mediate the relationship between self-efficacy and knowledge sharing?
9. Does community members' sense of community mediate the relationship between outcome expectation and knowledge sharing?
10. Does community members' sense of community mediate the relationship between the perceived leadership of a community and knowledge sharing?

Theoretical Framework

Bandura's social cognitive theory provided the theoretical grounds that guided this research. Social cognitive theory defines human behavior as a triadic, dynamic, and reciprocal interaction of personal factors, behavior, and the environment. These components continuously influence each other and an individual's behavior is uniquely determined by each of these factors (Bandura, 1997; Deluga, 1998).

According to this approach, the two major personal cognitive forces guiding behavior are self-efficacy and outcome expectations. Self-efficacy refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Outcome expectations refer to an individual's belief that task accomplishment leads to a possible outcome (Compeau & Higgins, 1999). An extensive line of research by Bandura and many others have demonstrated that a person's inclination to engage in a specific course of action is heavily influenced by the person's

self-efficacy (Bandura, 1997; Gist & Mitchell, 1992). Social psychologists have found a relation between self-efficacy and behavioral results in a number of applied areas (Bandura, 1997). Lin (2007) also argues that knowledge self-efficacy is typically manifested in people believing that their knowledge can help to solve job-related problems and improve work efficacy.

With regards to outcome expectations for knowledge sharing, some studies suggested that individuals would share knowledge within virtual communities with the expectations of personal outcome (e.g., enriching knowledge, recognition of being seen as skilled, knowledgeable or respected, etc.) and performance outcome (e.g., problem solving, getting tips for task completion, etc.) (Andrews, 2002; Butler, Sproull, Kiesler, & Kraut, 2002).

Although personal cognition appears to be a particularly relevant construct for examining individuals' knowledge-sharing process, only a relatively small amount of research has alluded to the possible influence of cognitive differences on knowledge sharing in online contexts (Cabrera, Collins, & Salgado, 2006). Identifying personal cognition (Bartol & Srivastava, 2002; Kankanhalli, Tan, & Wei, 2005) and the relationships among members' underlying knowledge-sharing behaviors in online communities will help both academics and practitioners gain insights into how to stimulate knowledge sharing in online CoPs. This influence has yet to be tested empirically and thus, this study investigated the impact of individuals' personal cognition on online knowledge sharing.

According to the social cognitive theory, a person's behavior is partially shaped and controlled by the influences of the person's cognition as well as social network

(Bandura, 1989, 1997). Social influences in a community include relationships with other community members and the leader of the community. Specifically, how individuals perceive their relationships with other members and the leader(s) is expected to influence their behaviors within the community. Thus, the social network as another dimension of the social cognitive framework in this study includes a sense of community and leadership of a community. Recent conceptual studies have suggested that a sense of community (Hars & Ou, 2002; Von Krogh, Spaeth, & Lakhani, 2003) and social identity (Dholakia, Bagozzi, & Pearo, 2004) can enhance the likelihood of members contributing and participating in an online community but yet to be tested empirically.

Also, increasing voices in the community literature is that leadership of a community has been almost neglected, although it has been suggested in practice as another critical element for facilitating knowledge sharing and indicating a community's success (Fontaine, 2001; Klein, 2005). Community leaders are people who connect community members by encouraging participation, facilitating and seeding discussions, and keeping events and community activities engaging and vibrant (Bourhis, Dube & Jacob, 2005). However, no identified research has been conducted on the role of community leaders on members' knowledge-sharing behaviors. Thus, despite its practical importance in the literature related to communities of practice, we still do not have a solid understanding of the impact of the social factors within communities on individual engagement in online knowledge sharing. Therefore, based on the social cognitive framework, when exploring the factors related to online knowledge sharing, it is meaningful to include these four variables (self-efficacy, outcome expectations, leadership of a community, and sense of community) because it is anticipated that they

will have some relationship with the success and effectiveness of online communities of practice. Based on the discussion above, the conceptual framework for the study is presented in Figure 1 along with the detailed discussion of the relationships of the variables of the study later in this Chapter.

Research Hypotheses

In order to address the research questions, a conceptual model and related research hypotheses are presented. Specifically, they were established based on an integrative literature review, considering the theoretical relevance among the suggested constructs. This model was derived from previous research on knowledge sharing premised on the idea that knowledge sharing behavior is an individual level phenomenon that can be affected by both personal and social contextual constructs.

Self-Efficacy

Extensive literature reveals the powerful role and the variety of roles that self-efficacy plays in both motivation and performance (Bandura, 1997; Comb & Luthans, 2007). The relationship of self-efficacy to intentions is explicitly recognized by Bandura (1997) as follows: “Beliefs in personal efficacy affect behavior both directly and by influence on intentions” (p. 284). The construct of self-efficacy has been validated to predict action and attitudes in a variety of contexts and sample types and is a predictor of action in highly complex tasks (Bandura & Wood, 1989; Dulebohn, 2002; Kuhn & Yockey, 2003). As one of the most validated and researched theory of motivation, across subject and task types (Bandura, 1997), self-efficacy is an ideal theory to understand why people choose to do certain behaviors in some contexts and not in others.

Knowledge sharing involves the context compatibility of those who share knowledge. For example, employees who share certain professional similarities, such as work interests or values, tend to engage in knowledge sharing (Huang & Wang, 2002; Wah, Menkhoff, Loh, & Evers, 2005). A full understanding of how efficacy beliefs influence collective action requires consideration of the social nature of groups (Zaccaro, Blair, Peterson, & Zazanis, 1995). In the self-efficacy literature, there is significant empirical evidence showing a positive relationship between perceived efficacy and collective identity (Bonacich & Schneider, 1992; Dholakia et al., 2004), collective efficacy (Lu et al., 2006; Walumbwa, Lawler, Avolio, Wang, & Shi, 2005), and cooperation (Chen et al., 1996; Kerr, 1992; Van de Kragt et al., 1983). Specifically, individuals who report higher judgement of self-efficacy are more likely to cooperate. For example, Lu and his colleagues reported that a coworker's collegiality, a similar construct to sense of community, was positively related to self-efficacy for knowledge-sharing (Lu et al., 2006). In other words, the person must not only believe in his or her ability, but also in his or her support system. In a community, a community member's perception, understanding, attitudes, feelings, etc. about community and his or her relationship to it and to others' participation, that is sense of community, is believed to be one's support system. In a similar vein, it is expected that self-efficacy will affect knowledge sharing through a social context such as sense of community.

In addition, self-efficacy research supports that self-efficacy to share complex knowledge will positively predict the action of sharing knowledge (Bok & Kim, 2002; Cabrera & Cabrera, 2002; Chen et al., 1996; Kankanhalli et al., 2005). Therefore, it can be assumed that self-efficacy in the ability to share knowledge would predict actual

knowledge-sharing activity. As a result, the following hypotheses on self-efficacy are presented:

Hypothesis 1: Community members' self-efficacy will be positively associated with sense of community.

Hypothesis 2: Community members' self-efficacy will be positively associated with knowledge sharing.

Outcome Expectations

Researchers have suggested that individuals are more likely to engage in the behavior they expect to result in favorable outcomes (Bandura, 1997; Bock, Zmud, Kim, & Lee, 2005). Employees will intend to share knowledge if they perceive their own knowledge needs and goals (Van den Hooff & Van Weenen, 2004), or if they expect reciprocal knowledge sharing from coworkers (Bock et al., 2005). In addition, people tend to contribute actively to communities when they perceive that this enhances their professional reputations and when they feel strong commitment to the community (Butler et al., 2002; Wasko & Faraj, 2005). Therefore, it is likely that the more an individual member has personal and performance outcome expectations for the community he or she belongs to, they are more likely to participate actively in CoP activities and thus, their sense of community will be higher. As a result, hypotheses on outcome expectations are presented as following:

Hypothesis 3: Community members' outcome expectation will be positively associated with sense of community.

Hypothesis 4: Community members' outcome expectation will be positively associated with knowledge sharing.

Leadership of a Community

Leadership, in general, has long been considered an important contributor to employees' behaviors and performance (Bass, Avolio, Jung, & Berson, 2003; Podsakoff,

MacKenzie, Moorman, & Fetter, 1990), and group cohesiveness (Hoyt, Blascovich, & Swinth, 2003; Pillai & Williams, 2004; Zhang, Fjermetad, & Tremaine, 2005).

Particularly, with regards to knowledge sharing, it has been suggested that leaders should encourage employees to share their ideas by creating a climate that is receptive to new ideas (Bryant, 2003), by implementing an integrated knowledge-based technological system (Pan & Scarbrough, 1998), and by ensuring an adequate sociocultural environment (Newell et al., 2002). Similarly, in the virtual community environment, in which limited social cues are available, scholars suggest that community leaders must have the necessary skills and enthusiasm to stimulate member involvement and participation as well as to attract and shepherd new members (Fontaine, 2001; McWilliam, 2000; Preece, 1999). Thus, leaders of communities are expected to help members feel that their communities are activated and to dynamically promote knowledge sharing in order to build, maintain, and utilize a community's knowledge assets. Considering the above literature that suggests the beneficial effect of leadership behaviors on knowledge sharing, it is hypothesized that leadership of a community favorably contributes to members' sense of community and knowledge sharing behaviors.

Hypothesis 5: Community members' perceived leadership of a community will be positively associated with sense of community.

Hypothesis 6: Community members' perceived leadership of a community will be positively associated with knowledge sharing.

Sense of Community

The theoretical construct of sense of community is comprised of essential elements of a community: sense of belonging, trust, shared values and goals, interactivity, connectedness, and mutual interdependence among members (McMillan & Chavis, 1986;

Rovai, 2002; Westheimer & Kahne, 1993). Sense of community is a kind of recognition of environmental opportunities in the context of a community. When the context is perceived as more conducive to open communication and collaboration, individuals are more likely to become further involved in the community. In virtual communities, a sense of belonging, shared experiences, and social identity of the group are strengthened by the collaborative medium (Wenger, 1998). As a shared social identity is an important condition that promotes knowledge transfer (Kane et al., 2005), a sense of belonging to the community affects social behaviors and relations that, in turn, are likely to influence the continuity of the community (Warf, 1994; Mynatt et al., 1998). When individuals are embedded in a strong social network with other members, they are motivated to more freely share knowledge within the perceived social context of a community (Wasko & Faraj, 2005). Thus, a sense of community is expected to have a positive relationship with knowledge-sharing behaviors in online CoPs.

Hypothesis 7: Community members' sense of community will be positively associated with knowledge sharing.

In addition to the above direct relationships of knowledge sharing and with other variables, there are likely to be indirect effects of individuals' self-efficacy, outcome expectation, and leadership of a community on knowledge sharing that is mediated through the community variable, sense of community. Considering that a community is the proximal social context that determines members' decisions to share knowledge, it is likely to be more influential on their intentions to share knowledge. In other words, unlike previous studies, this study views personal cognition and community-related factors as independent variables, and knowledge sharing as a dependent variable. Further, how social contextual factors in a community act as a dependent and an independent

variable simultaneously, has not been examined. Thus, this study will attempt to identify whether the social relationships in a community can be expected to show a larger effect on knowledge sharing rather than members' personal cognition. As a result, this study views the role of the social contextual factor as an intermediate variable in exploring the link between personal cognition and knowledge sharing. That is, personal cognition might require a community-level infrastructure and mechanism, including sense of community and community leadership to transform tacit personal cognition (self-efficacy and outcome expectation) into explicit and viable results to participate in knowledge sharing.

Hypothesis 8: The relationship between self-efficacy and knowledge sharing will be mediated by sense of community.

Hypothesis 9: The relationship between outcome expectation and knowledge sharing will be mediated by sense of community.

Hypothesis 10: The relationship between perceived leadership of a community and knowledge sharing will be mediated by sense of community.

Figure 1 presents the conceptual framework that guides the study, showing the relationship between the five variables concerned in the study: (a) self-efficacy, (b) outcome expectation, (c) sense of community, (d) leadership of a community, and (e) knowledge sharing.

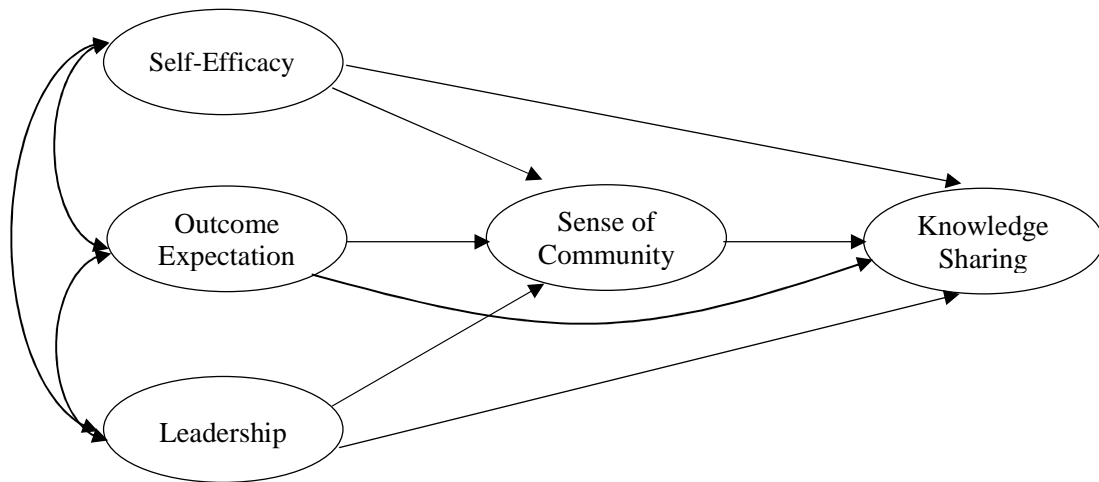


Figure 1. A conceptual model of knowledge sharing in online CoPs

Summary

In summary, little empirical research has been conducted to examine how knowledge sharing occurs and what influences the process in the online environment. Moreover, prior research has not paid much attention to the integrative view of the relationships among personal cognition, social influences within a community, and knowledge-sharing behaviors, although community members' behaviors are influenced, shaped, and determined by the element or the joint effect of the elements of the environment surrounding an individual in online communities of practice. Therefore, based on the research gaps identified in the extant literature of communities of practice and knowledge sharing, this exploratory research investigated individuals' personal cognition and perceptions of social context in a community that may determine individual engagement in online knowledge sharing.

Significance of the Study

The findings of this study are expected to fortify and expand the existing knowledge base regarding online knowledge sharing. This study will benefit both

researchers and practitioners in the knowledge-sharing arena. This study is valuable for researchers in at least four ways. First, the uniqueness of the study comes from the research variables concerning the social contextual factors that it includes: leadership of a community and sense of community. These are important and prevalent practices but have been neglected by other researchers. Although both of these factors are practically suggested as potential key elements for knowledge sharing (Klein, 2005; Sharratt, & Usoro, 2003), these suggestions are waiting to be tested based on valid empirical data. In addition, this study made contributions by testing, in a quantitative way, whether the social contextual factors in communities can be recommended as critical influencing factors as well as a mediator in online knowledge sharing.

Second, this study is meaningful in that it expanded the knowledge base in online knowledge sharing by attempting to incorporate personal cognitive factors and social contextual factors and thus contributing to the establishment of a more comprehensive model of knowledge sharing in online communities of practice.

Third, this study provided more solid pieces of knowledge and understanding related to knowledge puzzles in organizations by empirically exploring the antecedents of individual engagement in the online knowledge-sharing process.

Fourth, this study is distinctive because it targets individual members' knowledge-sharing context within an online CoPs setting. Previous studies have mainly focused on organizational settings as major contextual factors (Furlong & Johnson, 2003; Johnson, 2001), though knowledge sharing actually occurs inside each community. Thus, this study focused on community members' proximal contextual factors, that is, the community they belong to. Furthermore, this study provided a better explanation of why

certain knowledge-sharing behaviors exist by identifying and synthesizing individuals' cognition and social contextual factors of communities in the online knowledge-sharing process.

From the standpoint of practitioners in knowledge management, this study is helpful in the following regard. First, this study defines "knowledge-sharing behaviors" as including both knowledge providing and knowledge seeking aspects. Quantitative and qualitative analyses of online knowledge-sharing behavior defined this way presents practitioners with a fuller picture of the dynamics within an online knowledge-sharing system, including not only the traffic volume, but also the kinds of help users are seeking and/or providing through the online knowledge-sharing system. Second, this study will help knowledge-sharing practitioners gain a deeper understanding of what community leadership behaviors lead to different levels and patterns of involvement in community members' online knowledge sharing. This can help them to promote and provide interventions for more helpful leadership behaviors in online CoPs and, furthermore, will expand the parameters of the knowledge base regarding e-leadership.

In summary, without an integrative body of knowledge on the connection between individuals' knowledge-sharing behaviors and their contextual dynamics in online CoPs, one is hardly able to take a holistic perspective in understanding and taking advantage of the linkage for organizational purposes. This lack of systems perspective also presents a challenge for HRD professionals in determining interventions to use in maximizing diverse factors so as to enhance KM effectiveness. Also, because knowledge sharing and learning processes are closely related, it is crucial to have a better understanding of the antecedents of individual knowledge-sharing behaviors and the influencing factors on

these iterative processes. Thus, by empirically investigating the impact of contextual factors on individual members in online CoPs, this study will contribute to uncovering some of the complex dynamics that exist in processes related to knowledge sharing in the virtual workplace and, thus, it will contribute both to KM practice and scholarship. Also, understanding the process of knowledge sharing among individuals through online CoPs will be one step toward a better understanding of knowledge sharing as a whole in organizations.

Limitations of the Study

This study has the following potential limitations. First, this study investigated individuals' perceptions of knowledge sharing through use of a survey format. The survey data concerning knowledge sharing was used to analyze which type of personal cognition and which social contextual factors can predict individuals' knowledge-sharing behaviors. However, it might be difficult to come to a strong conclusion with data that is only related to individuals' perceptions. As variables were measured only by participants' perceptions, not by objective measures or outcomes, the data were self-reporting in nature. Therefore, participants' perceptions about their knowledge-sharing behaviors might not reflect complete reality.

Second, because a cross-sectional survey design was adopted, caution had to be exercised in interpreting the results of the relationship between the social-cognitive factors and knowledge sharing behaviors. Although the study theoretically assumed that the social-cognitive framework influenced community members' knowledge sharing behaviors, a causal relationship cannot be confirmed in studies that use cross-sectional survey design (Gall, Gall, & Borg, 2003).

Third, this study did not take community type into consideration, even though a variety of professional communities were explored. As a result, the different properties of different professionals might have been overlooked. Hence, the generalizability of this study may be limited to overall knowledge-sharing communities. Depending on the specific topic or professional groups of people, the patterns and dynamics of knowledge sharing might differ. This study is also limited in generalizing the findings to all of the organizations providing online communities of practice because it was carried out in one organization only.

Definition of Major Terms

1. *Knowledge Sharing*: The process in which individuals mutually exchange their implicit and explicit knowledge including knowledge seeking and providing behaviors and jointly create new knowledge (Cabrera & Cabrera, 2002; Van den Hooff & Van Weenen, 2004; Weggeman, 2002).
2. *Community of Practice*: A group of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis (Wenger, McDermott, & Snyder, 2002).
3. *Self-Efficacy*: “Beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997, p.3). Knowledge sharing self-efficacy is the judgment of one’s capability to make useful contributions and the perceived criticality of these contributions to the provision of benefits and help to others (Kankanhalli et al., 2005; Lu et al., 2006).
4. *Outcome Expectations*: An individual's belief that task accomplishment leads to a possible outcome (Bandura, 1997). Outcome expectations can be categorized into two dimensions: personal outcome expectation and performance outcome expectation (Compeau & Higgins, 1999). In this study, personal outcome expectations refer to the individual community member's judgment of likely consequences that his or her knowledge-sharing behavior will produce to him or herself, while performance outcome expectations refer to a community member’s judgment of likely consequences that his or her knowledge-sharing behavior will produce to their work-related performance.

5. *Sense of Community*: A sense that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together (Chipuer & Pretty, 1999; Long & Perkins, 2003; McMillan & Chavis, 1986). Sense of community is composed of four sub-dimensions: (a) membership, (b) influence, (c) integration and fulfillment of needs, and (d) emotional connection (McMillan & Chavis, 1986).
6. *Leadership of a Community*: Mostly as subject matter experts in the domain of knowledge for each community, community leaders provide the overall guidance and management needed to build and maintain the community, its relevance and strategic importance in the organization by encouraging participation, seeding, and facilitating discussions (Bourhis et al., 2005; Fontaine, 2001).

Chapter 2

Literature Review

The literature related to knowledge sharing and online communities of practice was reviewed to establish the conceptual framework for this study. This study involved an extensive review of the knowledge sharing and communities of practice literature. The first three parts of this review are dedicated to defining knowledge sharing, and reviewing related theoretical frameworks, and exploring the factors related to knowledge sharing in general. The latter two parts review the literature in communities of practice and the factors related to knowledge sharing in online CoPs. The final part of this chapter integrates the factors that influence online knowledge sharing based on the social cognitive theory and a conceptual framework for knowledge sharing in online communities of practice was proposed.

Overview of Knowledge Sharing

Knowledge Management and Knowledge Sharing

The concept of knowledge has always been an area of intense scholarly interest. Given the common proposition that individual knowledge and expertise are things that can provide an edge in today's knowledge economy, organizations have joined the trend of KM. The term "knowledge management" has been used loosely by researchers to refer to a broad collection of organizational practices and approaches to creating, capturing, transferring, and applying knowledge-based assets (Alazmi & Zairi, 2003; Burton & Schwen, 2003; Mac Morrow, 2001). The classification of knowledge management processes by Davenport and Prusak (1998) is popular within the literature by capturing the complexity of knowledge and aligning with people's understanding in business

settings. There are essentially four knowledge processes in this classification: knowledge generation, knowledge codification, knowledge sharing, and knowledge application.

Other researchers may use different terminologies, but their classification is similar with these four processes (Alavi & Leidner, 2001; Feng, Chen, & Liou, 2005).

Taking a closer look at the four processes of Davenport and Prusak (1998), knowledge sharing can enhance knowledge generation, which is a social process involving sharing tacit knowledge (Nonaka & Takeuchi, 1995). In another words, the purpose of knowledge sharing is knowledge generation that helps sustain organizations in a competitive market (Kalling & Styhre, 2003). Also, this process is essential in translating individual knowledge to organizational knowledge. Without knowledge sharing, organizational members will hoard knowledge and, thus, there will be very limited knowledge to be stored. On the other hand, knowledge is stored not just for the sake of storage, but for organizational members to reuse it in the future; that is to say, knowledge storage is making preparation for knowledge sharing. Also, by sharing knowledge, an organization avoids redundancy in knowledge production, secures diffusion of best practice, enables problem solving by making relevant knowledge available regardless of where it is obtained and stored originally in the organization, and so, makes better use of its knowledge (Husted & Michailova, 2002). Therefore, knowledge sharing has been identified as a major focus area for knowledge management. It is obvious that all four processes in knowledge management are highly related, and knowledge sharing is the core part because knowledge sharing provides a link between the level of individual knowledge workers, where knowledge resides, and the level of the organization, where knowledge attains its value for the corporation (Feng et al., 2005;

Henriks, 1999). In addition, although the four processes exist distinctively in theory, they are interwoven in real practice, for instance, knowledge generation happens during knowledge sharing (Nonaka & Takeuchi, 1995).

Considering its relative competitiveness, thus, knowledge sharing is commonly agreed to be a critical process within knowledge management (Davenport & Prusak, 1998; Mac Morrow, 2001). Therefore, it is reasonable to say that knowledge sharing captures the main organizational activities toward managing knowledge efficiently. On the other hand, according to Ford and Chan (2003), knowledge sharing is one of the most challenging processes for a knowledge-based enterprise, due to employees' possible reluctance to share what they know. In this respect, scholars and practitioners interests toward investigating knowledge sharing processes and factors related to them have been incessant over the past decade. Given the importance and challenges of knowledge sharing, several definitions of knowledge sharing appeared in the current literature were examined in the following section.

Knowledge Sharing: Definitions and Dimensions

Knowledge exists at multiple levels within organizations: individual, group, departmental, divisional, and organizational (De Long & Fahey, 2000), thus, knowledge sharing may occur at these different levels. In addition, there is inter-organizational knowledge sharing or even transnational knowledge sharing. This study only focuses on knowledge sharing at the individual level considering that knowledge resides within individuals (Nonaka & Konno, 1998) and individuals are the elementary but main actors at any levels of knowledge sharing process in organizations.

Definitions from Merriam-Webster Dictionary suggest that "share" may mean "to divide and distribute in shares, apportion" as well as "to partake of, use, experience,

occupy, or enjoy with others". Some researchers adopt the former meaning of "share" to define knowledge sharing. For example, knowledge-sharing "is the behavior of disseminating one's acquired knowledge with other members within one organization" (Ryu, Ho, Han, 2003, p113), "can be narrowly defined as instances whereby a member responds to a posted problem by sharing what they know" (Sharratt & Usoro, 2003, p189), or "means providing or transferring one's knowledge to others" (Bock et al., 2005, p108). The first interpretation also corresponds to the meanings of knowledge transfer in current literature (Bresman, Birkinshaw & Nobel, 1999; Roberts, 2000; Szulanski, 1996).

Knowledge transfer is frequently conceptualized as a transmission of knowledge from source entities to recipient entities, or from experts to novices, namely, the source "gives" or "distributes" knowledge to the recipient. Besides, knowledge transfer researchers usually use organizational units or organizations as analysis units (Cavusgil, Calantone & Zhao, 2003; Cummings & Teng, 2003). This line of defining "knowledge sharing" has been criticized for neglecting receivers of knowledge sharing (Dixon, 2002). The latter interpretation aligns with the ideas of Brown and Duguid (1991, 2001), Lave and Wenger (Lave & Wenger, 1991, Wenger, 1998; Wenger et al., 2002), and Nonaka and Takeuchi (Nonaka, 1994; Nonaka & Takeuchi, 1995), who describe how participants, either experts or novices, partake jointly in the process of learning from each other and creating new knowledge. Following this line of interpretation, knowledge sharing is a two-way process with both knowledge providers and knowledge takers involved. Some researchers have defined knowledge sharing this way (Hendriks, 1999; van den Hoof & Ridder, 2004; Weiss, 1999). For instance, Weggeman (2002) distinguished between a "knowledge source" and a "knowledge receiver" in the knowledge-sharing process, and

Oldenkamp (2001) discussed how knowledge sharing involves both a “knowledge carrier” and a “knowledge requester.” Recently, Ardichvili and his colleagues (2003, 2006) defined it based on its mutual nature of having both the supply of new knowledge and the demand for new knowledge. More recently, Koh and Kim (2004) argue that knowledge posting and viewing activities are the two major knowledge sharing activities in virtual communities. Another salient common characteristic from the above definitions is that knowledge sharing is likely to occur in socially interactive environment through mutual relationships. Based on this, in summary, knowledge sharing is the process in which individuals mutually exchange their implicit and explicit knowledge and jointly create new knowledge. Thus, without the capacity for sharing knowledge, no business network can utilize the specialized resources and capabilities of its members, nor can it coproduce new knowledge (Bhagat, Kedia, Harveston, & Triandis, 2002; Larsson, Bengtsson, Henriksson, & Sparks, 1998). In order to have a better understanding of knowledge sharing, the following sections reviewed a few major theoretical frameworks and factors related to knowledge-sharing.

Theoretical Frameworks Related to Knowledge Sharing

Research on information sharing suggests that information exchange is a motivated process during which people intentionally select with whom to share what information and how in order to satisfy goals evoked by the features of the context (Wittenbaum, Hollingshead & Botero, 2004). From a similar perspective, knowledge sharing is also a motivated process. Researchers have studied individuals’ motivations to share knowledge by using motivation theories, such as economic exchange theory and social exchange theory (Bock, et al., 2005; Heier, Borgman, & Manuth, 2005; Voelpel &

Han, 2005), public goods theory (Cabrera & Cabrera, 2002; Lu et al., 2006; Monge & Contractor, 2003), and social capital theory (Wasko & Faraj, 2005).

Economic exchange theory has been used to explain why individuals share knowledge. It assumes that people behave by rational self-interests. Thus, only when sharing benefit outweighs sharing cost, will individuals share knowledge (Bock et al., 2005; Monge & Contractor, 2003). However, empirical findings on whether economic rewards encourage or discourage knowledge sharing are inconsistent. Heier et al. (2005) reported when ShareNet, a knowledge management system at Siemens, was launched, the promotion with economic rewards generated increase in knowledge exchange; and the number of visiting users fell down quickly after the discontinuance of this incentive system. It seems that economic rewards have positive effect in terms of encouraging knowledge sharing at the beginning. However, two studies conducted by Bock and Kim (2002), and Bock et al. (2005) show that there is a negative relationship between economic rewards and knowledge sharing. These results were supported by the result of a previous study (Osterloh & Frey, 2000), which identified that extrinsic benefits such as monetary rewards and incentives were not as effective as individuals' intrinsic benefits (i.e., self-satisfaction, recognition, etc.) in knowledge sharing. Considering the mixed research findings, further research is needed in order to find out whether economic incentives encourage or discourage knowledge sharing, so organizations can make a wise decision accordingly.

Social exchange theory has been also frequently used to explain why individuals share knowledge. This theory postulates that people return benefits given to them in a relationship and this is called the norm of reciprocity (Bock & Kim, 2002; Kwok & Gao,

2004). Different from economic exchange theory which concerns extrinsic rewards, social exchange theory concerns intrinsic rewards, such as developing and maintaining a good relationship with others. Many empirical studies have confirmed the positive relationship between reciprocity and knowledge sharing (Bock & Kim, 2002; Ipe, 2003).

Besides, public goods theory provides insights to explain knowledge sharing. This theory focuses on how to convince people to contribute to the creation and maintenance of public goods so that everybody in the collective will be able to benefit (Monge & Contractor, 2003). Once a public good is created, it can be used by anyone whether he or she has contributed or not. Cabrera and Cabrera (2002) have studied the public good dilemmas in the context of knowledge sharing in organizational settings and argued that some people may be motivated to use public goods without contributing and they are called “free riders”. Empirical studies indicate that when knowledge is considered as a public good, people are motivated to share knowledge out of community interest and moral obligations, instead of narrow self-interests (Ardichvili, et al., 2003, 2006; Lu et al., 2006; Wasko & Faraj, 2000, 2005).

Recently, social capital theory has been used to discuss the relational construct as a broad view in exchanging and combining intellectual capital-including structural, cognitive, and relational dimensions (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). The tenet of the social capital theory is that social relationships among people can be productive resources (Lin, 2001; Nahapiet & Ghoshal, 1998). Building on Nahapiet and Ghoshal (1998), Tsai and Ghoshal (1998) empirically justified how social capital facilitates resource exchange and production innovation within the organization. Wasko and Faraj (2005) examined how individual motivations and social capital influence

knowledge contribution in electronic networks of practice. However, whether the impact of social capital on resource exchange and knowledge management activities found in the organizational settings could be generalized to virtual communities is still unclear. Also, the social capital perspective explains relational resources embedded in social relationships among people, but has not been successful in describing the attributes of cognitive aspects of behaviors yet.

In summary, the above theories attempted to explain the dynamics of knowledge sharing among individuals seem to have limited outcomes in that they did not include individuals' cognition along with the context they are situated when sharing knowledge. Considering that knowledge sharing is a socially bounded practice among individuals, social cognitive theory will be examined as an alternative framework for knowledge sharing in the following section.

Factors Related to Knowledge Sharing

As indicated above, it is evident that numerous factors influence knowledge sharing process, even though there is no firm agreement about what constitutes influential variables. This section reviews the factors and variables investigated by a number of studies in relation to knowledge sharing in the extant literature. An overview of the literature indicated that people will probably share knowledge if the following pre-requisites are met although all of them are not empirically tested yet. These factors can be classified into three broad knowledge sharing constructs, on which most knowledge-sharing studies are based: individual, group, and organizational-level constructs.

Organizational-Level Factors

An organization constitutes a specific context with diverse influences on an employee's knowledge-sharing decisions. This context includes organizational culture, structure, information systems, reward systems, and leadership (Gupta & Govindarajan, 2000). Members of an organization are related to each other both formally and informally in a hierarchical structure, and are subjected to the constant influence of this structure. Thus, knowledge sharing, which is influenced by individual factors such as cognition and motivation, is also shaped by various organizational forces. Davenport, De Long, and Beers (1998) emphasized the importance of an organizational culture and in Taylor and Wright's (2004) research on an innovative culture, the capacity to learn from failure, good information quality, change management, and a predisposition to confront performance indicators, were all predictors of knowledge sharing in organizations. Also, other scholars emphasized a supportive organizational culture (Gubbins & McCurtain, 2008; Husted & Michailova, 2002; McDermott & O'Dell, 2001; Ryu et al., 2003; Shin, 2004), and effective reward systems (Husted & Michailova, 2002; McDermott & O'Dell, 2001) along with management support (McDermott & O'Dell, 2001). Specifically, Park (2002) demonstrated that some aspects of organizational cultures such as team-oriented work, fairness and trust, were more likely to succeed in their KM technology initiatives than others. As shown, most of the studies seem to have been conducted when launching a new knowledge management system. In other words, these organizational-level factors are more likely to be related to early stages of knowledge management initiatives in organizations. In addition to that, Hurley and Green (2005) suggest that task, structure, technology and people play roles in encouraging knowledge creation and transfer as they create a knowledge management culture. Most knowledge research has been conducted at

the organizational level (e.g., Chen & Edgington, 2005; Endres, Endres, Chowdhury, & Alam, 2007), leaving a fruitful ground for research on knowledge sharing at the individual level (Haas & Hansen, 2005; Tsai & Tsai, 2005). More recent studies also suggest that while organizations need to foster and participate in CoPs to leverage their full potential, they cannot fully own or control them (Anand, Gardner, & Morris, 2007; Swan, Scarborough, & Robertson, 2002). Given that the success of KM technology implementation is mediated by human behaviors (Park, Ribiere, & Schulte, 2004), the following section will review how human behaviors in knowledge sharing have been viewed in the literature.

Group-Level Factors

In knowledge-based organizations, teams are major performing units (Nonaka & Takeuchi, 1995), and good teamwork should contribute to knowledge sharing. Specifically, researchers argued that positive interpersonal interactions can facilitate knowledge sharing (Bartol & Srivastava, 2002) and that promoting a group identity, increasing the frequency of interactions, and enhancing communication are able to facilitate knowledge sharing (Cabrera & Cabrera, 2002; Kane et al., 2005). These proposed strategies are, in essence, team-building strategies that promote a common identity. Also, group benefits such as reciprocal behaviors, relationships with others, and community interest were suggested as motivational forces for knowledge sharing at group level (Wasko & Faraj, 2005). In summary, group affiliation and teamwork are able to promote communal working relationships characterized by helpfulness and responsibility, thereby facilitating knowledge sharing behaviors (Blanchard, 2007; Husted & Michailova, 2002; Jones & George, 1998).

Trust has been seen as a valuable means to enhance knowledge sharing (McEvily, Perrone, & Zaheer, 2003). Interpersonal trust is a critical social resource that facilitates cooperation and coordinated social interactions (Husted & Michailova, 2002; Lemon & Sahota, 2004; Wagner et al., 2002). In knowledge sharing, De Long and Fahey (2000) argued that the level of trust among employees in a firm has a significant influence on the amount of knowledge flowing between individuals and from individuals into the firm's databases, best practices, and other records. Roberts (2000) also argued that interpersonal trust reduces the necessity of monitoring others' cooperative behaviors and facilitates informal cooperation. In addition, Bradshaw, Powell, and Terrell (2004) stressed the efforts for building commitment, ownership, engagement, and focus in the group. Langerak et al. (2004) also concluded that satisfaction with member–member interactions and organizer–member interactions have positive effects on member participation. In this regard, under the assumption of this study that individuals' decisions to participate in knowledge sharing are influenced by the dynamic interactions of personal cognition and social influences, the following section will review regarding what factors at an individual level have been investigated in the extant literature.

Individual-Level Factors

The literature of factors related to knowledge sharing at the individual level seems to be rather thin comparing to those at other two levels discussed above. Given the nature of knowledge sharing, a two-way communication between knowledge providers and seekers, the factors related to knowledge sharing at the individual level might not be exclusive with those at group-level. Scholars seem to agree with this lack of attention paid to the individual-level factors. In their review of knowledge sharing literature, Kalling and Styhre (2003) commented on the relative lack of attention paid to the role of

motivational factors that influence knowledge sharing behaviors. Particularly, their synthesis of the literature suggests that motivational factors surfaced by other researchers reflect individual benefits as motivational forces such as self-interest and personal gains (Wasko & Faraj, 2000, 2005). A handful of studies examined individuals' extrinsic motivations (i.e., monetary rewards, incentives for promotion, educational opportunity, etc.) and intrinsic motivations (i.e., self-satisfaction, recognition, etc.) in knowledge sharing (Bock & Kim, 2002; Bock et al., 2005; Osterloh & Frey, 2000) but they showed mixed results of the findings as discussed in the above section. On the other hand, Herzberg (2003) found that financial rewards and other external factors are important in avoiding demotivation, but have little effect on sustaining the motivation of employees.

In addition, potential individual benefits such as self-interest, personal gains, and career or job-related outcome expectations (Constant et al. 1994; Wasko & Faraj, 2000) have been neglected in examining the factors related to knowledge sharing despite the fact that individuals are the main actors in the process. Moreover, even one of the most frequently addressed topics in the psychology and management literatures, personality, has not been examined in the knowledge sharing literature yet. Given that knowledge resides within individuals and they take actions with certain purposes, expectations, and motivations, we must understand the factors that affect knowledge-sharing at an individual-level.

Community of Practice

Community of Practice: Definition and Dimensions

Since Wenger (1998) coined the term "community of practice" initially, many scholars have established the notion further. In their book on situated learning, Lave and

Wenger (1991) defined it as “an activity system about which participants share understandings concerning what they are doing and what that means in their lives and for their community” (p 98). Later, Wenger et al. (2002) specified the definition of communities of practice (CoPs) as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (p4). According to Wenger (1998), CoPs are pervasive in our life before the term was coined while the term CoPs may be new. Also, they are different from teams and functional units as they are self-organizing systems whose lifespan is determined by its members, based on the intrinsic value that membership brings. Wenger (1998) has further defined that not everything called a community is a community of practice. A neighborhood, for instance, is often called a community, but is usually not a community of practice. There are three dimensions of the relation by which practice is the source of coherence of a community: mutual engagement, joint enterprise, and shared repertoire (Wenger, 1998).

Mutual Engagement. Membership in a community of practice is a matter of mutual engagement. This is what defines the community and geographical proximity is not sufficient to developing a common practice. What makes engagement in practice possible and productive is as much a matter of diversity as it is a matter of homogeneity. Community members specialize, gain a reputation, make troubles, and distinguish themselves, as much as they develop shared ways of doing things (Lave & Wenger, 1991). It draws on what they do and what they know, as well as on their ability to connect meaningfully to what they do not do and what they do not know. Thus, mutual engagement is inherently partial. In the context of a shared practice, this partiality is as

much a resource as it is a limitation. It is more important to know how to give and receive help than to try to know everything. Disagreement, challenges, and competition can all be forms of participation. A shared practice thus connects participants to each other in ways that are diverse and complex.

A Joint Enterprise. A joint enterprise does not mean agreement, but means that members communally negotiate on certain topics in order to validate ideas and figure out what is the best way of doing things under specific contexts. Usually, communities of practice evolve by themselves from inside. They develop in larger historical, social, cultural, and institutional contexts with specific resources and constraints. The enterprise is never fully determined by an outside mandate, by a prescription, or by any individual participant because it is the community that negotiates its enterprise. The influences of external forces are important, but they must be understood as mediated by the community in which their meanings are to be negotiated in practice.

A Shared Repertoire. Over time, the joint pursuit of an enterprise creates a shared repertoire as resources for negotiating meaning. The repertoire of a community of practice includes routines, words, tools, ways of doing things, stories, metaphors etc. that the community has produced or adopted in the course of its existence. The shared repertoire of a community is a source for the negotiation of meaning, so it is shared in a dynamic and interactive sense (Lave & Wenger, 1991; Wenger, 1998, p 103).

Communities of practice are not called that in all organizations. They are known under various names, such as learning networks, thematic groups, or tech clubs. As Wenger (1998) argues, while they all have the three elements of a domain, a community, and a practice, they come in a variety of forms. It is the combination of these three

elements that constitutes a community of practice. And it is by developing these three elements in parallel that one cultivates such a community. Also, communities develop their practice through a variety of activities: problem solving, mapping knowledge and identifying gaps, reusing assets, seeking experience, and others (Wenger, 1998).

Community of Practice in Organizations

The realization of knowledge as embedded and constructed from and through social relationships and interactions (Nonaka & Takeuchi, 1995) has led some KM researchers to focus on the importance of communal resource (Von Krogh, 2002) and the notion of evolving communities within organizational boundaries (Brown & Duguid, 2001; Handley et al., 2006; Lave & Wenger, 1990). Communities of practice represent another way of organizing work interactions that can also be very effective for leveraging knowledge flows (Blanchard, 2007; Wasko & Faraj, 2000). The notion of CoP suggests that organizational community boundaries do not correspond with typical functional boundaries. Also, such communities are not constrained by time and space and therefore can span organizational boundaries (Wenger, 1998). Instead, it includes practice- and person-based networks, and members of CoP typically spend time helping each other solve problems. In other words, they are self-forming groups that cut across business units, geographical dispersion and functional boundaries to connect individuals sharing common disciplinary interests or tasks (Kohlbacher & Mukai, 2007; Lengnick-Hall & Lengnick-Hall, 2003; Lesser & Storck, 2003).

In such a community, mutual sources of gain arise in learning collectively through shared practices, and shared discourses and interpretative repertoires form the basis of mutual trust. Additionally, in communities of practice, learning is situated in the context

of work practices and is co-constructed during problem solving-aspects that may be different, or absent, in virtual communities. The focus of these communities is on the situated nature of learning in the context of work practices (Cox, 2005; Brown & Duguid, 1998; Wenger, 1998). From this perspective, the knowledge of an organization lives in a constellation of communities of practice each taking care of a specific aspect of the competence that the organization needs. However, the very characteristics that make communities of practice a good fit for stewarding knowledge—autonomy, practitioner-orientation, informality, crossing boundaries—are also characteristics that make them a challenge for traditional hierarchical organizations (Chiu et al., 2006). How this challenge is going to affect these organizations remains to be seen.

In addition, CoPs can be direct, face-to-face or technology-mediated in time and/or space. With the advanced development of computer-mediated communications, the increasing wide reach of the Internet, and thus the lack of physical constraints, online or global CoPs become possible and also important since these communities can help their members find others who share the same interests and concerns, no matter where they are located geographically (Kolekofski & Heminger, 2003; Wenger, 2000). These online communities are especially valuable for multinational companies, which are faced with the challenge of disseminating organizational knowledge which resides in individuals and teams spread around the world when the opportunities of face-to-face interactions are rather limited (Archidivili, et al., 2003, 2006). Thus, distributed online CoPs enabled by modern communication technologies are becoming an increasingly popular way for knowledge sharing activities between geographically dispersed

employees (Wenger et al., 2002). In many cases, online CoPs come into being and prosper in online knowledge sharing systems in organizations.

Recently, in addition to communities in organizations, there are open source community practices (Hertel, Niedner, & Herrmann, 2003; von Krogh, Spaeth, & Lakhani, 2003). As open source communities are sparsely formed as inter-organizational entities based on the need of particular projects and tasks, usually in a domain of software development and improvement (Kimble & Hildreth, 2004; von Krogh et al., 2003), they appear to be beyond the scope of the current study.

In summary, CoPs have been identified as effective loci for the creation and sharing of knowledge in organizations (Cox, 2005; Lave & Wenger, 1991). Wenger (1998) suggested that the process of knowledge sharing in social communities involves four components: practice, community, meaning, and identity. In network-based communities, these components must be reinforced by the collaborative medium, so that a sense of belonging, shared experiences, reciprocity, and cultural identity of the group are strengthened. The following sections further address how these components influence knowledge sharing in online CoPs.

Knowledge Sharing in the Online Environment

Today's workers are increasingly based in an individualistic world of weak ties where resources are frequently obtained through personal networks and individual relationships (Kimble & Hildreth, 2004). Paradoxically, as social networks become more important to organizations, the fundamental unit for many examples of virtual working is not the group but the individual. In this regard, it is critical to understand what factors affect an individual who is situated in social networks.

Within an organization, knowledge is often shared among employees in the form of various job-related documents, working procedures, organizational rules, personal experience, and know-how (Lu et al., 2006). An effective mechanism for gaining knowledge has been believed to request help from someone who may possess the knowledge or expertise required, through conversation (Brown, 2001). Within the context of an online CoP, the direct mechanisms for engaging another member of the group who may possess the knowledge one seeks is to post an open question or a request for assistance on the community's discussion board (Sharratt & Usoro, 2003).

Although the literature in online CoPs seems not to be fully elucidated with empirical evidence yet, researchers interested in understanding the motivations prompting people to share knowledge or participate in online knowledge sharing behaviors have focused on impersonal configuration of linkages between people or units (e.g., community ties or social interaction) and assets that are rooted in the network of relationships (e.g., trust, norms, and identification). For instance, Wasko and Faraj (2000) investigated that why people participate and share knowledge in three Usenet newsgroups and identified that people participate primarily out of community interest, generalized reciprocity and prosocial behavior. This result is in line with the study of Kankanhalli et al. (2005) which identified the positive relationship of reciprocity to the usage of electronic knowledge repositories by knowledge contributors under conditions of weak pro-sharing norms. Trust also has been identified as a key element in fostering the level of participation or knowledge sharing in virtual communities (Andrews, Preece, & Turoff, 2002).

Moreover, Williams and Cothrel (2000) suggest that three keys to sustain a virtual community are member development, asset management, and community relations. Furthermore, some studies suggest that a sense of community (Hars & Ou, 2002; Yoo et al., 2002) and social identity (Dholakia, Bagozzi, & Pearo, 2004; Kane et al., 2005) can enhance the likelihood of members' contribution and participation in a virtual community. Specifically, Bradshaw et al. (2004) argued that writing and presenting papers for peer review was seen as a key factor in maintaining cohesion, shared understanding of goals, and development of knowledge and sense of belonging. Besides, Kimble and Hildreth (2004) emphasized that the difficulty of building and maintaining the strong social ties needed to build a sense of community in a virtual environment should not be underestimated. As shown above, the factors related to knowledge sharing in online CoPs seem to be different than those in organization in general. The above findings appear to provide evidence for the importance of social capital as a lubricant of knowledge sharing in online CoPs; however, they need to be empirically confirmed for further suggestions and use.

A Framework of Knowledge Sharing in Online Communities of Practice (CoPs)

Social Cognitive Theory (SCT)

In order to explore knowledge-sharing behaviors within online communities of practice (CoPs), this study proposes a social cognitive theory-based model. The social cognitive theory argues that a person's behavior is partially shaped and controlled by the influences of social network and person's cognition (Bandura, 1989, 1997). The social cognitive theory has been selected as a framework for this study for the following reasons. First, as indicated above, prior studies concerning knowledge sharing in online

communities focused heavily either on organizational or technological support, or individuals' motivations for knowledge sharing, separately. Accordingly, investigating the relationship with single influencing factors, such as either individual motivations or environmental factors on the knowledge-sharing process has failed to provide a holistic picture. According to Szulanski (1996), employees' motivational forces derive from two bases: employees' personal belief structures and institutional structures such as values, norms, and accepted practices, which are instrumental in shaping individuals' belief structures (DeLong & Fahey, 2000). Thus, in the case of online communities of practice, the institutional structure that shapes individuals' personal belief structures is the community they belong to.

Second, community is a social group and, according to Wenger (1998), knowing comes from active social engagement. Learning, as a source of emergent social structure, is inseparable from the process that has given rise to it. In this regard, identifying the personal cognition and the social relationships among members' underlying knowledge-sharing behaviors in online communities would help both academics and practitioners gain insights on how to stimulate knowledge-sharing in online communities of practice (CoPs). To this end, a foundation for investigating this matter is the social cognitive theory. A social cognitive theory-based model for this study includes the personal cognitive dimension such as self-efficacy and outcome expectations for knowledge sharing, and the social contextual dimension such as sense of community and leadership of a community.

Personal Cognition

The social cognitive theory (SCT) states that an individual will take an action that has personal cognition in a social environment. Bandura (1997) advanced two types of

expectation beliefs as the major individual cognitive forces guiding behavior: self-efficacy and outcome expectations. The social cognitive theory holds that expectations about the consequences of behavior are a strong force in guiding an individual's actions. Individuals are more likely to undertake behaviors that they believe will result in valued outcomes than those that they do not see as having favorable consequences.

Self-Efficacy

The social cognitive theory predicts that self-efficacy will influence the ability of individuals to perform a behavior (Bandura, 1986). A substantial body of literature demonstrates that self-efficacy influences choices, goals, effort, coping, persistence, and performance. Studies in organizational settings have demonstrated the positive effect of self-efficacy across a wide range of organizational outcomes, including sales performance (Barling & Beattie, 1983), computer training performance (Compeau & Higgins, 1995; Johnson & Marakas, 2000), and information technology usage (Lam & Lee, 2005; Venkatesh et al., 2003). Also, perceived self-efficacy can enhance cooperation and reduce free-riding (Chen et al., 1996).

Individuals pursuing improved perceptions of competency are motivated by internal self-concept-based motivation. For these individuals, the need for a higher level of traits, competency and values in their important identities spurs them to perform a task. Through sharing useful knowledge to the organization, people feel more confident in what they can do (Cabrera & Cabrera, 2002). And this perception of enhanced self-efficacy can motivate employees to contribute their knowledge to others. In a similar vein, contributing knowledge to others may enhance CoPs members' learning and self-efficacy. According to Bandura (1997), if individuals were not confident in their certain

ability to undertake, then they would be unlikely to perform the behavior. Self-efficacy, thus, is expected to be a major determinant of knowledge-sharing behaviors of people who participate in communities of practice.

Outcome Expectations

According to Bandura (1997), outcome results from actions and may be anticipated by people while judging how well they can perform in a given situation. In other words, people will judge their expected outcomes before taking actions. Thus, individuals are more likely to engage in the behavior that they expect to result in favorable outcomes. The positive expectations can be seen as incentives and thus human behavior can be regulated by these different forms of effects. An individual's behavior may lead to positive outcome because individuals will behave with rational self-interest. Previous studies have provided empirical support suggesting that individuals' benefits (e.g., expected association, organization reward, enjoyment in helping others) may act as motivators of knowledge sharing (Bock & Kim, 2002; Kankanhalli et al., 2005).

Outcome expectations refer to an individual's belief that task accomplishment leads to a possible outcome (Chiu et al., 2006; Compeau & Higgins, 1999). The researchers categorized outcome expectations into two dimensions: personal outcome expectations and performance outcome expectations. According to Compeau and Higgins (1999), performance-related outcome expectations were found to be associated with improvements in job performance. Personal outcome expectations relate to change in image or status or to rewards, such as promotions, raises, or praise. In this study, personal outcome expectations refer to an individual community member's judgment of likely consequences that his or her knowledge-sharing behavior will produce (i.e., gaining

recognition and respect, making friends, or getting better cooperation in return), while performance outcome expectations refer to a community member's judgment of likely consequences that his or her knowledge sharing behavior will produce to their work-related performance (i.e., achieving the goals, completing tasks more efficiently, etc.).

According to the economic exchange theory, individuals will behave by rational self-interest; thus, knowledge sharing will occur when its outcomes exceed its costs or are as expected (Constant et al., 1994). In a similar vein, prior studies implied the relationship between employees' attitudes and prosocial behaviors (Brock et al., 2005; Podsakoff et al., 2000; Wasko & Faraj, 2000). They argue that if individuals believe they could improve relationships with others by offering their knowledge, they would develop a more positive attitude toward knowledge sharing. The greater the anticipated reciprocal relationships are, the more favorable the attitude toward knowledge sharing will be (Brock et al., 2005). Therefore, members who think knowledge sharing would increase the scope and depth of associations among CoPs members tend to share knowledge with others. Recent studies (Andrews, 2002; Zhang & Hiltz, 2003) also indicated that individuals would share knowledge with the expectations of enriching knowledge, seeking support, making friends, etc. Butler et al. (2002) also suggested that the primary reason for individuals to share knowledge is their expectations of being seen as skilled, knowledgeable, or respected.

According to the result of a Harris Poll by *Business Week* (1997), 42% of those involved in a virtual community said that their participation is related to their profession. This demonstrates that individuals participate in community activities with some level of performance outcome expectations. However, this construct has been rarely investigated

as another potential antecedent for knowledge sharing. In this respect, this study examined community members' outcome expectations as potential influencing factors on online knowledge sharing.

Social Context within a Community

Scholars contend that knowledge supersedes any one individual, is highly context dependent, and is embedded within a community (Brown & Duguid, 1991; Lave, 1991; Wenger, 1998). Through the dynamic process of interchange within a community, knowledge is constantly regenerated and recontextualized, thus maintaining its relevance to the community (Wasko & Faraj, 2000, p.123). This statement, coupled with the perspective of social cognitive theory, strongly suggests that social influence from a community needs to be examined as another major axis of knowledge sharing in online CoPs. The dimension of social context in a community is related to community factors such as sense of community and leadership of a community.

Sense of Community

Sense of community, as the first dimension of the social context of a community, is a multifaceted concept. McMillan and Chavis (1986) define community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (p. 9). Unger and Wandesman (1985, p.155) define sense of community as "feelings of membership and belongingness and shared socio-emotional ties." Others define sense of community as a result of interaction and deliberation by people brought together by similar interests and common goals (Westheimer & Kahne, 1993), or as an environment in which people interact in a cohesive manner, continually reflecting upon the work of the group while always respecting the differences individual members bring

to the group (Graves, 1992). These definitions suggest the most essential elements of community: mutual interdependence among members, sense of belonging, connectedness, spirit, trust, interactivity, common expectations, shared values and goals, and overlapping histories among members (Chavis, Hogge, McMillan, & Wandersman, 1986; Rovai, 2002). In summary, it represents a community member's perception, understanding, attitudes, feelings, etc. about community and his or her relationship to it and to others' participation.

These dynamics are incorporated in the sense of community model of McMillan and Chavis (1986). This model consists of four dimensions and the construct definition of each of the dimensions is summarized in Table 1.

Table 1

Dimensions of Sense of Community

Dimension	Description of the Dimension
Membership	which creates feelings of emotional safety with a sense of belonging to, and identification with, the larger collective
Influence	which characterizes the reciprocal relationship of the individual and the community in terms of their ability to affect change in each other
Fulfillment of Needs	which enables individuals to get their needs met through cooperative behavior within the community, thereby reinforcing the individuals' appropriate community behavior
Emotional Connection	which is the emotional support and the belief that community members have and will share history, time, places, and experiences

Note. Based on Chavis et al., (1986); Long & Perkins (2003).

This model was originally developed to accommodate a community conceptualized as a geographical territory, and as a relational network (Chipuer & Pretty, 1996; McMillan & Chavis, 1986; Schaubroeck, Lam, & Cha, 2007). A sense of

belonging grows from active participation and experience (Wilkinson et al., 1998). The process of interaction and having a common goal are considered key factors for fostering a sense of belonging (Rovai, 2002). People who share a common identity are likely to have similar goals, rules, and interests and are therefore more likely to share information (Teo, Chan, Wei, & Zhang, 2003). Sense of belonging to the community affects social relations which in turn is likely to lead to greater intention to be further involved in the community (Mynatt et al., 1998; Warf, 1994). Thus, it is expected that communities that have fewer transient members and higher levels of participation will engage in more knowledge-sharing activities.

Indeed, as a multifaceted and integrated social construct, sense of community is related to two similar but different theories: social capital theory and social cognitive theory. The social capital theory refers to close interpersonal relationships that exist among individuals (Bolino et al., 2002; Lin, 2001). There are three dimensions of social capital: structural, cognitive, and relational (Nahapiet & Ghoshal, 1998). The structural dimension refers to the pattern of interactions among individuals, including the ties or connections. The cognitive dimension of social capital is gained through a shared language and shared narratives among members. Lastly, the relational dimension is the affective part of social capital - interpersonal trust, existence of shared norms, and identification with other individuals in the network. Social capital theory overlaps with social cognitive theory in that they both stress the value of interaction and connections, and recognize social contexts as major potential factors for predicting individual behaviors. Thus, they are not mutually exclusive. Specifically, the most outstanding

common characteristic underlying the theories is that they are rooted in explaining and promoting robust social relationships among individuals.

Scholars argue that when two individuals are influenced by their social and organizational contexts, especially where unspecified cooperative outputs such as knowledge are exchanged, the social relationship is a major determinant of their attitudes (Constant et al., 1994; Organ & Konovsky, 1989). A recent study in organizational learning and knowledge management pointed out that knowledge-sharing effectiveness will be influenced by three factors: level of participation, level of consensus and cooperation, and satisfaction with group processes (Ma et al., 2006). Kane, Argote, and Levine (2005) suggested that a shared social identity is an important condition that promotes knowledge transfer. Also, employees who believe their mutual relationships with others can improve through their knowledge sharing. In addition, Wenger (1998) suggested that in online communities a sense of belonging, shared experiences, and cultural identity of the group are strengthened by the collaborative medium. Thus, a sense of community is expected to have a positive relationship with knowledge-sharing behaviors in online CoPs.

Another discovery from a review of the extant literature is that scholars use different terminology in defining the phenomenon of sense of community. Group cohesiveness (Zaccaro et al., 1995), group identity (Cabrera & Cabrera, 2005; Kane et al., 2005; Shamir et al., 1993), and coworker collegiality (Brodbeck, Kerschreiter, Mojzisch, & Schulz-Hard, 2007; Lu et al., 2006) overlap with the notion of sense of community. However, despite the potential impact of these constructs sense of community as another potential determinant of knowledge sharing in online CoPs. Thus, this study investigates

the impact of sense of community on individuals' knowledge-sharing behaviors via online communities of practice.

In addition, according to a recent empirical study by Yoo, Suh, and Lee (2002), community members' sense of community plays a role as a mediating variable to members' participation in virtual communities. A recent study also indicated that co-worker collegiality, a similar construct to sense of community, was positively related to self-efficacy and, thus, knowledge sharing (Lu et al., 2006). These results support the important influence of interpersonal relationships on knowledge sharing, while they imply the possible mediating role of sense of community in knowledge sharing. Thus, this study examines if sense of community can mediate the relationship between self-efficacy and knowledge sharing in online CoPs.

In a similar vein, another aspect worthy of note is regarding the relationship between the perceptions of collective identity as a community and outcome expectations (goals) of individuals. The perception of successful group performance has been found to be directly linked to followers' perceptions of themselves as a collective entity able to accomplish a high-level task effort (Conger & Kanungo, 1998; Shamir et al., 1993), which leads individuals to strive to achieve the mission of the group rather than their own personal goals and expected outcomes (Shamir et al., 1993). Thus, this study will further examine if sense of community (similar construct to collective identity) can mediate the relationship between individuals' outcome expectations and knowledge sharing.

Leadership of a Community

In this study, as another dimension of the social context within a community, community members' perceptions about the community leadership will be included. According to Nonaka and Takeuchi (1995), knowledge creation occurs primarily at the

individual level, while knowledge sharing occurs primarily at the group level, although knowledge is also created through group interaction. Bryant (2003) asserted that leaders encourage employees to share their ideas by creating a climate that is receptive to new ideas. Also, Politis (2002) argued that the problems associated with poor leadership and interpersonal relationships manifest themselves in the loss of organizational knowledge and the expensive duplication of knowledge creation and acquisition, rising costs, and reduced performance.

Although interpersonal relationships are most often cited as essential for successful knowledge sharing, another social influence in a community is the relationship between community members and a leader of the community. According to McWilliam (2000), community leaders must have the necessary skills to stimulate member involvement and participation as well as to attract and shepherd new members. Preece (1999) also suggests that leaders' enthusiasm will help members feel that the virtual community is activated and fosters care and attention on the virtual community. However, these prior studies have not identified specifically what kind of leaders' behaviors can facilitate member involvement as well as knowledge sharing. Accordingly, little is known about the role played by leadership in the process of knowledge sharing in online CoPs. In each community, there is a leader who provides the overall guidance and management needed to build and maintain the community as well as its relevance and strategic importance in the organization. The CoP leaders, mostly as subject matter experts in the domain of knowledge for each community, connect community members by encouraging participation, seeding and facilitating discussions, and keeping events and community activities engaging and vibrant (Bourhis et al., 2005; Gagne & Deci, 2005).

According to Nonaka et al. (2000), leaders promote and develop knowledge sharing, create and energize 'ba' (the shared context for knowledge creation), and trigger knowledge creation. Additionally, it is the role of leaders to ensure and produce an adequate socio-cultural environment (Newell et al., 2002), to adopt and implement an integrated knowledge-based technological system and to create the processes in which the knowledge sharing might be effective (Nonaka et al, 2000; Pan & Scarbrough, 1998). Thus, CoP leaders should actively and dynamically promote knowledge sharing in order to build, maintain, and utilize a community's knowledge assets.

Despite the ever-increasing use of virtual workplaces, relatively little leadership research within online work environments has been conducted. Similarly, little study has been conducted insofar as leadership research in online CoPs. Also, leadership is a key variable in small-group decision making (Zhang, Fjermetad, & Tremaine, 2005) but research on e-leadership in group settings has been scant. Recently, a few studies on a number of group processes within virtual groups have appeared (Hollingshead, 1996; Hoyt, Blascovich, & Swinth, 2003). However, research on leadership in online CoPs has been virtually ignored in the literature.

While studying how organizations may support their CoPs, Fontaine (2001) identified 11 formal and informal roles needed to keep communities afloat. Among those roles, two are considered leadership roles: leaders and sponsors. This study, despite its anecdotal nature, marks a first step in understanding how leadership may influence a community's success. Another recent study (Dube et al., 2005) shed light on community leadership research, although they conceptually focused on how organizations manage its CoPs rather than individual leaders' behavioral influences. Thus, this study will attempt

to fill the gap in the current literature of community leadership by examining how leaders' behaviors influence community members' knowledge sharing, particularly in online CoPs. In order to investigate the impact of community leadership on online knowledge-sharing behaviors, transformational leadership will be employed as the theoretical framework in this study.

Transformational Leadership

Transformational leadership, proposed by Bass (1985), is thought to achieve remarkable levels of performance from followers. Transformational leaders are active leaders that usually have four characteristics: charisma, inspiration, intellectual stimulation, and individualized consideration (Bass, 1985; Conger, 1999). It engages followers by appealing to their upper-level needs (e.g. self-actualization) and ideals that yield higher levels of follower satisfaction, performance, and organizational commitment in individuals (Bass, 2000; Shin & Zhou; 2003), job satisfaction (Fernandes & Awamleh, 2004) and team cohesiveness (Bass, Avolio, Jung, & Berson, 2003; Pillai & Williams, 2004). These transformational behaviors' are believed to supplement the impact of transactional leader behaviors on employee outcome variables, because "followers feel trust and respect toward the leader and they are motivated to do more than they are expected to do" (Yukl, 1989, p. 272). Bass (1985) has suggested that transformational leadership should supplement or augment transactional leadership (contingent reward and management by exception), such that transformational leadership should be positively associated with higher levels of subordinate motivation, effort, satisfaction, and performance above those associated with transactional leadership alone. While each of these approaches differs somewhat in the specific behaviors they associate with transformational leadership, all of them share the common perspective that effective

leaders transform or change the basic values, beliefs, and attitudes of followers so that they are willing to perform beyond the minimum levels specified by the organization (Schriesheim, Castro, Williams, Medsker, & DeChurch, 2000).

Although transformational leadership theories (Bass, 1985; Bennis & Nanus, 1985; House, 1977) each specify a slightly different set of leader behaviors, there is a great deal of consensus among researchers on these behaviors. In an extensive review of this emerging stream of research, Podsakoff et al. (1990) identified six key classes of transformational leadership behaviors: articulating a vision, providing an appropriate model, fostering the acceptance of group goals, having high performance expectations, providing individualized support, and intellectual stimulation. The construct definition of each of these transformational leadership behaviors is presented in Table 2, along with a brief explanation of each behavior.

Table 2

Dimensions of Transformational Leadership

Dimension	Description of the Dimension	
Core Transformational Leadership	Identifying and Articulating a Vision	Behavior on the part of the leader aimed at identifying new opportunities for his or her unit/division/company, and developing, articulating, and inspiring others with his or her vision of the future.
	Providing an Appropriate Model	Behavior on the part of the leader that sets an example for employees to follow that is consistent with the values the leader espouses.
	Fostering the Acceptance of Group Goals	Behavior on the part of the leader aimed at promoting cooperation among employees and getting them to work together toward a common goal.
High Performance Expectations	Behavior that demonstrates the leader's expectations for excellence, quality, and/or high performance on the part of followers.	

(continued)

Table 2 (continued)

Dimension	Description of the Dimension
Individualized Support	Behavior on the part of the leader that indicates that he/she respects followers and is concerned about their personal feelings and needs.
Intellectual Stimulation	Behavior on the part of the leader that challenges followers to reexamine their assumptions about their work and rethink how it can be performed.

Note. Podsakoff et al. (1990).

The transformational leadership behaviors by Podsakoff et al. (1990) was employed for assessing leadership in a community with the following reasons. First, they match with all of the transformational leadership behaviors by Bass (1985), the most popular one in management literature. The dominant measure of transformational leadership, the Multifactor Leadership Questionnaire (MLQ; Bass, 1985; Bass & Avolio, 1990), has been shown to sometimes suffer from psychometric shortcomings (Bycio et al., 1995; Tepper & Percy, 1994; Yukl, 1998) and theoretical problems (Podsakoff et al., 1990; Yukl, 1998).

Second, the transformational leadership inventory (TLI) developed by Podsakoff et al. (1990), as recent evidence indicates that its factor structure, internal reliability, and concurrent and predictive validity are quite good (Podsakoff, MacKenzie, & Bommer, 1996; Schriesheim et al., 2000). In addition, it has been employed in research of organizational citizenship behaviors (OCB). According to Organ, OCBs are “behavior[s] of a discretionary nature that are not part of employees’ formal [role] requirements, but nevertheless promote the effective functioning of the organization” (1988, p. 4). Given that some scholars regard knowledge-sharing behaviors as being a part of organizational

citizenship behaviors, such as courtesy and reciprocal altruism (Yu & Chu, 2007), this perspective of transformational leadership behaviors by Podsakoff et al. (1990) was employed in this study.

With the ubiquity of the Internet and the growth of virtual work teams, researchers have begun to examine the impact of transformational leadership on knowledge creation in the computer-mediated groups (Sosik, 1997). Moreover, a recent study in virtual team research suggests that transformational leadership behaviors are encouraged to display for leaders in virtual environments (Kahai & Sosik, 2004). Accordingly, transformational leadership will be appropriate as a theoretical background for community leadership in this study and this was discussed in more details in the following sections.

Transformational Leadership and Knowledge Sharing

Transformational leadership theory provides a foundation for understanding how leaders impact the cultivation of knowledge (Bass, 1985; Conger & Kanungo, 1998). According to Eden (1992), transformational leadership is the mechanism through which managers raised performance expectations and, in turn, increased performance. Conceptual and empirical research that examine the subdimensions of transformational leadership behaviors are likely to support the above propositions as follows.

An empirical study indicates that when managers operationalize charisma and utilize inspiration, individualized consideration, and intellectual stimulate, they elicit positive reactions from employees (Awamleh, Evans, & Mahate, 2005). Such transformational qualities stimulate higher level needs of followers and result in feelings of satisfaction. This finding is supported by other leadership researchers (Bass & Avolio,

1990). The attention that leaders give to employees will be reflected in their general positive attitude toward work and work conditions, which in turn, increases job satisfaction and facilitates performance. Also, as transformational leadership involves motivating through facilitating identification with the group and linking work values to follower values (Shamir, Zakay, Breinin, & Popper, 1998), it appears that transformational leaders support their followers' autonomy and allow satisfaction of the basic psychological needs.

Bryant (2003) argued that several elements of transformational leadership theory explain leaders' role well in managing knowledge. First, transformational leaders create an atmosphere conducive to knowledge creation, sharing, and exploitation. In particular, by encouraging intellectual development and paying individual attention to employees, transformational leaders motivate their employees to create and share knowledge. Second, transformational leaders attract talented individuals by clearly articulating a challenging vision and strategic goals for the organization (Conger & Kanungo, 1998; Podsakoff et al., 1990). Third, transformational leaders inspire employees to higher levels of innovation and effectiveness. Because transformational leaders provide a vision, inspire employees, and give individual consideration, their style fits well with the needs of knowledge workers. Although it is not an empirical research, it provides a conceptual foundation in integrating the transformational leadership and knowledge management literature. In a similar vein, the transformational leadership is associated with knowledge sharing in this research. Thus, following the conceptual and empirical considerations presented above, it may be inferred that community leaders' transformational leadership behaviors positively influence community members' knowledge sharing. Thus, it may be

hypothesized that there is a positive relationship between transformational leadership behaviors of a community leader and community members' knowledge sharing in online CoPs.

Transformational Leadership and Sense of Community

There are four mechanisms through which transformational leadership may enhance sense of community. First, transformational leaders communicate a high level of confidence in a group's ability to achieve ambitious collective goals (Podsakoff et al., 1990). This confidence on the part of leaders can have a contagious effect on members' own confidence (McNatt & Judge, 2004). Second, transformational leaders model desired behaviors and encourage followers to engage in analysis. Such guidance provides community members with a better understanding of how to approach their work and should therefore strengthen their belief that they can execute the behaviors (Schaubroeck, Lam, & Cha, 2007). Third, transformational leaders show concern for followers' needs. Such concern should promote a belief among community members that the leader will provide them with any support that they might need from him or her. Consistent with the reasoning above, in a study of 50 field companies in the Israel Defense Forces, Shamir, Zakay, Breinen, and Popper (1998) found that perceptions of leader supportive behavior were positively related to group cohesiveness. Finally, transformational leaders promote cooperation among group members. Such efforts should foster a belief among community members that any disagreements that arise will be resolved and thus it will strengthen members' cohesiveness.

In addition to the above direct relationships of knowledge sharing and with other variables, there are likely to be indirect effects of individuals' self-efficacy, outcome

expectations, and leadership of a community on knowledge sharing that is mediated through a community variable, sense of community. Considering that a community is the community members' proximal social context that determines their decisions to share knowledge, it is likely to be more influential on their intentions to share knowledge. In other words, unlike previous studies, this study views personal cognition and community-related factors as the independent variables, and knowledge sharing as the dependent variable. Further, how social contextual factors in a community act as a dependent and an independent variable simultaneously, has not been examined. This study, thus, attempts to identify whether the social relationships in a community can be expected to show a larger effect on knowledge sharing rather than members' personal cognition. As a result, this study views the role of the social contextual factor as an intermediate variable in exploring the link between personal cognition and knowledge sharing. That is, personal cognition might require community-level infrastructure and mechanism, including sense of community and community leadership to transform tacit self-efficacy into explicit and viable results to participate in knowledge sharing.

Summary

The identified or potential factors from the literature expected to influence the individual's knowledge sharing process via online communities of practice can be converged in the conceptual model shown in Figure 1. In summary, self-efficacy, outcome expectation, and leadership of a community are hypothesized to affect the knowledge sharing, both directly and indirectly through the community mediator, sense of community. This model indicates that self-efficacy, outcome expectation, and perceived leadership may effect knowledge-sharing behaviors directly (independent of sense of community), indirectly (mediated by sense of community), or both directly and

indirectly. Thus, sense of community is hypothesized to be partial mediators of the relationships between the three variables (self-efficacy, outcome expectation, and perceived leadership) and knowledge sharing. In the following section, the specific hypothesized relationships regarding these direct and indirect effects are discussed.

Chapter 3

Method

The purpose of the study was to investigate the relationship between personal cognition, social contextual factors, and knowledge sharing in global communities of practice. As described in Chapter 2, this study is based on the integrative view of individual knowledge sharing that emphasizes both personal cognitive and social contextual factors. The previous chapter reviewed related literature, which informed the selection of an appropriate method to answer the stated research questions from Chapter one. This chapter includes five sections: (a) research design, (b) population and sample, (c) instrumentation, (d) data collection, and (e) data analysis. The following sections together provide an overview of the research methods and procedure used in this study in order to understand individual members' online knowledge sharing behaviors and to identify the factors that influence their knowledge-sharing in online CoPs.

Research Design

A survey-based research design was employed to address the aforementioned research questions and hypotheses. To determine the relationships among the major variables of the study, this study was based on quantitative data from online survey questionnaires. This research study was correlational in nature because it identified the relationships among the variables concerned (Gall, Gall, & Borg, 2003), which are self-efficacy, outcome expectations, sense of community, leadership of a community, and knowledge-sharing behaviors. In this regard, a correlational design study measuring the strength and direction of the relationships among the variables fits the purpose of the study.

Population and Sample

The target population of the study consisted of employees who had participated in online CoPs in a selected company. The sample organization was selected through a convenience sampling procedure, and participants were solicited based on their availability for the study (Henry, 1998). The sample for this study was drawn from employees who participated in their online CoPs in the knowledge network and were willing to participate in this study. A specific description of the organization and its communities of practice were provided in the later part of this chapter. The sample was selected in two steps: selection of an organization and selection of communities within the organization.

Organization Selection

In order to answer to the research questions about individual engagement in online knowledge sharing, this study was conducted in a large multinational company in the Midwest. The selection of an organization to participate in this research was determined by the researcher in accordance with the criteria required for participation. The major criteria for selecting an organization to participate in this research were that (a) first of all, a company should provide the technological infrastructure for online communities of practice, and (b) in order to draw a general and valid conclusion from this study, a company that has online CoPs in stable stages and diverse subject matters was necessary for this study. In addition, because supporting the research of online communities of practice is not an easy task to accomplish, substantial support from the organization was recommended. Thus, a Fortune 100 company located in the Midwest which met all the selection criteria was invited to participate in the study.

An internal contact person in the company's KM team was initially approached by email and introduced to the research. Upon an expression of interest in participating, a teleconference meeting was held to provide a verbal overview of the purpose of the research, the plan for data collection, and the significance of the study. Finally, the company agreed to participate in the research and to provide support in terms of sharing company information with the researcher, communicating with the participants on behalf of the researcher, and so on. Upon agreement of participation in the study, a KM manager introduced the knowledge sharing system (K-Net) that hosts thousands of communities to the researcher via WebEx, a web conferencing tool, and discussed the details of the data collection procedure. KM team was appointed to serve as a primary source of support and as a contact through which data collection was coordinated.

This selected organization was optimal for this study because it has been known to support online communities for knowledge sharing and employees are actively involved in online communities; thus, the first requirement of the study was met. Additionally, this company was in the process of expanding its knowledge communities system throughout the organization and was eager to improve the system and to demonstrate its effectiveness through extensive research. The results of the study could be meaningful and valuable since the participants appeared interested and willing to use the results. Furthermore, this organization was willing to provide the necessary support for the study to proceed as described earlier; thus, all the criteria required for participation was met.

Communities Selection

The criteria for selecting CoPs for this study included (a) the subject category of CoPs and (b) the duration as a community. With the criteria in mind, in order to have a

generalized understanding of the diverse communities and their members in the selected company, all of the current top 10 level categories were considered (see Table 4). Also, to provide sufficient time to establish a community and its culture, CoPs that have been active for at least six months were recommended as potential sample for this study. A community of practice at the selected company had, on the average, 30-40 members in each community although it varied among communities. Among the communities registered with the community support system (K-Net) that met the suggested criteria, approximately 50 currently active communities from the ten categories were randomly selected by the researcher with the support of the KM team. An email message was used to invite the selected communities to participate in the study.

Research Setting: Communities of Practice

This study was conducted in a multinational *Fortune* 100 company located in the Midwest. It is headquartered in the U.S. and operates in more than 20 countries around the world. As the world's leading manufacturer, the organization places strong emphasis on the creation and utilization of its employees' professional knowledge. Thus, the organization encourages its employees and customers to share ideas, solutions, expertise, and knowledge worldwide using its Web-based collaboration tool. By capturing best practices, lessons learned, and a variety of other information, the knowledge-sharing network (K-Net) enables users to explore their collective organizational intelligence and create new connections throughout the organization.

The K-Net hosts nearly 3000 communities in the system and each community consists of a group of people with a common project, professional discipline or interest within this global organization. Most of the communities in the K-Net are initiated by employees who share common interests, instead of by management interventions. A

community of practice in the selected organization is composed of a community leader, one or two delegates, a few experts, and several to hundreds of members. Community leaders are usually experienced employees who have expertise and knowledge in the selected domain of knowledge of a community. Delegates are associate managers who can run the community in the leader's absence or share part of the community management duties with community leaders. Knowledge experts are mostly subject matter experts who are recognized for their knowledge and skills in particular topic areas of communities and oversee knowledge entries in the communities.

Instrumentation

All of the constructs were measured using multi-item scales that have been previously developed and used in the literature. Permission to use and adapt the instruments was obtained directly from the authors of each measure. Survey items were drawn from the existing instruments used in past research and adapted to the current research context, online CoPs. The questionnaire included the following measures: (a) self-efficacy scale, (b) outcome expectations measure, (c) sense of community index, (d) transformational leadership behavior inventory, and (e) knowledge sharing behaviors.

Self-Efficacy for Knowledge Sharing

Items capturing self-efficacy for knowledge sharing were adapted from the pre-validated instrument of Kankanhalli and colleagues (2005), and Bok and Kim (2002). Coefficient alphas for the measure ranged from .73 to .85. As the scale was designed to assess general knowledge sharing behaviors in organizations, not in the online environment, the wording of the original scale was adapted to the current research context, online communities. The eight-item self-efficacy scale assessed one's confidence

for engaging in knowledge-sharing in online CoPs. The measure presents confidence that may be associated with knowledge-sharing behavior, such as “providing related experiences, insights or expertise,” “articulating knowledge in communicative forms,” and so on. Participants were asked to rate confidence in their ability to perform a behavior under a variety of circumstances on a 5-point Likert-type scale ranging from strongly disagree (1) to strongly agree (5).

Outcome Expectations

A measure of outcome expectations was obtained by asking individuals how much various statements about outcomes of knowledge sharing would influence their decision to participate in knowledge sharing. Items for measuring outcome expectations were adapted from Compeau and Higgins’s (1999) study, which has been used extensively in other studies (e.g., Chen et al., 2005; Chiu et al., 2006). The original outcome expectation measure was an 11-item instrument that measured individuals’ beliefs that certain behaviors will lead to specific outcomes. It consists of six items on performance outcomes and five items on personal outcomes ($\alpha = .86$, $\alpha = .85$, respectively). Previous studies show that overall reliability coefficients were high; indicating that the total score gave a reliable measure of personal and performance outcome expectations (Chen et al., 2005; Ventakesh et al., 2003). This measure was also modified to fit the online community context. Two items measuring pre-usage expectations for particular computer software in Compeau and Higgins’s (1999) study were dropped from the measure of performance outcome expectations because they were not related to the online community context. For the measures, a 5-point Likert scale was adopted with anchors ranging from strongly disagree (1) to strongly agree (5).

Sense of Community

Items capturing CoP members' psychological sense of community came from McMillan and Chavis's (1986) Sense of Community Index (SCI). The SCI is based on a theory of sense of community presented by McMillan and Chavis (1986). The Sense of Community Index (SCI) is the most broadly validated and widely utilized quantitative measure of sense of community in the social sciences. The 12-item SCI is composed of four subscales: membership, influence, integration and fulfillment of needs, and a shared emotional connection (Chavis, Hogge, McMillan, & Wandersman, 1986). Results of prior studies have demonstrated that the SCI has been a strong predictor of behaviors and a valid measurement instrument. The internal reliability coefficient of the total scale has been reported to range from 0.65 to 0.80 (Chavis, 1997; Perkins et al., 1990). Nonetheless the SCI has also been subject to criticism and limitations. The reliability of the overall 12 item scale has been adequate, however it consisted of four subscales whose reliability were inconsistent (Long & Perkins, 2003). The original SCI used a dichotomous response option such as a true or false response set that limited variability and concerned critics (Chipuer, & Pretty, 1999). Thus, based on the strong recommendation of Long and Perkins (2003), it was changed to a 5-point Likert-type response format in this study. Also, since the scale was originally developed for off-line communities, the scale was adapted to measure sense of community in the online environment. For example, the word 'live' was reworded to 'participate' and the word 'neighbor' was changed to 'community member'.

Leadership of a Community

Community leadership was measured using the Transformational Leadership Inventory (TLI) developed by Podskaoff and his colleagues (1990). The original six

dimensions of transformational leader behaviors include articulating a vision of the future, providing an appropriate model, fostering the acceptance of group goals, having high performance expectations, providing individualized support, and providing intellectual stimulation. Previous research (Podskaoff, MacKenzie, & Bommer 1996; Podskaoff et al., 1990) has provided strong evidence supporting the hypothesized factor structure, internal consistency reliability, and concurrent and discriminant validities of the scale. The factor structure of the TLI was found to possess a standardized loading of 0.60 or above in each item (Podskaoff et al., 1990). In addition, the Podskaoff et al. (1996) study found adequate discriminant validity between the measures, and reliabilities for the six dimensions ranging from 0.78 to 0.91. However, three dimensions (articulating a vision of the future, providing an appropriate model, and fostering the acceptance of group goals) were found to be highly intercorrelated and were modeled as indicators of a second-order construct called core transformational leader behavior, as in Podskaoff et al. (1990). Thus, the transformational leader behaviors were represented by four constructs: core transformational behaviors, high performance expectations, individualized support, and intellectual stimulation. This study employed the four dimensions of transformational leadership behavior.

With a total of 23 items in TLI, a pilot test of the scale was conducted with experts, including three leadership and online community scholars and two practitioners in the participating organization. Two practitioners in the participating organization indicated that setting high performance expectations seemed limited in community leaders' applicability to the particulars of leader-member relationships in online CoPs. Also, community leaders, in general, are expected to facilitate activities and participation

in their communities, rather than requesting or directing any particular performance from their members. In addition, it was deemed that leadership in online communities is different from those generally exhibited in the traditional hierarchical structure of an organization. In light of these comments and considerations, among the four dimensions of TLI, one dimension, high performance expectations, was reconsidered for this study and finally, it was dropped from the scale.

To identify the impact of community leadership on members' knowledge sharing, participants were asked to indicate their perceptions of community leaders' behaviors by responding to the items adapted from the Transformational Leadership Inventory (TLI) for the online community context. For example, the word 'group' was reworded to 'community'. The instrument is composed of four items for each of the three transformational leadership constructs, resulting in the total number of twelve item scale. Each item was completed on a 5-point scale ranging from 1 (not at all) to 5 (frequently, if not always).

Knowledge Sharing Behaviors

In order to measure individuals' knowledge-sharing behaviors, an 8-item measure was adapted from Cabrera, Collins, and Salgado's (2006) study. Based on the definition of knowledge sharing in this study (Van den Hooff & De Ridder, 2004), the items are composed of two dimensions measuring individuals' knowledge seeking and providing behaviors (four items per type of behavior). As regards to construct validity, in Cabrera et al.'s (2006) study, the factor analysis did not support dividing the variable into the two proposed subscales. It showed a reliability alpha of .73 as one-dimensional factor. However, based on the recommendations of the authors of the scale, the two dimensional factor structures were considered in this study and were confirmed through the result of a

pilot study. The items were modified to fit the online community context because they were originally developed to measure knowledge-sharing behaviors in general organizational context. For example, the word ‘my organization’ was changed to ‘my community’ and the word ‘team’ was reworded to ‘community’. Questions used a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Demographic Variables

Participants were asked to answer the questions provided for each variable: (a) gender, (b) age, (c) educational level, (d) type of job, (e) job level, (f) category of a CoP, and (g) the length of a membership in a current community. In summary, the survey for members of communities comprised of a total of 56 items (see Appendix B), covering five constructs and demographic variables. Table 3 summarizes the instrument used in the study: the constructs, tools, the number of items, and reliability coefficients from previous research. Reliability and validity estimates of the instrument in this study are reported in Chapter 4.

Table 3

Research Instrument Description

Construct	Tool	Items (N)	Reliability (α)
Self-Efficacy	Bok & Kim (2002), Kankanhalli et al. (2005)	8	.73 -.85
Outcome Expectation	Compeau & Higgins (1999)	9	.81-.87
Sense of Community	SCI (McMillan & Chavis, 1986)	12	.65-.80
Leadership of a Community	TLI (Podskaoff et al., 1990)	12	.87-.91
Knowledge Sharing	Cabrera et al. (2006)	8	.73-.85
Demographic Variables		7	-
Total		56	

Summary

Empirical research on knowledge sharing is still in its infancy (Bock & Kim, 2002; Lu et al., 2006), particularly in the online environment, and there are no well-established scales for the construct yet. Thus, this study resorted to a combination of established scales along with items specifically adapted for this research. Most of the instrument adopted measures that had previously been proven to be reliable and valid. However, in order to ensure the validity and reliability of the instruments modified to the online context, two rounds of pilot tests were conducted. First, the researcher conducted a small-scale qualitative pilot study with the experts in online community and knowledge management research and practice to ensure face validity of the questionnaire. The first draft of the questionnaire was first reviewed by six experts, that is, four professors in the fields, and two practitioners in the participating company. They were asked to review the modified instrument to assess its logical consistencies, ease of understanding, question item sequence adequacy, and contextual relevance for the CoPs in the organization. Also, second round of a pilot study with a group of community members was conducted before the main study. As a result of the pilot studies, minor changes were made and reflected in the final questionnaire. Reliability and validity of the instrument in this study are reported in Chapter 4. In addition to the survey format, respondents were provided an opportunity to express additional comments by responding to an open-ended question and therefore, qualitative data may supplement results. Any and all comments were organized and analyzed using content analysis (Appendix C).

Data Collection

After the population was determined, sample size was estimated based on the objective and the statistical technique used in the study. In order to have a valid measurement model, according to Anderson and Gerbing (1984), a sample size of 150 would usually be sufficient to obtain a converged and proper solution for models with three or more indicators per factor. Each individual member of a CoP was the unit of analysis and the target number of responses was determined to be 300 members in CoPs at the selected company, based on (a) literature on SEM (Structural Equation Modeling) (Hair, Anderson, Tatham, & Black, 1995), and (b) consultations with experts in SEM.

An online survey was utilized to collect data on participants' perceptions of the variables concerned in the study. The initial email invitation was sent by a KM manager through the K-Net hosting CoPs in the selected organization. This email introduced the study to all 50 communities and provided a link to the website where the survey was administered electronically. A response deadline of four weeks was given, during which time two follow-up emails were sent to all participants to encourage participation. For the purpose of determining that those who responded are representative of the whole population, it would be ideal to survey the non-respondents (Fowler, 1993). Due to the anonymous nature of this study, however, there was virtually no way to determine the pool of non-respondents. To address potential non-response bias, (a) follow-up emails were distributed to maximize return rate, and (b) early and late respondents on demographic information and constructs relevant to this study were compared. The results were not significant ($p < .05$), indicating that non-response bias is not a concern. Demographic information for the respondents is presented in Table 4.

Demographic Information of Participants

Over 900 members were invited to this study through the knowledge network in a participating company. All responses were anonymous and the resulting response rate was relatively high at approximately 49.2%, with a total of 443 responses received. Considering the decreasing response rate in research using online survey method (Bartlett, 2005), the response rate for this survey was found to be reasonably good. As a result of preliminary data screening, it was found that five responses were from current leaders of CoPs. Since this study only intended to examine CoP members' experience and perceptions from their communities, these five responses were excluded from the analysis, resulting in the total of 438 responses.

Descriptive statistics revealed respondents' demographic information about age, gender, level of education, functional area, job level, category of a CoP, and duration as a member in a community. Table 4 presents the distribution of the sample of employees by demographic variables. Among the respondents (n=438), 325 (74.2%) people were males and 113 were female employees (25.8%). In terms of age, respondents were almost equally distributed from the range of early 30s to late 50s, consisting of 84% of the total respondents. There were also participants whose ages were over 61 (3.4%). As for the education level, the majority of the respondents (68.7%) have bachelors and masters degrees. In terms of job level, 69.2 % of them were at a non-management level such as professional and technical staff, and support staff, 26.4% at middle-level management, and 3.2 % at senior-level management. With regard to the area of function, respondents were relatively well represented in all nine functional categories of the organization. Employees in engineering, R&D, and information systems constituted 37.4%. 11.4%

were in marketing and finance, and 49.9% were in supporting or administrative functions, such as planning, human resources, product support and so forth.

Of the participating members of communities, 48 % were in the categories of product systems development and product and service support, and 24% were members of communities in the six sigma (quality) and informational technology categories. Finally, a total of 204 respondents (46.6%) answered that they have participated in CoPs more than three years, and 37.7% of them have been with their current CoPs more than one year. This indicates that the selected company’s CoPs are in stable stages in terms of the system and practice. Table 4 presents the analysis of demographics of participants based on 438 usable responses.

Table 4

Demographic Information of Participants

Demographics	Variable	Frequency (N)	Percentage (%)
Gender	Male	325	74.2
	Female	113	25.8
Age	20-30	55	12.6
	31-40	119	27.2
	41-50	124	28.3
	51-60	125	28.5
	61 and above	15	3.4
Education	High school	40	9.1
	Associate degrees	78	17.8
	Bachelors	193	44.1

(continued)

Table 4 (continued)

Demographics	Variable	Frequency (N)	Percentage (%)
Education	Masters	108	24.7
	Doctorate	14	3.2
	Others	5	1.1
Functional Area	Accounting/Finance	4	0.9
	Engineering/R&D	106	24.2
	Project Management	20	4.6
	Marketing/Sales	46	10.5
	IT/Information Systems	58	13.2
	HR/Training	61	13.9
	Product Support	67	15.3
	Outsourcing Support	51	11.6
	Planning/Operations	20	4.6
	Others	5	1.1
Job Level	Senior-level manager	14	3.2
	Middle-level manager	116	26.4
	Professional and Technical staff	251	57.3
	Sales and Support staff	52	11.9
	Others	5	1.1
Duration as a member	Less than 6 months	31	7.1
	7-12 months	27	6.2
	1-2 years	88	20.1
	2-3 years	77	17.6
	More than 3 years	204	46.6

(continued)

Table 4 (continued)

Demographics	Variable	Frequency (N)	Percentage (%)
	Others	11	2.5
Type of a CoP	Quality/Six Sigma	65	14.8
	Corporate Governance	4	0.9
	Project Management	17	3.8
	Human Resource/Training	59	13.4
	Information Technology	43	9.8
	Product Systems Development	81	18.4
	Product and Service Support	130	29.6
	Communications/Customer Services	26	5.9
	Strategic Business Planning	5	1.1
	Finance and Marketing	3	0.7
	Others	5	1.1

Note. $n = 438$.

Data Analysis

In addition to descriptive statistics, structural equation modeling (SEM) was primarily employed to test the proposed conceptual model and the associated research hypotheses. Structural Equation Modeling (SEM) is a multivariate statistical analysis tool that enables researchers to examine correlations and test both direct and indirect impacts among interested constructs (Bollen, 1986; Hair et al., 1995). It provides a comprehensive approach for assessing and modifying theoretical models (Anderson & Gerbing, 1998). It allows the analysis of multiple relationships simultaneously, provides measures of overall model fit, and explains the significance of each of the relationships between the variables (Byrne, 2001; Kline, 2005).

SEM is distinguished by two characteristics: (1) estimation of multiple and interrelated dependence relationships and (2) the ability to represent unobserved concepts in these relationships and account for measurement error in the estimation process (Hair et al., 1995). There are two kinds of variables in SEM: a measured variable and a latent variable. A measured variable refers to a variable that can be observed directly and is measurable (Burnette & Williams, 2005). A latent variable is a hypothesized and unobserved concept that can only be approximated by observable or measured variables (Bollen, 1986). SEM is the appropriate method for this research in that it enables not only examining the impact of the exogenous variables, self-efficacy, outcome expectations, sense of community, and community leadership, but also estimating interrelated relationships among the endogenous variables, knowledge sharing and sense of community. In addition, all five variables for this study are latent variables, which are estimated by observable variables.

SEM can be conceptualized as the analysis of two hypothetically distinct models: the measurement model and the structural model (Burnette & Williams, 2005). The measurement model is a confirmatory factor analysis (CFA) model that indicates the relation of the observed variables to the proposed underlying constructs (Kline, 2005; McDonald & Ho, 2002). The structural model is used to specify the causal relations of the constructs to one another based on a priori theory and hypotheses (Anderson & Gerbing, 1988). They reasoned that assessing the measurement models before the structural models would allow respecification of the measurement models if they do not reach an acceptable level of unidimensionality, which could lead to a better structural model. Thus, in this study, the two-step procedure was adopted. First, a hypothesized

measurement model was assessed for each construct. In the measurement model, the observed variables were associated with the latent variable. After respecification of the five measurement models, structural models were assessed.

In identifying alternative models, Anderson and Gerbing's (1998) approach of testing nested structural models was followed. They suggested comparing the hypothesized model with four alternatives, a null model (where no structural relationship exists), the next most likely constrained alternative (with one more fixed parameter than the hypothesized model), the next most likely unconstrained alternative (with one more free parameter than the hypothesized model), and the saturated model (all parameters relating the constructs to one another are estimated). In this study, as the hypothesized model is already a saturated model, the next most likely unconstrained alternative and the saturated model are non-existent. Therefore, the hypothesized model was compared with a null model and a model with one more fixed parameter. Examining several fit indices to determine the overall fit of all the models, one best model was selected among those assessed based on model fit and theoretical considerations. In assessing model fit, five fit indices were employed. Table 5 describes more detailed information of the goodness-of-fit indices.

As Anderson and Gerbing (1988) suggested, this study assessed the measurement models for five variables first--self-efficacy, outcome expectations, sense of community, leadership of a community, and knowledge sharing behaviors. It served to confirm the factor structure of each variable, which led to structural models. Next, the interrelationships among these five variables were assessed. The structural model was used to specify and examine the hypothesized relationships among the constructs. The

path analysis, which specifies the causal relationship among the variables, was performed in order to identify how hypothetical constructs are measured in terms of the observed variables. Data from the web-based survey was analyzed using the statistical packages, SPSS and AMOS 16 (Analysis of MOment Structure).

Table 5

Indices for Goodness-of Fit

Indices	Definition	Fit Criteria
χ^2 Chi-square	The assessment of fit of a specific model as well as the comparison between two models.	The smaller the better fit
RMSEA	Root Mean Square Error of Approximation	The error of approximation. A real advance in the evaluation of model fit from both statistical and conceptual viewpoints, which establishes a hypothesis of close fit between the model and population.
		<.05: good fit .05 - .08:reasonable .08-.10:mediocre >.10: poor fit
CFI	Comparative Fit Index	The degree of fit between the hypothesized and null measurement models.
		>.90: good fit
GFI	Goodness-of-Fit Index	A matrix proportion of explained variance and analogous to a squared multiple correlation.
		>.90: good fit
RMR	Root Mean Square Residual	A measure of the mean absolute value of the covariance residuals.
		<.08: good fit

Note. Based on Hair, Anderson, Tatham, & Black (1995); Kline (2005).

Chapter 4

Results

This chapter reports on the results of the study in four parts. First, this section presents the results of preliminary data examination and descriptive statistics of the variables of interest. Second, reliability of the instruments used in this study was assessed with internal consistency and construct validity of the measurement was examined by testing five measurement models. Third, the hypothesized structural model was tested in comparison with several alternative structural models. The best model was selected, based on both theoretical considerations and statistical indices. The final section of this chapter addresses the result of each of the hypothesis testing.

Preliminary Data Examination

Data examination can help ensure that the results obtained for the multivariate analysis are truly valid and accurate (Hair, Black, Babin, Anderson, & Tatham, 2006). It is important to examine the data before application of the structural equation modeling technique. A total of 443 individuals completed the questionnaire. Since this study only investigated CoPs members' experience and perceptions toward their communities and knowledge sharing behaviors, five responses from individuals who identified themselves as current leaders of CoPs were excluded from the statistical analysis. After preliminary data screening, data entry was conducted using the total of 438 responses.

Normality. The SEM technique is sensitive to multivariate non-normality, and it is important to check that the data meet the required assumption. The data were preliminarily assessed using univariate skewness and kurtosis. None of the observed variables deviated from normality being highly skewed or kurtotic (i.e., greater than an absolute value of 2). Further, the variables should be multi-normally distributed to use the

maximum likelihood estimation method. AMOS provided information on multivariate normality: Mardia's coefficient and the normalized estimate¹ and the result suggested that the multivariate normality assumption was met.

Outliers. Although outliers can seriously distort the statistical tests, only problematic ones should be excluded from statistical analysis. With SPSS 16.0, outliers were detected using the Mahalanobis distance measure. The calculation of the distance divided by the degrees of freedom was employed to detect potential outliers with the threshold of 4 due to large samples (Hair et al., 2006).

Multicollinearity. Because multicollinearity decreases the reliability of SEM estimates, the collinearity diagnostics of SPSS Regression were used to assess multicollinearity. Although some dimensions had condition indices (a measure of dependency of one variable on the others) larger than .30, no dimension had more than one variance proportion larger than .50 (Belsey, Kuh, & Welsh 1980), suggesting no problematic multicollinearity.

Descriptive Statistics

Table 6 presents descriptive statistics, correlation statistics, and reliability coefficients (α) of five constructs included in this study. The descriptive and correlation statistics of the sub-constructs under each of the five constructs used in this study are presented in Table 7. Pearson product-moment was conducted to assess inter-factor correlations.

¹ The Mardia's normalized multivariate kurtosis can be interpreted as a z score. A value larger than about 3 is considered to be non-normal (Bentler, 1995).

Table 6

Descriptive Statistics, Correlations, and Reliabilities

	Mean	S.D	1	2	3	4	5
1. Self-Efficacy	4.03	.45	(.81)				
2. Outcome Expectation	3.91	.48	.53	(.85)			
3. Sense of Community	3.69	.47	.56	.58	(.88)		
4. Leadership	3.54	.59	.29	.35	.44	(.93)	
5. Knowledge Sharing	3.76	.53	.57	.51	.60	.43	(.86)

Note. n = 438, All Pearson correlations were significant ($p < .01$); Cronbach's alphas are in parenthesis.

All measures demonstrated adequate levels of reliability (.81-.93). Overall, the relationships among self-efficacy, outcome expectations, sense of community, and knowledge sharing were moderate to high, whereas the rest of the correlations showed weak relationships. Among them, the relationship between sense of community and knowledge sharing was relatively high ($r=.60$). Intercorrelations among the variables higher than .80 can be considered as evidence of high multicollinearity (Hair et al., 1998). Although the highest correlation (.60) did not reach .80, an additional analysis using the variance inflation factor (VIF) method was done to check any potential multicollinearity among the variables. As a result, of the relationships between sense of community and knowledge sharing, the highest VIF was 1.9. The VIFs ranged from 1.3 to 1.9, much less than 10 (Chatterjee, Hadi, & Price, 2000; Neter, Kutner, Nachtsheim, & Wasserman, 1996), there was no severe multicollinearity.

Table 7

Descriptive Statistics and Correlations of All Sub-constructs

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. Self-Efficacy	3.98	.44	(.81)											
2. Performance Outcome Expectation	3.99	.54	.44	(.81)										
3. Personal Outcome Expectation	3.85	.55	.49	.57	(.80)									
4. Membership	3.50	.60	.42	.25	.42	(.70)								
5. Influence	3.60	.53	.46	.38	.48	.62	(.64)							
6. Shared Emotional Connection	3.86	.58	.50	.43	.53	.57	.58	(.71)						
7. Reinforcement of Needs	3.81	.54	.46	.44	.49	.52	.59	.62	(.70)					
8. Core Transformational Leadership	3.45	.66	.28	.30	.28	.33	.37	.34	.37	(.89)				
9. Intellectual Stimulation	3.85	.63	.24	.29	.30	.29	.33	.31	.32	.78	(.87)			
10. Individualized Consideration	3.33	.70	.24	.24	.24	.28	.32	.36	.34	.67	.62	(.86)		
11. Knowledge Providing	3.74	.64	.56	.35	.45	.50	.49	.46	.51	.36	.32	.27	(.85)	
12. Knowledge Seeking	3.79	.54	.47	.46	.37	.47	.40	.41	.47	.40	.39	.35	.60	(.75)

Note. n = 438. All correlations were significant at $p < .01$; Cronbach's alphas are in parenthesis.

Structural Equation Modeling

Structural Equation Modeling (Amos 16.0; Arbuckle, 2008) was used to analyze the relationship among self-efficacy, outcome expectations, sense of community, leadership, and knowledge sharing. As recommended by Anderson and Gerbing (1988), the model was tested in a two-step approach, first confirming the measurement model and then testing the full structural model. Prior to SEM analysis, it is critical to test the pure measurement model underlying the full structural equation model to determine whether the measurement of each latent variable is psychometrically reasonable (Kline, 2005). Also, it is imperative to assess the measurement model before the structural model as the latter is based on the former (Byrne, 2001). By this logic, the validity of the measurement portion of the structural equation model was preliminarily tested using confirmatory factor analysis before attempting to test the full structural model.

As the questionnaire items were adapted from different streams of studies, it was important to first ensure construct validity and reliability. Cronbach's coefficient alpha (α) was calculated to determine reliability of the measurements used to assess the constructs. There were five latent constructs in this study: self-efficacy, outcome expectations, sense of community, community leadership, and knowledge sharing. Subscale scores on each of the self-report measures were used as individual indicators and specified to load on their respective latent construct. The following paragraphs describe the reliability of the measures for each construct and the strength of the measurement model for each latent construct. For each measurement model, two groups of indices are presented: (1) factor loadings between each measurement item and its underlying construct, and (2) the overall fit indices of the measurement model. Table 8

summarizes the reliability of all five constructs and the fit indices of the measurement models.

Measurement Model Analyses

Confirmatory factor analysis (CFA) was conducted to estimate the quality of the factor structure and designated factor loadings by statistically testing the fit between a proposed measurement model and the data (Yang, 2005). Prior to an overall CFA that included all measurement items in this study, separate CFAs were conducted for higher-order constructs: outcome expectations, sense of community, community leadership, and knowledge sharing. The following fit statistics were used to evaluate the overall fit of the measurement model: the chi-square statistic, Goodness of Fit Index (GFI), Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Root Mean Square Residual (RMR). Good model fit is indicated by a χ^2/df ratio less than 2, as well as values greater than .95 on the GFI and CFI. Additionally, a value less than .08 on the RMSEA is acceptable and a value less than .05 suggest a good model fit (Hu & Bentler, 1995; Kline, 2005).

The first measurement model examined the relationships among measures of self-efficacy for knowledge sharing. In terms of reliability, Cronbach's alpha for self-efficacy was moderately high .81, signifying a scale with adequate reliability for the overall construct of self-efficacy (questions 1 to 8 in Appendix B). Factor loadings for self-efficacy were moderate to high (ranged from .53 to .77) except for one measurement item SE7 ("Most other members can provide more valuable knowledge than I can.", factor loading = .46). Although it has been suggested that a standardized factor loading should be greater than .50 (Kline, 2005), it was close enough to be counted as fair fit for the measure. All the fit indices showed that the measurement model for self-efficacy

provided a good fit for the data ($\chi^2 = 64.53$, $df = 20$, $p = .00$, $\chi^2/df = 3.23$, $GFI = .97$, $CFI = .95$, $RMSEA = .07$, $RMR = .019$).

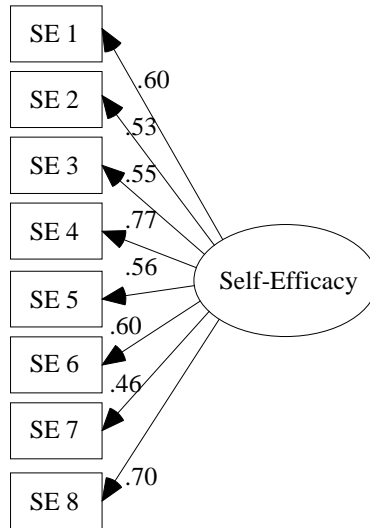


Figure 2. Measurement model for self-efficacy

The second measurement model examined the relationships among measures of outcome expectations and the two hypothesized sub-constructs. Outcome expectations were theorized to consist of two sub-constructs: personal outcome expectations and performance outcome expectations (Compeau & Higgins, 1999). For internal consistency of outcome expectations, Cronbach's alpha for the single-construct measurement model of outcome expectations was .85; for personal outcome expectations .81; and for performance outcome expectations .80, demonstrating high internal consistency of the measurement. Figure 3 presents the standardized estimates for the measurement model of outcome expectations with 9 measurement items (questions 9 to 17 in Appendix B). As illustrated in the figure, factor loadings between items and their underlying sub-constructs ranged from .61 to .80, showing that each measurement item appears to be an adequate

indicator of the latent variable of outcome expectations. The results ensured that the two-factor structure fit the data. Overall, the proposed two-dimension measurement model tends to fit the data well as the four indices were far above the criteria for fit (CFI and GFI, above 0.95, RMSEA below 0.5, and RMR below 0.04). The CFA demonstrated a good fit to the data in all aspects ($\chi^2 = 55.25$, $df = 26$, $p = .001$, $\chi^2/df = 2.125$, $GFI = .972$, $CFI = .978$, $RMSEA = .051$, $RMR = .015$).

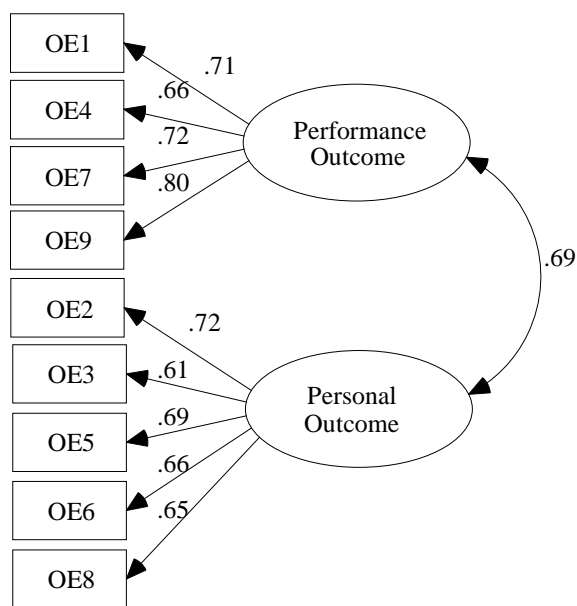


Figure 3. Measurement model for outcome expectations.

The third measurement model examined the relationships among measures of sense of community and the four hypothesized sub-constructs. For the latent variable of sense of community, the following subscales of the Sense of Community Index (McMillan & Chavis, 1986) were set as indicators: membership, influence, shared emotional connection, and reinforcement of needs. In terms of reliability, Cronbach's alpha for the overall construct of sense of community was .88; for membership, .70; for

influence, .70; for emotional connections, .71; and for reinforcement, .64, all indicating reliable measures. As Figure 4 presents, factor loadings between items and their underlying sub-constructs ranged from .56 to .78, showing that each measurement item appears to be an adequate indicator of the latent variable of sense of community. The factor loadings showed that relevant measurement items performed moderately well in reflecting the designated underlying construct. Thus, CFA has supported the priori structure for sense of community. The CFA for the measurement model of sense of community (questions 18 to 30 in Appendix B) provided a good fit to the data ($\chi^2 = 143.7$, $df = 50$, $p = .00$, $\chi^2/df = 2.59$, $RMSEA = .065$, $GFI = .94$, $CFI = .945$, $RMR = .022$).

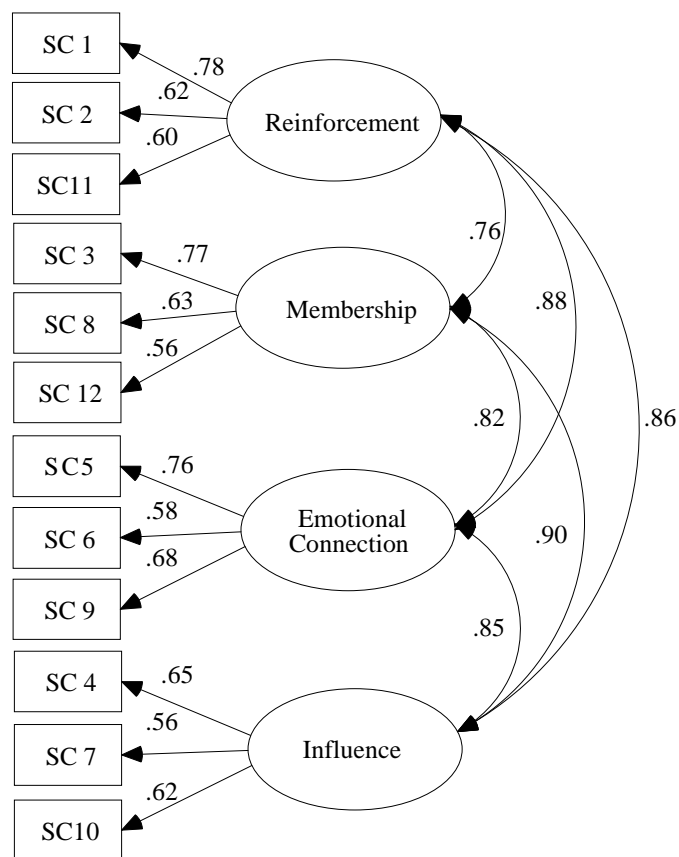


Figure 4. Measurement model for sense of community

The CFA for the measurement model examined the relationships among measures of leadership of a community. Leadership of a community was hypothesized to consist of three sub-constructs: core transformational behaviors, intellectual stimulation, and individualized supports. For leadership in a community as a whole, Cronbach's coefficient alpha was .93; for core transformational behaviors .86; for intellectual stimulation .89; and for individualized consideration .87, indicating a high reliability. Figure 5 presents the standardized estimates and measurement errors for the measurement model of leadership in a community with 12 measurement items (questions 31 to 43 in Appendix B). As shown in the figure, factor loadings ranged from .73 to .86, showing high construct validity. The CFA for the measurement model of community leadership provided a good fit to the data ($\chi^2 = 132.9$, $df = 51$, $p = .00$, $\chi^2/df = 2.6$, $GFI = .951$, $CFI = .976$, $RMSEA = .061$, $RMR = .019$). Therefore, the results demonstrated appropriate evidence of moderate to high scale reliability and validity for the overall construct of leadership of a community and its sub-constructs.

As shown in Figure 5, the core transformational leadership construct and intellectual stimulation were highly correlated, which is the same result of Podskaoff et al.'s (1990) study. According to Bass (1985), transformational leader behaviors (especially articulating and propagating new ideas and beliefs) may be a key determinant of the intellectual stimulation of followers. If so, then perhaps we should not be surprised to find that our core transformational behavior construct, which includes articulating a vision, is highly correlated with intellectual stimulation (Podskaoff et al., 1990, p122).

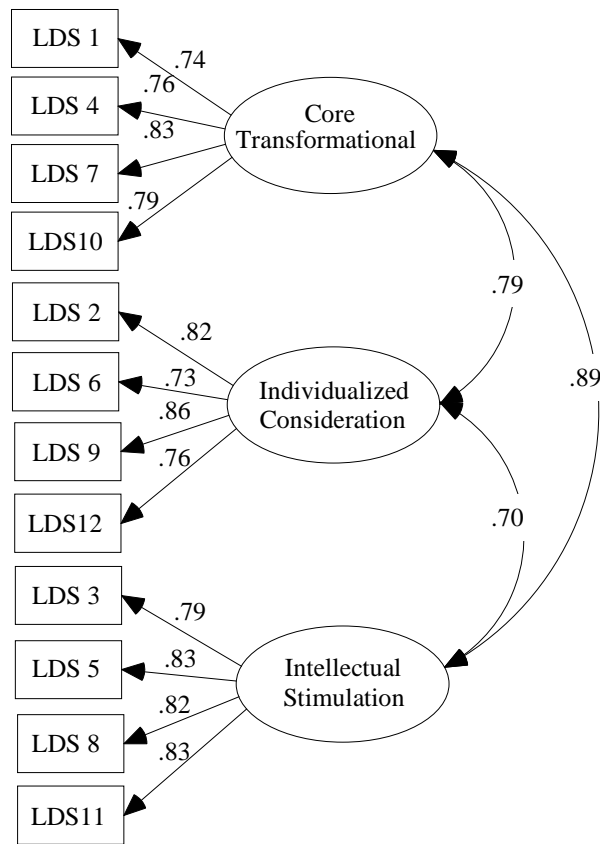


Figure 5. Measurement model for leadership of a community

The last measurement model examined the relationships among measures of knowledge sharing. For internal consistency of knowledge sharing, Cronbach's alpha reached .86, signifying a scale with adequate reliability for the overall construct of knowledge sharing; for knowledge providing, .86; and for knowledge seeking, .72. Figure 6 presents the standardized estimates for the measurement model of knowledge sharing with 8 measurement items (questions 42 to 49 in Appendix B). The overall fit indices for the measurement model of knowledge sharing showed a reasonable fit to the data ($\chi^2 = 56.86$, $df = 19$, $p = .00$, $\chi^2/df = 2.992$, $RMSEA = .068$, $GFI = .96$, $CFI = .97$, $RMR = .022$). As illustrated in the figure, factor loadings between items and their underlying sub-

constructs ranged from .62 to .80, showing that each measurement item appears to be an adequate indicator of the latent variable of knowledge sharing. The arrows from the factors to the items indicate that the factors are the ones that give rise to something that is observed, as explained in Jarvis, Mackenzie, and Podsakoff (2003).

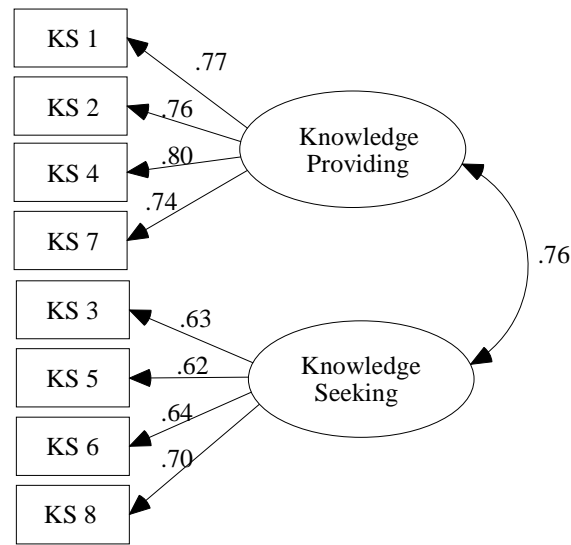


Figure 6. Measurement model for knowledge sharing

In summary, all the constructs and sub-constructs in the study achieved a moderate to high level of reliability and construct validity. A summary of the fit indices of all the five measurement models and their reliabilities are shown in Table 8.

As the convergent validity of the constructs used in the study was confirmed, the next step was to examine the discriminant validity of the complete set of constructs by conducting an overall confirmatory factor analysis, and examining the factor intercorrelations.

Table 8

Fit Indices for Measurement Models and Reliabilities of Constructs

Variables	χ^2	df	P	CFI	GFI	RMSEA	RMR	Cronbach's Alpha
Self-efficacy	64.53	20	.00	.95	.97	.071	.019	.81
Outcome Expectation	55.25	26	.001	.98	.97	.051	.015	.85
Sense of Community	143.70	50	.00	.95	.94	.065	.022	.88
Leadership	132.90	51	.00	.98	.95	.061	.019	.93
Knowledge Sharing	56.86	19	.00	.97	.94	.068	.022	.86

Note. CFI=Comparative Fit Index, GFI=Goodness Fit Index, RMSEA=Root Mean Square Error of Approximation, RMR=Root Mean Square Residual.

The results of the overall confirmatory factor analysis indicate that all of the items loaded significantly on their hypothesized factors. Moreover, the fit of this overall model to the data was quite respectable ($\chi^2 = 121.58$, $df = 45$, $p = .00$, $\chi^2/df = 2.70$, $RMSEA = .062$, $GFI = .95$, $CFI = .97$, $RMR = .011$). Thus, the hypothesized five factor model with 12-indicators was supported. Results from the confirmatory analysis indicated that the overall measurement model was found to be good fit to the data in all aspects.

Assessing Structural Models

A structural model represents the interrelationships among variables (Hair et al., 1998). The purpose of the structural model analysis is to determine whether the theoretical relationships specified at the conceptualization stage are supported by the data (Bryne, 2001; Diamantopoulos & Siguaw, 200). Following Anderson and Gerbing's (1988) approach of examining nested models, the hypothesized model was evaluated

against two alternative models, the null model that assumes that there is no relationship among the constructs and the next most likely models with one more fixed parameter.

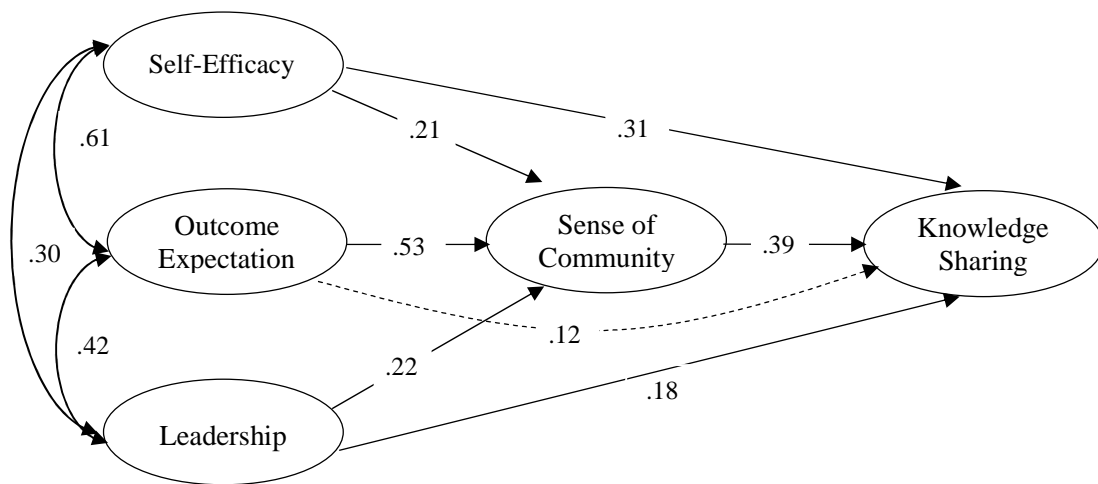
The following step is to test the relationships among the five major constructs of self-efficacy, outcome expectations, sense of community, community leadership, and knowledge sharing. First, the hypothesized model presented in Chapter 1 was examined. Then, several alternative models were investigated to find the model that best fits the data. The adequacy of the structural model was estimated by comparing the goodness-of-fit to the hypothesized model and the two additional nested models. The magnitudes of the estimated parameters and the squared multiple correlations (SMC) for the structural equations were examined. The former provides important information on the strength of the hypothesized relationships, whereas the latter indicates the amount of variance in each endogenous latent variable that is accounted for by the independent latent variables that are expected to impact upon it. The significance of the estimated paths between the hypothesized latent variables was considered in finding a best fitting model. In summary, based on goodness-of-fit indices and theoretical foundations, the best model was selected among the structural models.

Hypothesized Structural Model

After determining an acceptable measurement model, the next step was to evaluate the structural portion of the full structural equation model representing the relationships among the latent variables. An initial structural analysis was conducted on the hypothesized structural model. Figure 7 illustrates the hypothesized model with the standardized estimates² obtained by the AMOS output, indicating the strengths of the

² All the variables including latent variables and observed variables are rescaled to have a variance of one to obtain standardized solutions (Bentler, 1995).

relationships among the constructs. A summary of the fit indices for the all structural models is presented in Table 9. The overall fit indices indicated a good model-data fit in all indices (CFI and GFI above .95, RMSEA below .07, and RMR below .02). The exogenous variables of the study, self-efficacy, outcome expectations, and leadership significantly affect sense of community ($t > 1.96, p < .05$). Also, self-efficacy, sense of community, and leadership had significant relationships with knowledge sharing. However, direct the relationship between outcome expectations with knowledge sharing was found to be non-significant ($t < 1.96, p > .05$). In terms of the squared multiple correlation (SMC) coefficient of the structural equations that indicates the explanatory power of endogenous variables, 64% and 67% of variances in sense of community and knowledge sharing respectively were explained by the predictor factors.

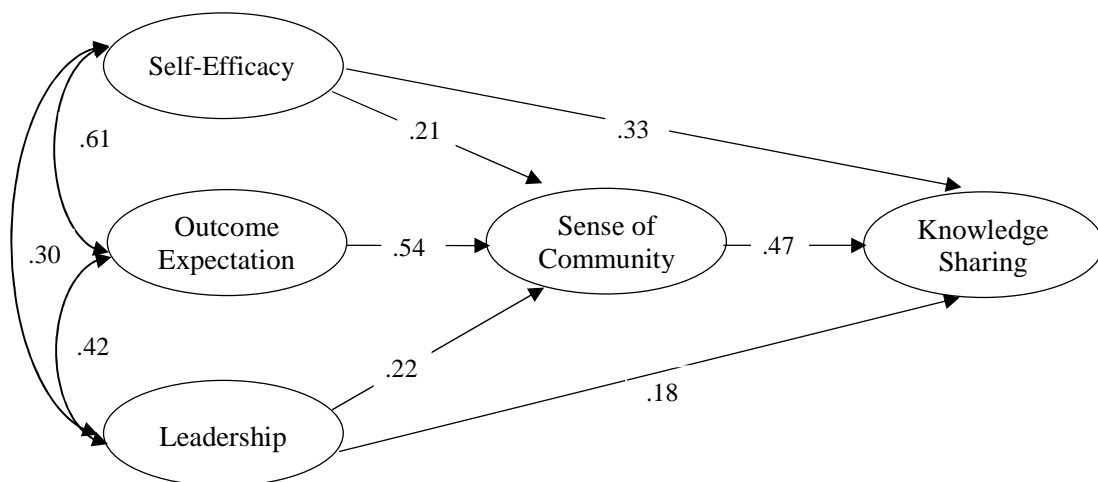


Note: —→ significant path; - - - - -→ non-significant path; standardized estimates.

Figure 7. Hypothesized structural model

Alternative Structural Model 1

In addition to the hypothesized model, several alternative structural models were tested. The alternative models are nested models adding or deleting paths from the hypothesized model. The next model to be compared is a model with one more fixed parameter than the hypothesized model. The direct path from outcome expectations to knowledge sharing in the hypothesized model was not found to be significant. It is likely that by eliminating this path, the model might be a better fit to the data. Thus, the direct path from outcome expectations to the outcome variable, knowledge sharing was eliminated to examine if it would be a better fit to the data. Figure 8 shows the path coefficients and fit indices are presented in Table 9. Overall, this model exhibited a very good fit to the data. Comparing with the hypothesized model, the reduction in fit was mediocre and not significant ($\Delta\chi^2 = 1.62$; $\Delta df = 1$). In terms of SMC, 65% and 67% of variances in sense of community and knowledge sharing were accounted for respectively, indicating a relatively good explanation of the criterion factors. Also, alternative model 1 had a slightly better model fit and all path coefficients were significant ($t > 1.96$, $p < .05$).

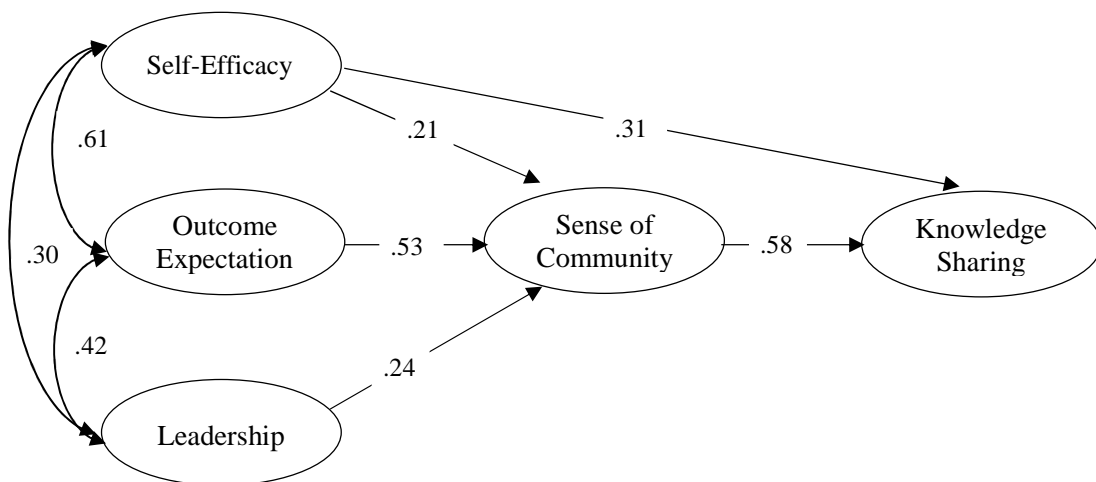


Note: —→ significant path; - - - - -→ non-significant path; standardized estimates.

Figure 8. Alternative structural model 1

Alternative Structural Model 2

Beyond alternative model 1, alternative model 2 additionally eliminated the direct path from leadership of a community to knowledge sharing. Figure 9 demonstrates the strength of the relationships among the constructs, showing path coefficients of the alternative model 2. As in alternative model 1, all path coefficients were significant ($t > 1.96, p < .05$). Compared to the hypothesized model, the reduction in fit indices was larger than it was for alternative model 1 and significant ($\Delta\chi^2 = 12.97; \Delta df = 2$), resulting in less model fit to the data than the hypothesized model. The reduction in fit was found to be significantly worse than alternative model 1. The deletion of the path led to alternative model 2 and clearly it shows it is not fitting well and thus we cannot accept alternative model 2 ($\Delta\chi^2/df = 6.485$).



Note: ———> Significant path; - - - - -> Non-significant path; standardized estimates.

Figure 9. Alternative structural model 2

Model Comparison and Modification

As a more complex model generally presents a better fit than a more parsimonious one, it would be optimal to find a model incorporating only essential parameters both statistically and substantially presenting an acceptable model-data fit at the same time. General guidelines for this decision may include “thorough knowledge of the substantive theory, an adequate assessment of statistical criteria based on information pooled from various indices of fit, and a watchful eye on parsimony” (Byrne, 1994, p.147). In order to select the best model for the data, all of the proposed models, including the hypothesized and two alternative models, were compared based on the following criteria: (a) goodness-of-fit, (b) estimated parameters with theoretical considerations, and (c) the law of parsimony. The fit indices in the three structural models are presented in Table 9 and Table 10 summarizes the path coefficients and the t-values of the paths in the models.

First, the three structural models were compared in terms of the chi-square value as well as the goodness-of-fit indices (CFI, GFI, RMSEA, and RMR). In comparing overall model fit using chi-square statistics, there was no significant difference among the three models. In addition, chi-square/df ratios in the hypothesized model and alternative model 2 (2.70 and 2.86) are larger than that of alternative model 1 (2.67). Given that the smaller the ratio, the better the model fits the data, alternative model 1 demonstrated a slightly better model fit. In regards to other fit indices indicated in Table 9, all models generated acceptable fit indices but alternative model 1 demonstrated better fit indices.

Second, the structural models were compared regarding the strength and significance of the estimated parameters. Table 10 summarizes the path estimates and their t-values. In terms of the strength of the parameters, there were no significant

differences. In terms of statistical fit, Forster (2000) stressed the importance of not adding unnecessary factors whenever possible. The hypothesized model has insignificant path in contrast to alternative model 1 that contains all significant paths. Alternative model 1 also demonstrated a slightly larger parameter estimates as shown in Table 9. According to Anderson and Gerbing (1988), when two models are not significantly different, the one with fewer parameters would be selected. In other words, the one additional parameter in one model was superfluous in that it does not significantly contribute to the explanation of construct variances but costs its associated degree of freedom.

Third, in terms of parsimony, comparing with the hypothesized model, alternative model 1 had smaller number of paths. While the hypothesized model had ten paths, alternative model 1 had nine paths. In summary, while the hypothesized model and the alternative models provide nearly equivalent fits to the data, alternative model 1 was the best in terms of parsimony. In addition, alternative model 1 was accepted as the best model, based on the consideration of the strength and significance of the estimated parameters with theoretical relationships.

The indices suggested that the data fit alternative model 1 adequately. It was hypothesized that self-efficacy, outcome expectations, and leadership of a community would significantly contribute to sense of community and knowledge sharing respectively. The parameter estimates specifying the paths between these variables were statistically significant except the direct path from outcome expectations to knowledge sharing. It was further hypothesized that self-efficacy, outcome expectations, and leadership of a community would significantly and indirectly contribute to knowledge

Table 9

Model Comparisons With Fit Indices for Structural Models

Structural Models	Description	χ^2	df	P	χ^2/df	$\Delta\chi^2$	Δdf	GFI	CFI	RMSEA	RMR
Hypothesized Model	Full model	121.58	45	<.01	2.702	-	-	.954	.971	.062	.011
Alternative Model 1	Full model w/o OE → KS	123.20	46	<.01	2.678	1.62	1	.953	.971	.062	.012
Alternative Model 2	Full model w/o OE → KS & LDS → KS	134.55	47	<.01	2.863	12.97	2	.949	.967	.065	.014

Note. OE=Outcome Expectation, LDS=Leadership of a Community, KS=Knowledge Sharing.

sharing through sense of community. The parameter estimates specifying the indirect paths between these variables were statistically significant.

When judging model fit, the goal is not only to find a model that fits the data best from a statistical point of view, but also takes into consideration that the parameters of the model can be given a substantively meaningful interpretation (Joreskog, 1983). From a theoretical perspective, alternative model 1 has the most explanatory power.

In summary, alternative model 1 was selected as the most adequate model among the three tested structural models that explain the relationships among self-efficacy, outcome expectations, sense of community, leadership of a community, and knowledge sharing, based on statistical and theoretical merits.

Findings

Testing Hypotheses

This section presents the results of the statistical analysis of the surveys completed by 438 members of communities working for one global organization in the Midwest of the U.S. Based on the final model selected, the results of testing hypotheses are presented in this section. The findings are organized by the order of the hypotheses.

The path significance of each hypothesized association in the research model and the variance explained (R^2) by each path are examined. Figure 10 shows the standardized path coefficients. The hypotheses were examined through investigating the path coefficients and the total effect sizes of the constructs in the final model.

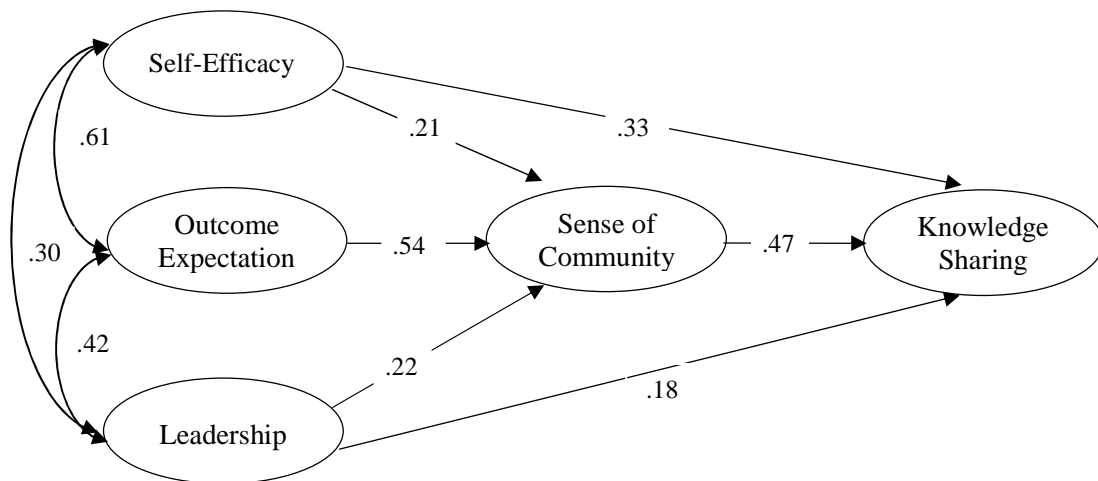
Table 10

Parameter Estimates in Structural Models

	SE → SC	SE → KS	OE → SC	OE → KS	LDS → SC	LDS → KS	SC → KS	SE ↔ OE	SE ↔ LDS	OE ↔ LDS
Hypothesized Model	.21*	.31*	.53*	.12	.22*	.18*	.39*	.61*	.30*	.42*
t-values	(3.80)	(5.46)	(6.78)	(1.28)	(4.63)	(3.46)	(4.33)	(9.49)	(6.66)	(5.66)
Alternative Model 1	.21*	.33*	.54*	-	.22*	.18*	.47*	.61*	.30*	.42*
t-values	(3.76)	(6.10)	(6.89)	-	(4.60)	(3.45)	(6.78)	(9.50)	(5.66)	(6.67)
Alternative Model 2	.21*	.31*	.53*	-	.24*	-	.58*	.61*	.30*	.42*
t-values	(3.77)	(5.69)	(6.89)	-	(5.16)	-	(8.70)	(9.50)	(5.67)	(6.65)

Note. * $p < .05$, SE=Self-Efficacy, OE=Outcome Expectation, SC=Sense of Community, LDS=Leadership of a Community, KS=Knowledge Sharing.

Table 11 summarizes the results of hypotheses testing. The higher gamma (γ) and beta (β), the stronger the relationship is. To be statistically significant, the t -value should be higher than 1.96 ($p < .05$).



Note: —→ significant path; - - - - -→ non-significant path; standardized estimates.

Figure 10. Final model

Hypothesis 1 was that self-efficacy is positively associated with sense of community. Self-efficacy was found to extend a positive influence on sense of community ($\gamma_{11} = .21$; $t = 3.76$; $p < .05$).

Hypothesis 2 predicted a positive relationship between self-efficacy and knowledge sharing. There is a significant path coefficient of .33 from self-efficacy to knowledge sharing and thus hypothesis 2 was supported ($\gamma_{12} = .33$; $t = 6.10$; $p < .05$).

Hypothesis 3 that predicted a positive relationship between outcome expectation and sense of community was supported. Outcome expectation was found to have a strong positive relationship with sense of community ($\gamma_{21} = .54$; $t = 6.89$; $p < .05$). Among the three exogenous factors in the model, outcome expectation exerted the largest impact on

sense of community. This path also showed the largest in terms of the strength of the path coefficient in the final model.

Hypothesis 4 was that outcome expectation is positively associated with knowledge sharing. The direct impact of outcome expectation on knowledge sharing was not significant in the hypothesized model. Total effect of outcome expectation on knowledge sharing appears to be almost entirely mediated by sense of community and thus hypothesis 4 was supported. As the direct path between outcome expectation and knowledge sharing was dropped after testing the hypothesized model, this path was fixed to zero in the final model.

Hypothesis 5 that predicted a positive relationship between leadership of a community and sense of community was supported. Leadership of a community had a significant positive impact on sense of community ($\gamma_{31} = .22, t = 4.6; p < .05$).

Hypothesis 6 was that leadership of a community is positively associated with knowledge sharing. Leadership of a community demonstrated a positive direct impact on knowledge sharing ($\gamma_{32} = .18; t = 3.45; p < .05$) and thus hypothesis 6 was supported.

Hypothesis 7 predicted that sense of community is positively related with knowledge sharing. Sense of community provided a considerable and positive impact on knowledge sharing and thus hypothesis 7 was also supported ($\beta_{11} = .47; t = 6.78; p < .05$). Sense of community found to have the largest impact on knowledge sharing among the variables of the study.

Hypothesis 8 was that the relationship between self-efficacy and knowledge sharing will be mediated by sense of community. Self-efficacy exercised an indirect

effect on knowledge sharing through sense of community (.10). The total effect (direct and indirect effects) of self-efficacy on knowledge sharing was .43 ($p < .05$).

Hypothesis 9 predicted that the relationship between outcome expectation and knowledge sharing will be mediated by sense of community. Outcome expectation exerted an indirect impact on knowledge sharing through the pathway of sense of community and thus hypothesis 9 was supported. The indirect effect of outcome expectation on knowledge sharing (through sense of community) was .26 ($p < .05$).

Hypothesis 10 was that the relationship between perceived leadership of a community and knowledge sharing will be mediated by sense of community. It also exercised an indirect effect on knowledge sharing through sense of community (.10). The total effect (direct and indirect effects) of leadership of a community on knowledge sharing was .28 as shown in Table 11 ($p < .05$).

In addition, as expected, the three exogenous variables of the study, self-efficacy, outcome expectation, and knowledge sharing are correlated. Self-efficacy and outcome expectation had the largest correlation coefficient of .61, followed by a positive relationship between outcome expectation and knowledge sharing (.42). Self-efficacy and knowledge sharing also had a positive relationship (.30).

In summary, the total (direct and indirect) effect of cognitive factors (self-efficacy and outcome expectation) on knowledge sharing was .69, aggregating the direct effect (.33) and the indirect effects (.10+.26). The social factors' (community leadership and sense of community) total effect on knowledge sharing was .75, aggregating the direct effects (.47+.18) and the indirect effect (leadership only, .10).

From the above results, it is concluded that outcome expectation exhibited the largest direct impact on sense of community, followed by leadership of a community and self-efficacy. However, with knowledge sharing, only self-efficacy and leadership had direct impacts on it. Contrary to expectations, the impact of outcome expectation was completely mediated by sense of community. Also, with regard to knowledge sharing in CoPs, sense of community demonstrated the highest direct effect on knowledge sharing, followed by self-efficacy and leadership of a community. Thus, as hypothesized, self-efficacy, outcome expectation, and leadership had indirect effects on knowledge sharing through sense of community.

In addition, since sense of community is expected to increase over time, duration as a member in a community, among other demographic variables, was deemed to influence the relationships of the variables concerned in the structural model. Specifically, in order to examine whether members in different stages exhibited different sense of community and knowledge-sharing behaviors, the potential impact of the variable, membership duration, was added to the structural model as a covariate. As opposed to the initial expectation, the results of the model comparison indicated that adding the covariate duration as a member did not change the size of the path estimates in any substantial way and it was also found to be insignificant on sense of community and knowledge sharing.

Summary

This chapter demonstrated the results of statistical analyses, according to the research questions. First, descriptive statistics were reported. Second, reliability tests and confirmatory factor analyses for the five variables of the study provided statistical support for reliable and valid measures. The quality of factor structure of overall

measurement model was assessed by an overall CFA. Third, in order to find the best model fit to the data, the hypothesized structural model and two nested alternative models were tested and compared. Based on the result of model evaluations, the alternative model 1 was determined to be the best-fit model among the two competing models based on considerations of both statistical fit indices and theoretical foundations. Finally, the proposed hypotheses were examined in light of the final model. As hypothesized, self-efficacy, outcome expectation, and leadership of a community affected sense of community and knowledge sharing positively. Specifically, the final model indicates that approximately 65% of the variance in sense of community can be explained by the three variables. About 67% of the variance in knowledge sharing can be explained by self-efficacy, outcome expectation, sense of community, and leadership of a community. The final model provided empirically and theoretically reasonable explanations for the present data. Consequently, the hypotheses were empirically supported in this study.

Table 11

Hypotheses Testing and Path Estimates

	SE → SC	SE → KS	OE → SC	OE → KS	LDS → SC	LDS → KS	SC → KS
Direct Effects	.21*	.33*	.54*	-	.22*	.18*	.47*
Indirect Effects	-	.10*	-	.26*	-	.10*	-
		(H8: Supported)		(H9: Supported)		(H10: Supported)	
Total Effects	.21*	.43*	.54*	.26*	.22*	.28*	.47*
Results	H1: Supported	H2: Supported	H3: Supported	H4: Supported	H5: Supported	H6: Supported	H7: Supported

Note. * $p < .05$. All estimates are based on the final model. SE=Self-Efficacy, OE=Outcome Expectation, SC=Sense of Community, LDS=Leadership of a Community, KS=Knowledge Sharing. H4: This path was fixed to zero in the final model.

Chapter 5

Discussion

This chapter presents a discussion of the findings and conclusions of the study, followed by theoretical and practical implications of this study. Based on the conclusions drawn from the results, recommendations for future research are also proposed.

This study was designed and developed to gather evidence and support for the discussion about the role of personal cognition and social context for knowledge sharing in online communities of practice, filling an existing void in the literature. There are a number of studies on cognition and on social factors, in fact, as observed in this literature review. However, few initiatives covering the intersection of these topics are readily available yet. The purpose of study was to examine the relationship between personal cognitive factors, social contextual factors, and knowledge-sharing behaviors in online communities of practice. Specifically, this study investigated the impact of (a) self-efficacy, (b) outcome expectation, (c) sense of community, and (d) leadership of a community on (e) knowledge-sharing behaviors. The overarching research question was: To what extent do personal cognitive and social contextual factors in communities influence online knowledge sharing?

The overall claims that each individual has a particular way of sharing knowledge in online communities of practice and that multiple dimensions tend to play roles in the process were underlying this research. Besides the cognitive elements, social components are well known for their potential enablers or inhibitors with knowledge sharing. In this study, particular attention was paid to the joint impact of cognitive and social dynamics

as a source of information to better understand knowledge sharing behaviors in online communities of practice.

Results of the study demonstrated that personal cognitive factors (self-efficacy and outcome expectation) and social contextual factors in a community (sense of community and leadership) jointly contributed to CoPs members' knowledge-sharing behaviors. Overall, 67% of variance in knowledge sharing was explained by self-efficacy, outcome expectation, sense of community, and leadership of a community. About 65% of the variance in sense of community was explained by self-efficacy, outcome expectation, and leadership of a community. Also, series of analyses showed that sense of community has greater impact on knowledge sharing than the other constructs considered in the study. The detailed discussion of the research findings and conclusions drawn from the study in relation to the relevant literature are presented in the following section.

Conclusion

The key conclusion based on all the evidence yielded by this investigation is that both of personal cognition and social context contribute to shape individual community members' knowledge sharing behaviors in online communities of practice. In summary, the hypothesized associations between personal cognition, social context, and knowledge sharing were found in the studied sample of CoPs members. The study results are discussed based on the relationships between the constructs and the two dependent variables, sense of community and knowledge sharing.

Impact of Social-Cognitive Factors on Sense of Community

The first set of research hypotheses (H1, H3, and H5) tested the relationship between the three constructs of the study, self-efficacy, outcome expectation, and leadership of a community and sense of community.

Conclusion 1: Having strong self-efficacy for knowledge sharing was positively related to members' sense of community.

This study investigated the relationship between community members' self-efficacy and sense of community. The results of this study supported the conclusion that self-efficacy has a direct and significant impact on members' sense of community. Although the relationship between sense of community and members' cognitive variables in online CoPs was rarely explored yet, general consistency can be found in results of previous studies. In the self-efficacy literature, there is significant empirical evidence showing a positive relationship between self-efficacy and collective identity (Bonacich & Schneider, 1992; Dholakia et al., 2004), collective efficacy (Lu et al., 2006; Walumbwa et al., 2005), and cooperation (Chen et al., 1996; Kerr, 1992; Van de Kragt et al., 1983). Specifically, individuals who report higher judgment of self-efficacy are more likely to cooperate. The results of the current study confirms the statement that self-efficacy functions as an important set of proximal determinants of human motivation that operates on action through motivational, cognitive, and affective intervening processes (Bandura, 1989).

Conclusion 2: Outcome expectation was found to be the strongest factor conducive to sense of community.

Among the three social-cognitive factors tested as antecedents to sense of community, outcome expectation was found to be the strongest predictor of sense of

community. As Wasko and Faraj's study (2005) showed, people tend to contribute actively to online communities when they perceive that this enhances their professional reputations, and when they feel strong commitment to the community. Although no identified research has yet attempted to examine the relationship between outcome expectation and sense of community, this result clearly supports the conclusion that individual members' outcome expectations are positively associated with sense of community. It is likely that the more outcome expectations members have, the higher sense of community will be. Specifically, the more an individual member has personal and performance outcome expectations for knowledge sharing in the community he or she belongs to, the more likely they are to participate actively in CoPs activities and thus, their sense of community will be higher.

Findings of this study confirm that individual members' personal cognitive factors, including self-efficacy ($\gamma = .21$) and outcome expectation ($\gamma = .54$) were significant to sense of community. In addition, the findings showed that outcome expectation was found to be a stronger predictor of an individual member's sense of community than self-efficacy. This finding strengthens the need for further attention to understand community members' cognitive attributes, expectations, and how shared goals and interests create a sense of belonging, shared norms, and cohesiveness among members of communities. In conclusion, the results of this study provided support for the position that community members' personal cognition is positively associated with their sense of community.

Conclusion 3: Perceived leadership of a community positively influences members' sense of community.

The results of the study indicated that leadership of a community had a direct impact on members' sense of community, showing the significant association between the two constructs ($\gamma = .22$). Many studies have proposed the potential impact of leaders in virtual communities (Fontaine, 2001; Lesser & Storck, 2003; McWilliam, 2000; Vestal, 2006), but virtually no studies have provided empirical evidence yet, let alone any discussions of the optimal leadership style in virtual communities. The findings of this investigation demonstrated empirically that leaders' role for enhancing members' sense of community is critical. Specifically, it showed that when leaders employ their transformational leadership behaviors, their members' sense of community are likely to be strengthened and their knowledge sharing behaviors are likely to be increased. That is, when community members perceive that leaders of a community exhibit enthusiasm to stimulate member involvement and create a climate that is receptive to new ideas, and consider members' needs, members of a community are more likely to feel a sense of belonging and connection to the community and its members.

Results of this study highlighted the importance of leadership of a community in virtual communities setting and support the transformational leadership literature that has linked transformational leadership behaviors and group cohesiveness (Dionne et al., 2003; Hoyt & Blascovich, 2003; Jung & Sosik, 2002; Pillai & Williams, 2004; Rafferty & Griffin, 2004; Sosik et al., 1997; Zhang et al., 2005). Thus, the finding of this study provides the rationale and motivation to suggest community leadership as an enabler for knowledge sharing in the virtual environment. As the very first study that examined the role of transformational leadership in online communities of practice, this study also provides implications for further research and practice by the added layer of the evidence.

The empirical impact of community leadership from this study reinforces that organizations should consider and support community leadership as a strategy for enhancing CoPs members' learning and knowledge sharing.

Impact of Social-Cognitive Factors on Knowledge Sharing

The second set of research hypotheses (H2, H4, H6, and H7) tested the relationship between the four exogenous constructs of the study and the endogenous variable, knowledge sharing.

Conclusion 4: Self-efficacy for knowledge sharing plays a significant role in determining knowledge sharing behaviors in online CoPs.

This study investigated whether community members' self-efficacy for knowledge sharing is a significant predictor of their knowledge sharing behaviors. This study supports the conclusion that self-efficacy impacts community members' knowledge sharing behaviors positively. Prior research in examining the black box of the knowledge-sharing process has tended to view self-efficacy as one of the most salient variables. The finding of this study affirmed the results from a body of research that found a positive contribution of self-efficacy to knowledge sharing (Bok & Kim, 2002; Cabrera et al., 2006; Kankanhalli et al., 2005). That is, the more an individual member has confidence in sharing knowledge, the more actively he or she participates in knowledge sharing. In addition, the implications for self-efficacy is evident in the following comments related to members' knowledge sharing collected through an open-ended question (Appendix C).

My confidence in my knowledge that I can contribute to my community..

The fact that I have knowledge specific to the community in which I am a member and the belief that it will be helpful to others.

In the online knowledge-sharing context, self-efficacy involves the perception of one's ability to make useful contributions and the perceived criticality of these contributions to the provision of useful knowledge through computer-mediated communications. Perhaps the most important cost associated with online knowledge sharing is the vulnerability that may be assumed by revealing one's personal insight in certain organizational contexts. Due to this potential vulnerability, as the results show that, for some people, it might require some levels of affirmation that the knowledge-sharing context is a secured and resourceful place to share their knowledge. Thus, self-efficacy was also found to have an indirect effect on knowledge sharing through sense of community, a mediator in the process. Although no identified empirical research has investigated the role of sense of community as a mediator between self-efficacy and knowledge sharing yet, prior studies that examined relationships with similar constructs of sense of community and knowledge sharing can be found in the literature such as collective efficacy (Kerr, 1992; Lu et al., 2006; Walumbwa et al., 2005), collective identity (Bonacich & Schneider, 1992; Dholakia et al., 2004), and organizational citizenship behaviors (Podskaoff et al., 2000; Yu & Chu, 2007).

Conclusion 5: Outcome expectations might not be transferred to knowledge-sharing behaviors without supports of sense of community.

The results of the study revealed that outcome expectation did not strongly influence knowledge sharing when other social-cognitive factors were taken into consideration. The direct influence of outcome expectation on knowledge sharing was negligible; thus it was found to be relatively less important for knowledge sharing than self-efficacy. But the study also showed that outcome expectation has indirect impact on

knowledge sharing when a mediator, sense of community was considered. This implies that members of CoPs are less likely to participate in knowledge sharing when the components of sense of community were not perceived, even when they have high outcome expectations for knowledge sharing.

According to the expectancy-value theory, people will act in accordance with the expected outcome or with the attractiveness of the outcome (Vroom, 1964). The higher the expectancy and the more the person values the outcome, the more likely the behavior (Butler et al., 2002; Compeau & Higgins, 1999). Given that a member's contributions should benefit the work of other community members, these contributions should also increase the potential value of the gain-sharing bonus the member will receive. This type of solution may have the added benefit of increasing the commitment of members toward their communities, a factor that some experts consider to be a requisite for the creation of intellectual capital (Cox, 2005; Wasko & Faraj, 2000). However, the results of the study indicate that perceived influence or reinforcement of needs may precede individuals' outcome expectation in the virtual environment, where limited affordance prevails. That is, if they do not feel sense of fulfillment of their needs or influence, their initial outcome expectations might not be transferred to actual behaviors of providing and seeking knowledge in the community. This result supports the conclusion that individual members' outcome expectations would not necessarily be expected to affect their knowledge-sharing behaviors without having a strong sense of community. It also reinforces the criticality of social and emotional components of the context in online CoPs and invites further investigation on the specificity of this relationship.

Conclusion 6: Perceived leadership of a community is positively associated with community members' knowledge sharing behaviors.

No previous study has explored the relationship between leadership of a community and knowledge sharing in online CoPs. The result of this study showed that two constructs were found to be moderately and significantly associated (estimated parameter .18). That is, when community members perceive that the leaders of a community provide an intellectual stimulation, individualized consideration, and fostering a community goal, the sub-sets of transformational leadership behaviors (Podskaoff et al., 1990), they are more likely to participate in knowledge sharing in the community. Past conceptual research, suggesting the potential impact of leadership behaviors on online communities (Fontaine, 2001; Koh & Kim, 2003; McWilliam, 2000; Preece, 1999), was supported by the finding of this study. In addition, the implications for community leadership is evident in the following comments related to members' knowledge sharing collected from members' responses to an open-ended question (Appendix C).

My community leader's encouragement to submit ideas and to look for new ways of doing things help me most share my knowledge in this community.

The regular emails seeding and facilitating discussions, and keeping events and activities for us lead me to think about my knowledge I can share with other people in my community.

Because research on leadership in virtual communities of practice is relatively limited yet, this finding strengthens the need for attention to further scholarly discourse and empirical research that explores the essentials of leadership of a virtual community.

These studies could provide HRD professionals with a roadmap indicating the areas of

leadership needed in virtual communities, areas in which to invest their efforts to enhance knowledge sharing in virtual work environments.

Conclusion 7: Sense of a community was found to be the most significant factor contributing to knowledge sharing behaviors.

The results of the study showed that sense of community directly and significantly impacts members' knowledge-sharing behaviors. In fact, among the four social-cognitive factors tested as antecedents to knowledge sharing in CoPs, sense of community had the largest positive impact on knowledge sharing, showing the biggest standardized estimated parameter (.47). This strong association between the two constructs suggests that the more a member of a community perceives (a) the collective identity, (b) fulfillment of needs, (c) influence, and (d) emotional connection to his or her community, the more actively a member participates in sharing knowledge. The findings also indicate that all four dimensions of sense of community favorably contribute to knowledge-sharing behaviors and that sense of community is vital to community members to provide and seek knowledge. In addition, the importance of sense of community in knowledge sharing was confirmed as evidenced by the following comments collected from the respondents (Appendix C).

Feelings that supported and concerns that shared in similar topics, projects, needs, issues, and challenges..

Knowing that this like-minded group of people are facing the same problem and I will get some help in solving my problems..

Familiarity with people in the community, friendliness, professional friendship..

This finding is in line with previous research that emphasized the importance of interpersonal relationships in knowledge sharing (Bok & Kim, 2005; Brodbeck et al.,

2007; Chiu et al., 2006; Lin, 2002; Wasko & Faraj, 2005). However, unlike Bok and Kim's (2005) study that examined the individual factors as parallel antecedents, the findings of this study provided another perspective on the influence of interpersonal relationships on knowledge sharing. That is, as a multifaceted concept, sense of community encompasses not only the interpersonal relationships among members of a community (i.e., membership and shared emotional connection), but it also includes the components of assessment regarding the fulfillment of members' needs and interactive influences among members of a community.

Conclusion 8: The relationships between self-efficacy, outcome expectation, perceived leadership of a community, and knowledge sharing are mediated by sense of community.

It was hypothesized in this study that self-efficacy, outcome expectation, and leadership of a community would indirectly contribute to knowledge sharing through sense of community (H8, H9, and H10). As hypothesized, sense of community showed a larger effect on knowledge sharing rather than members' personal cognitive factors such as self-efficacy and outcome expectation. The results are consistent with research suggesting social factors have a larger affective underpinning in knowledge exchange than cognition-driven (Lee & Choi, 2003). Given the premise that social fabric is a critical element for active knowledge sharing and collective learning (Andrews & Delahaye, 2000; Cox, 2005; Inkpen & Tsang, 2005; Levin & Cross, 2004), the results of this study highlighted the importance of sense of community in online knowledge sharing. The findings suggest that socially contextualized norms and values are more a function of one's behavior than one's personal cognitive factors in virtual communities.

Given that there is little prior research that considered sense of community as a critical variable for knowledge sharing; the findings of this study add an important piece of empirical evidence to the connection between sense of community and knowledge sharing in the virtual environment. Also, this finding strengthens the need for attention to enhance a sense of community and further to create a community culture that is conducive to knowledge sharing. At an organizational level, De Long and Fahey (2000) proposed that the organizational culture is the major enabler or barrier to creating and leveraging knowledge assets. Supported by the finding of this study, at a community level, sense of community can be proposed as the major enabler for mobilizing members of a community toward knowledge through providing and seeking knowledge-sharing behaviors.

Conclusion 9: Community members' personal cognitive factors and social contextual factors jointly contribute to members' knowledge sharing behaviors.

Within the boundary of this study, it was posited that community members' personal cognitive factors and social contextual factors would jointly influence in predicting their knowledge sharing behaviors in online communities of practice. Results for the overall research question provided support of this premise in that they showed a significant contribution to knowledge sharing. When self-efficacy, outcome expectation, sense of community, and leadership joined forces to impact knowledge sharing; approximately 67% of the variance in knowledge sharing was explained. This indicates that the combined four social-cognitive factors are major determinants of knowledge-sharing success in online communities of practice. This reinforces Cross et al.'s (2001) contention that it is progressively more difficult to succeed in knowledge management

without understanding the manifested context of individuals in order to leverage knowledge in the networked organization. Also, this finding strengthens the position held by a number of scholars who have stated that failure to consider individual focused factors usually leads to knowledge management failure (Lee & Choi, 2003; Malhorta, 2002; Martensson, 2000).

Implications for Research and Practice

This study represents the beginning of a process of research to open up new possibilities in the field of online knowledge sharing among global organizational members. As knowledge sharing has been identified as a major focus of knowledge management practices for multinational organizations in today's global knowledge economy, this study is a very timely and important topic for scholars and knowledge management practitioners in the field. Recently, empirical research in this area has been increasing but still much work needs to be done in order to fully uncover the dynamics of knowledge sharing and to encourage employees to use knowledge sharing systems more effectively, thus further making the systems more efficient for organizational knowledge management.

The results of the study have several implications for researchers and practitioners in the area of HRD and KM. The following implications and suggestions emerged, adding knowledge about knowledge sharing that will help HRD and KM professionals maximize the outcomes of their knowledge management initiatives and interventions.

Implications to Researchers

In terms of research implications, this research has at least two contributions: (a) inclusion of community variables and their empirical validation and (b) an integrative

approach encompassing both personal cognitive and social contextual factors for facilitating knowledge sharing.

First, one of the most common and most frequent critiques in the knowledge management literature has been the absence of a holistic perspective on the main actor of knowledge sharing, an individual member in a community of practice. The current study could shed light on the online knowledge sharing literature by introducing and examining multi-factors from an individual member's perspective. Specifically, inclusions of constructs reflecting the community context, sense of community and leadership of a community, contributed to an improved understanding of the dynamics of knowledge sharing in online communities of practice, with their empirical validation.

Second, another accomplishment of this study is its expansion of the social cognitive framework for future research pertaining to online knowledge sharing. Social cognitive theory has been widely used and validated for human behavior in numerous contexts, but it still has not been applied to the knowledge sharing context. This study, aiming to shed light on the knowledge-sharing behavior in virtual communities, marks the first to apply the SCT-based model to investigate the determinants of knowledge-sharing behavior.

In addition, the findings of this study certainly extend invitations to further research on the nature, characteristics, and criticalities of sense of community in a virtual environment. Given that the definition of sense of community was first introduced on the basis of physical location-bound community (Unger & Wandersman, 1985), a revisitation with the concept and its measurement tool developed by McMillan and Chavis (1986) will be needed. Also, given that sense of community could be setting specific, which is

why Hill (1996) called for extensive research in a variety of contexts, a longitudinal study examining how members' sense of community is formed through interactions with a variety of settings will enrich the result of this study. Furthermore, research investigating community culture will further benefit our understanding of the dynamics of community and its knowledge-sharing process.

Implications to Practitioners

In terms of the practical field-oriented implications, the results of this research also provide implications. First, HRD and KM practitioners could design and develop strategies and interventions that facilitate and enhance community members' sense of community. A few interventions that may help to establish and promote a sense of belonging to a knowledge-sharing community include encouraging communication among members by prompting frequent interactions and group identity through group meetings or discussions about a common but pressing topic in the community. Group discussions or meetings have advantages of providing opportunities for members to communicate, thus increasing interactions, cohesiveness, and consequently, helping to keep group identity salient.

Second, persistent efforts for building and fostering a human interaction-based knowledge management system would be another implication for the HRD and KM professionals. As shown in the study, sense of community has an emotional component, and much of its development centers on common interests, goals, values, and principles. In their studies of knowledge sharing, Bonacich and Schneider (1992) found that, once groups were shown to have a common identity, individuals began to share more information. Van Lange et al. (1992) suggested that group identity leads to feelings of

“we-ness” (p. 20). As a form of social control, this group identity has been shown to be a powerful way of maintaining cooperation. Alexrod (1984) argued that the probability of cooperating increases when interactions among participants are frequent and durable. Therefore, given these social and emotional aspects of sense of community, CoPs should be implemented in a cordial atmosphere where members are able to establish familiarity through frequent interactions and easy communication to develop trust based on a sense of belonging to the communities. In addition, HRD and KM professionals can devise and promote virtual collaboration not only via the systematic approach but also through the restructuring approach of the organizational culture and its mental model.

Third, the empirical evidence for community leadership from this study reinforces that organizations should support community leadership as a strategy for enhancing CoPs members’ learning and knowledge sharing. According to Rovai (2002), some organizations think that once they provide a knowledge-sharing system and place it online their job is mostly done, that a community will take care of itself and thrive, and knowledge sharing will occur. However, in the virtual environment, what is likely to happen is that sense of community will whither unless the community is nurtured and support is provided in the form of heightened awareness of a social presence. As this current study showed, sense of community in the virtual space takes on more of the complexion of reciprocal awareness by others of an individual and the individual’s awareness of others to create a mutual sense of interaction. This sense of interaction is essential to the feeling that they belong to the same community. Computer-mediated communications are regarded as less personal and possessing a diminished social presence and contextual cues when compared to face-to-face communication. As social

clues are fewer, social presence is lower, and as social presence is reduced, sense of community is decreased. Thus, there needs to be a facilitating and enhancing mechanism in order to develop and maintain a vibrant community of practice in the virtual environment that fulfills its goal of knowledge sharing. Consequently, leaders of a community must plan on enhancing social presence, group cohesiveness, and community identity within their communities.

From a practical perspective, leaders of a community should assist members to develop a trustful and positive sense of community. When new members participate in a CoP, they may behave according to the expected outcomes and costs incurred by their behaviors. As indicated from the result of this study, initial personal or performance outcome expectations may entice people to join the communities. However, members' initial outcome expectation might not be transferred to their actual participation in the community when they do not feel the strong sense of community. To remove any potential barriers, leaders of a community should facilitate self-regulating policies and establish a collective community identity. For example, leaders need to ensure that members' personal data is secure, let them know this virtual place is well managed, and encourage them to interact with each other. By developing membership and a sense of belonging, members could reduce any potential risks and uncertainty that might discourage knowledge sharing among people. Thus, successful knowledge sharing is a result of perceived community identity and cohesiveness among members. Organizations including HRD and KM professionals need to pay more attention in providing systematic support for leaders and their members of communities for this end.

Recommendation for Future Research

This study has extended the current literature by providing empirical findings based on CoPs members' social contextual understanding of knowledge sharing and advanced knowledge-sharing research toward understanding the complexity of technology-mediated knowledge sharing. Providing sound explanations for knowledge-sharing behaviors by synthesizing the factors that shape individual members' behaviors in the virtual environment is one of the major contributions of this study. Also, this study is one of the earliest empirical studies that examines individuals' sense of community and provides insight into the sense of community-building processes in the virtual environment.

This study also validated the proposed research model, and the findings presented herein respond to the research questions. The findings of this study indicated that the impact of knowledge sharing depends at least in part on its relationship to 'internal' processes, such as self-efficacy and outcome expectation, while also being an integral part of an external social context in which each is embedded within the other at subsequently higher levels of analysis. Thus, an important remark is that the findings of this study suggest that the discussion of knowledge sharing, in particular through computer-mediated tools, should take into consideration elements of multimodality of online knowledge sharing context. In other words, not one factor alone will be as precise as a proper combination when exploring variances of epistemic structure and attributes in explaining members' knowledge sharing behaviors.

The findings of the study open doors for future research. Potentially beneficial future research directions that may lead to further understanding and intervention points in the online knowledge sharing and virtual community development area are suggested.

First, more empirical investigation of online knowledge-sharing is critical. This study sought to identify what social-cognitive variables influence the extent to which community members participate in knowledge-sharing. Studies examining other variables related to knowledge sharing will extend the line of online knowledge sharing and communities of practice research. The presence of other constructs, which could influence the knowledge sharing process within communities such as professional culture and community culture could be assumed. Future research that examines other contextual factors will be important in extending the contextual understanding of knowledge sharing in the virtual environment. In order to have comprehensive understanding of how these variables interactively or independently impact on the individual-focused knowledge sharing context, it is worth while to conduct research that analyze their relative importance towards knowledge sharing with more complex compositions of potential influential constructs and other outcome variables such as job performance. Unfortunately for research purposes, obtaining an objective measure of knowledge sharing and job performance seems to be extremely difficult. If this problem can be overcome, future studies could include the objective measure of knowledge sharing and job performance as outcomes and investigate the relationship between actual behaviors and job performance.

Second, follow-up to the present study would be helpful to further examine members' salient context for knowledge sharing in online communities. This study utilized quantitative methods to examine the relationships among the variables concerned in the study. Based on the nature of the constructs, longitudinal studies are also recommended along with a more observation-oriented qualitative approach. For example,

in-depth interviews can be conducted to further explore members' panoramic experiences of participating in their communities. These follow-up studies would add richness to the current study through providing qualitative information on how members initially perceive their sense of belonging and how their epistemic structure change over the course of interactions with other members and leaders in the virtual environment.

This study examined how social-cognitive factors jointly affected community members' knowledge-sharing behaviors. These behaviors were valued in association with their perceptions of self-efficacy, outcome expectation, sense of community, and leadership of a community. As such, they only validated the members' version of the knowledge-sharing behaviors. Although the individual members' self-assessment answered the questions that this study sought, it would be also beneficial to obtain an objective measure of knowledge-seeking and knowledge-providing behaviors. Thus, the third area of future research could incorporate both objective and subjective data to draw more reliable and valid conclusions about actual online knowledge-sharing behaviors. Specifically, validating knowledge-sharing behaviors with system-generated data and comparing them with the results of self-reported data is a venue in needs of further exploration to better understand online knowledge-sharing behaviors.

Fourth, more empirical investigation of the impact of transformational leadership behaviors in virtual communities is called for. As the first study examining the impact of community leadership on knowledge sharing in online communities of practice, this study adopted transformational leadership as a framework. As previous studies that have identified transformational leadership as effective in augmenting group cohesiveness in a virtual team environment (Hoyt & Blascovich, 2003; Sosik, Avolio, Kahai, & Jung,

1998), the results of this study confirmed the positive impact of transformational leadership behaviors on sense of community and knowledge sharing. This study, however, unlike most of the current experimental research in virtual team leadership, did not employ any confederate leaders to ensure that they exerted transformational leadership behaviors. Certainly replication or follow-up to the present study will be helpful to identify what transformational leadership factors result in different levels of sense of community and knowledge sharing behaviors. Additionally, in a more applied vein, future research may investigate other leadership styles that have been studied in the virtual team literature such as shared leadership (Conger & Pearce, 2003; Pearce, 2004), or emergent leadership (Tyran, Tyran, & Shepherd, 2004). Hence, understanding how community leadership impacts upon community members' behaviors may provide HRD professionals with significant practice knowledge on developing community-level interventions to facilitate their learning and knowledge sharing, thus performance.

Fifth, further studies will be needed to expand the data sources to include different types of industry and organizations. The results of the current study were derived only from one organization in the manufacturing industry. Although the responses were collected from different areas across the organization, the extension of the population to different types of organizations will expand the generalizability of the study results. Depending on the type of industry, the employees might show different patterns of knowledge exchange. Also, as organizational culture, in general, has been argued to be a critical factor influencing knowledge sharing (Grotenhuis & Weggeman, 2002; Gupta & Govindarajan, 2000; Inkpen & Dinur, 1998; Yang, 2004), different types of industry and their cultures may be considered for future research. This diversity of the sample sources

will also contribute to increase the reliability of the results. Furthermore, comparison analysis among those samples may result in interesting further discussions. Those further studies would be valuable to understand unique approaches depending on the differences of the organizational cultures in terms of the application of the proposed framework and for organizational learning and development purposes.

Another area of future research could be cross-cultural studies on knowledge sharing in global virtual communities. Although this current study was conducted in a multinational organization, cultural differences were not considered as potential factors on knowledge sharing. Future studies need to examine if the factors that constitute effective knowledge sharing are the same in other cultures. This investigation will help us not only to understand knowledge sharing in different cultures, but also to examine how cultural factors play a role in developing and changing a sense of community in global virtual communities.

Finally, this research only focused on knowledge sharing through one specific system in one organization. Although community systems, mostly reside in a larger KM system of an organization, provide a good channel for knowledge sharing in a networked organization, a few forwarding organizations are adopting Web 2.0 technologies into their KM system to cope with employees' needs and trends of communication. Thus, besides the current community systems, future research could examine online knowledge sharing by combining any levels of utilization of other social computing tools or any other emerging technologies. As these tools are transforming the direction and emphasis of knowledge management, it will be valuable to include these emerging tools in the scope of knowledge-sharing research to understand how these tools shape knowledge

seeking, providing, and creation, particularly with the new generation of Millennials (those born between 1980 and 2000) entering the workforce (Brown, 2007).

Certainly, results from new investigations designed based on any of these perspective can also inform more studies in this area, while aiming at uncovering the entire online knowledge sharing and creation landscape.

References

- Abrams, C., Cross, R., Lesser, E. & Levin, D. (2003). Nurturing interpersonal trust in knowledge-sharing networks. *Academy of Management Executive*, 17(4), 64–77.
- Ahuja, M., & Galvin, J. (2003). Socialization in virtual groups. *Journal of Management*, 29(3), 161-185.
- Alavi, M., & Leidner, D. E. (2001). Review: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, 25(1), 107-136.
- Alazmi, M., & Zairi, M. (2003). Knowledge management critical success factors. *Total Quality Management & Business Excellence*, 14(2), 199-205.
- Allee, V., & Taug, J. (2006). Collaboration, innovation, and value creation in a global telecom. *Learning Organization*, 13(6), 569-578.
- Alvesson, M. (2004). *Knowledge Work and Knowledge-Intensive Firms*. Oxford University Press, Oxford.
- Anand, N., Gardner, H. & Morris, T. (2007). Knowledge-based innovation: Emergence and embedding of new practice areas in management consulting firms. *Academy of Management Journal*, 50(2), 406–428.
- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411-423.
- Andrews, D. (2002). Audience-specific online community design. *Communications of the ACM*, 45(4), 64–68.
- Andrews, D., Preece, J., & Turoff, M. (2002). A conceptual framework for demographic groups resistant to on-line community interaction. *International Journal of Electronic commerce*, 6(3), 9–24.
- Andrews, K. M., & Delahaye, B. L. (2000). Influences of knowledge process in organizational learning: The psychosocial filter. *Journal of Management Studies*, 37(6), 797-811.
- Andriessen, J. (2005). Archetypes of knowledge communities. In P. Besselaar, G. Michelis, J. Preece & C. Simons (Eds.), *Communities and technologies: the second communities and technologies conference* (pp. 191-213). Milano.
- Ardichvili, A. (2002). Knowledge management, HRD, and the Internet technology. *Advances in Developing Human Resources*, 4(4), 451-463.

- Ardichvili, A. (2003). Constructing socially situated learning experiences in human resource education: An application of the Vygotskian activity theory. *Human Resource Development International*, 6(1), 5-20.
- Ardichvili, A. (2008). Learning and Knowledge Sharing in Virtual Communities of Practice: Motivators, Barriers, and Enablers. *Advances in Developing Human Resources*, 10(4). 541-554.
- Ardichvili, A., Maurer, M., Li, W., Wentling, T., & Stuedemann, R. (2006). Cultural influences on knowledge sharing through online communities of practice. *Journal of Knowledge Management*, 10(1), 94-107.
- Ardichvili, A., Page, V., & Wentling, T. (2003). Motivation and barriers to participation in virtual knowledge-sharing communities of practice. *Journal of Knowledge Management*, 7(1), 64-77.
- Argote, L. (1999). *Organizational learning: creating, retaining and transferring knowledge*. Kluwer, Norwell, MA.
- Argote, P., & Ingram. (2000). Knowledge transfer in organizations: A basis for competitive advantage in firms. *Organizational Behavior Human Decision Processes*, 82(3), 150-169.
- Augier, M., Shariq, S. Z., & Vendelo, M. T. (2001). Understanding context: Its emergence, transformation and role in tacit knowledge sharing. *Journal of Knowledge Management*, 5(2), 125-136.
- Awamleh, R., Evans, J., & Mahate, A. (2005). A test of transformational and transactional leadership styles on employees' satisfaction and performance in the UAE banking sector. *Journal of Comparative International Management*, 8(1), 3-20.
- Bandura, A. & Locke, E.A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88(1), 87-99.
- Bandura, A. & Wood, R. (1989). Impact of conceptions of ability on self-regulatory mechanisms and complex decision making. *Journal of Personality and Social Psychology*, 56 (3), 407-15.
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice Hall, Englewood Cliffs, NJ.
- Bandura, A. (1997). *Self-efficacy: The Exercise of Control*. Freeman, New York, NY.
- Barab, S. A., Kling, R., & Gray, J. (2004). *Designing for virtual communities in the service of learning*. Cambridge, MA: Cambridge University Press.

- Barab, S. A., MaKinster, J., & Scheckler, R. (2003). Designing system dualities: Characterizing online community. To appear in S. Barab, R. Kling, & J. Gray (Eds.), *Designing for virtual communities in the service of learning*. Cambridge: Cambridge University Press.
- Bartol, K.M. & Srivastava, A. (2002). Encouraging knowledge sharing: The role of organizational reward systems. *Journal of Leadership & Organizational Studies*, 9(1), 64-77.
- Bass, B. M. & Avolio, B. J. (1990). The implications of transactional and transformational leadership for individual, team, and organizational development. *Research in Organizational Change and Development*, 4, 231-272.
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. Free Press: New York.
- Bass, B. M. (2000). The future of leadership in learning organizations. *Journal of Leadership Studies*, 7, 18-40.
- Bass, B. M., Avolio, B. J, Jung, D, & Berson, Y. (2003). Predicting unit performance by assessing transformational and transactional leadership. *Journal of Applied Psychology*, 88, 207-218.
- Bergquist, M. & Ljungberg, J. (2001). The power of gifts: organizing social relationships in open source communities, *Information Systems Journal*, 11(4), 305-320.
- Bhagat, R. S., Kedia, B., Harveston, P., & Triandis, H. (2002). Cultural variations in the cross-border transfer of organizational knowledge: an integrative framework. *Academy of Management Review*, 27(2), 204-221.
- Biesta, G.. J., & Burbules, N. C. (2003). *Pragmatism and Educational Research*, NY: Rowman & Littlefield Publishers, Inc.
- Bloomer, M., & Hodkinson, P. (2000). Learning careers: continuity and change in young people's dispositions to learning. *British Educational Research Journal*, 26(5), 583-597.
- Bock, G. W., & Kim, Y. G. (2002). Breaking the myths of rewards: an exploratory study of attitudes about knowledge sharing. *Information Resource Management Journal*, 15(2), 14-21.
- Bock, G. W., Zmud, R. W., Kim, Y. G., & Lee, J. N. (2005). Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological factors, and organizational climate. *MIS Quarterly*, 29(1), 87-111.
- Boland, R., & Tenkasi, R. (1995). Perspective making and perspective taking in communities of knowing. *Organization Science*, 6(4), 350-372.

- Bollen, K. A. (1989). *Structural Equations with Latent Variables*. New York: John Wiley.
- Bresman, H., Birkinshaw, J., & Nobel, R. (1999). Knowledge transfer in international acquisitions. *Journal of International Business Studies*, 30(3), 439-462.
- Brown, J. C. (2002). How does your knowledge flow? *CSC World, Spring/Summer*, 12-17.
- Brown, J. S., & Duguid, P. (1991). Organizational learning and communities of practice: toward a unified view of working, learning, and innovation. *Organization Science* 2(1), 40-57.
- Brown, J. S., & Duguid, P. (2000). *The Social Life of Information*. Harvard Business School, Cambridge, MA.
- Brown, J. S., & Duguid, P. (2001). Knowledge and organization: A social-practice perspective. *Organization Science*, 12(2), 198-213.
- Brown, M. (2007). *Social computing upends past knowledge management archetypes*. Cambridge, MA: Forrester Research, Inc.
- Byrne, B. M. (1994). Testing for the Factorial Validity, Replication, and Invariance of a Measuring Instrument: A Paradigmatic Application Based on the Maslach Burnout Inventory. *Multivariate Behavioral Research*, 29, 289-311.
- Byrne, B. M. (2001). *Structural equation modeling with Amos: Basic concepts applications, and programming*. Mahwah, NJ: Erlbaum.
- Bryant, S. E. (2003). The role of transformational and transactional leadership in creating, sharing and exploiting organizational knowledge. *Journal of Leadership & Organizational Studies*, 9(4), 32-44.
- Burnette, J., & Williams, L. J. (2005). Structural equation modeling (SEM): An introduction to basic techniques and advanced issues. In R. A. Swanson & E. F. Holton III (Eds.), *Research in organizations: Foundations and methods of inquiry* (pp. 143-160). CA: Berrett-Koehler Publishers.
- Burton, C., & Schwen, T. M. (2003). Toward the validation of Ba. *Performance Improvement Quarterly*, 16(2), 41-67.
- Butler, B., Sproull, L., Kiesler, S., & Kraut, R. (2002). Community effort in online groups: who does the work and why, in: S. Weisband, L. Atwater (Eds.), *Leadership at a Distance*, Lawrence Erlbaum Publishers, Mahwah, NJ.
- Bycio, P., Hackett, R. D., & Allen, J. S. (1995). Further assessments of Bass' (1985) conceptualization of transactional and transformational leadership. *Journal of Applied Psychology*, 80, 468-478.

- Cabrera, A. & Cabrera, E. F. (2002). Knowledge sharing dilemmas. *Organization Studies*, 23(5), 687–710.
- Cabrera, E. F. & Cabrera, A. (2005). Fostering knowledge sharing through people management practices. *International Journal of Human Resource Management*, 16(5), 270–735.
- Cavusgil, S. T., Calantone, R. J., & Zhao, Y. (2003). Tacit knowledge and firm innovation capability. *Journal of Business & Industrial Marketing*, 18(1), 6-21.
- Chavis, D.M., Hogge, J.H., McMillan, D.W., & Wandersman, A. (1986). Sense of community through Brunswick's lens: A first look. *Journal of Community Psychology*, 14(1), 24-40.
- Chin, W. W., Salisbury, W. D., Pearson, A. W., & Stollak, M. J. (1999). Perceived Cohesion in Small Groups: Adapting and Testing the Perceived Cohesion Scale in a Small Group Setting. *Small Group Research*, 30(6), 751-766.
- Chipuer, H. M., & Pretty, G. M. H. (1999). A review of the Sense of Community Index: Current uses, factor structure, reliability, and further development. *Journal of Community Psychology*, 27(6), 643-658.
- Chiu, C., Hsu, M., & Wang, E. (2006). Understanding knowledge sharing in virtual communities: An integration of social capital and social cognitive theories. *Decision Support Systems*, 42(3), 1872-1888.
- Chowdhury, S. (2005). The role of affect- and cognition-based trust in complex knowledge sharing. *Journal of Managerial*, 17(3), 310–326.
- Compeau, D. R., & Higgins, C. A. (1995). Application of social cognitive theory to training for computer skills. *Information Systems Research*. 6(2), 118–143.
- Compeau, D. R., & Higgins, C. A. (1999). Social cognitive theory and individual reactions to computing technology: a longitudinal study. *MIS Quarterly*. 23(2), 145–158.
- Conger, J. A., & Kanungo, R. N. (1988). The Empowerment Process: Integrating Theory and Practice. *Academy of Management Review*. 13(3), 471-482.
- Cross, R., Rice, R. E., & Parker, A. (2001). Information seeking in social context: Structural influences and receipt of information benefits. *IEEE Transactions on Systems, Man, and Cybernetics—Part C: Applications and Reviews*, 31(4), 438-448.
- Cummings, J. L., & Teng, B. S. (2003). Transferring R&D knowledge: The key factors affecting knowledge transfer success. *Journal of Engineering and Technology Management*, 20, 39-68.

- Daniel, B. K., Sarkar, A., & O'Brien, D. (2004). A participatory design approach for a distributed community of practice in governance and international development. *Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications*, Lugano, Switzerland.
- Darroch, J. (2005). Knowledge management, innovation and firm performance. *Journal of Knowledge Management*, 9(3), 101–115.
- Davenport, E., & Hall, H. (2002). Organizational knowledge and communities of practice. *Annual Review of Information Science and Technology*, 36, 171-227.
- Davenport, T. H., & Prusak, L. (1998). *Working knowledge*. Boston, MA: Harvard Business School Press.
- Davenport, T. H., DeLong, D. W., & Beers, M. C. (1998). Successful knowledge management projects. *Sloan Management Review*, 39(2), 43-57.
- De Long, D. W., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *Academy of Management Executive*, 14(4), 113-127.
- Dennen, V. P. & Wang, M. (2002). The keyboard-based job coach: informal learning via the Internet. *Advanced in Developing Human Resources*, 4(4), 440-450.
- Diamantopoulos, A., & Sigauw, J. A. (2000). *Introducing LISREL*. London, UK: Sage Publications.
- Dholakia, U. M., Bagozzi, R. P., & Pearo, L. K. (2004). A social influence model of consumer participation in network- and small-group based virtual communities. *International Journal of Research in Marketing*, 21(3), 241–263.
- Donaldson, A., Lank, E. & Maher, J. (2005). Connecting through communities: how a voluntary organization is influencing healthcare policy and practice. *Journal of Change Management*, 5(1), 71-85.
- Dvir, T., Eden, D., Avolio, B., & Shamir, B. (2002). Impact of transformational leadership on follower development and performance: A field experiment. *Academy of Management Journal*, 45, 735-744.
- Easterby-Smith, M., Snell, R., & Gherardi, S. (1998). Organizational learning: diverging communities of practice? *Management Learning*, 29(3), 259-272.
- Ellis, D., Oldridge, A., & Vasconcelos, A. (2005). Community and virtual community. *Annual Review of Information Science and Technology*, 38(1), 145 - 186.
- Endres, M. L., Endres, S. P., Chowdhury, S. K., & Alam, I. (2007). Tacit knowledge sharing, self-efficacy theory, and application to the Open Source community. *Journal of Knowledge Management*, 11(3), 92-103.

- Engeström, Y. (2001). Expansive learning at work: Toward an activity theoretical reconceptualization. *Journal of Education and Work, 14*(1), 133-156.
- Feng, K., Chen, E. T., & Liou, W. (2005). Implementation of knowledge management systems and firm performance: An empirical investigation. *Journal of Computer Information Systems, 45*(2), 92-104.
- Fernandes, C., & Awamleh, R. (2004). The impact of transformational and transactional leadership styles on employee's satisfaction and performance: An empirical test in a multicultural environment. *International Business and Economics Research Journal, 3*(8), 65-76.
- Figallo, C. (1998). *Internet World: Hosting Web Communities*. New York: John Wiley & Sons.
- Fontaine, M. (2001). Keeping communities of practice afloat. *Knowledge Management Review, 4*(4), 16-21.
- Ford, D. P., & Chan, Y. E. (2003). Knowledge sharing in a multi-cultural setting: A case study. *Knowledge Management Research and Practice, 1*(1), 11-27.
- Friedman, T. L. (2006). *The world is flat: a brief history of the twenty-first century*. New York: Farrar, Straus and Giroux.
- Furlong, J., & Johnson, L. (2003). Communities of practice and metacapabilities. *Knowledge Management Research & Practice, 1*(3), 102-112.
- Garavan, T. N., Carbery, L., & Murphy, E. (2007). Managing intentionally created communities of practice for knowledge sourcing across organizational boundaries; Insights on the role of the CoP manager. *Learning Organization, 14*(1), 34-48.
- Garavelli, A. C., Gorgoglione, M., & Scozzi, B. (2002). Managing knowledge transfer by knowledge technologies. *Technovation, 22*(5), 269-279.
- Garrison, D. R. (2005). *Learning collaboration principles*. Paper presented for the Sloan-C Summer Workshop, Victoria, BC, Canada.
- Gersting, C., Gordon, D., & Ives, B. (2000). A human performance approach to knowledge management. In D. Bonner (Ed.), *In Action: Leading Knowledge Management and Learning* (pp. 23-38). Washington, DC: American Society for Training and Development.
- Gibson, C. B., & Cohen, S. G. (2003). *Virtual teams that work, Creating Conditions for Virtual teams Effectiveness*. San Francisco: Jossey-Bass.
- Gist, M.E. & Mitchell, T.R. (1992). Self-efficacy: a theoretical analysis of its determinants and malleability. *Academy of Management Review, 17*(2), 183-211.

- Gourlay, S. (2001). Knowledge management and HRD. *Human Resource Development International*, 4(1), 27-46.
- Grace, A., & Butler, T. (2005). Beyond Knowledge Management: Introducing Learning Management Systems. *Journal of Cases on Information Technology*, 7(1), 53-70.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W.C. (1998). *Multivariate data analysis with readings*. (5th Ed.). Prentice Hall, Upper Saddle River, New York.
- Hair, J. F., Babin, B. J., Anderson, R. E., Tatham, R. L., & Black, W.C. (2006). *Multivariate data analysis*. (6th Ed.). Upper Saddle River, New Jersey: Pearson Education.
- Hamilia, S. (2001). Shell created communities of practice. *KM World*, 19, 1-2.
- Handley, K., Sturdy, A., Fincham, R. & Clark, T. R. (2006). Within and Beyond Communities of Practice: Making Sense of Learning Through Participation, Identity and Practice. *Journal of Management Studies*, 43(3), 641-653.
- Hansen, M. T. (2002). Knowledge networks: Explaining effective knowledge sharing in multiunit companies. *Organization Science*, 13(3), 232-248.
- Hanssen-Bauer, J., & Snow, C. (1996). Responding to hypercompetition: The structure and processes of a regional learning network organization. *Organization Science*, 7(4), 413-427.
- Harasim, L., Hiltz, S., Teles, L., & Turoff, M. (1998). *Learning networks: a field guide to teaching and learning online*. Cambridge, Massachusetts: The MIT Press.
- Harvard Business Review. (1998). *On knowledge management*. Boston, MA: Harvard Business School Publishing.
- Heier, H., Borgman, H. P. & Manuth, A. (2005). Siemens: Expanding the knowledge management system ShareNet to Research & Development. *Journal of Cases on Information Technology*, 7(1), 92-107.
- Henriks, P. (1999). Why share knowledge? The influence of ICT on the motivation for knowledge sharing. *Knowledge and Process Management*, 6(2), 91-100.
- Hertel, G., Niedner, S., & Herrmann, S. (2003). Motivation of software developers in Open Source projects: an Internet-based survey of contributors to the Linux kernel. *Research Policy*. 32(7), 1159-1177.
- Hildreth, P., & Kimble, C. (2002). The duality of knowledge. *Information Research*, 8(1), 13-29.
- Hildreth, P., Kimble, C., & Wright, P. (2000). Communities of practice in the distributed international environment. *Journal of Knowledge Management*, 4(1), 27-38.

- Hinds, J. P., & Pfeffer, J. (2003). Why organizations don't "know what they know": cognitive and motivational factors affecting the transfer of expertise. In Ackerman, M. S., Pipek, V., & Wulf, V. (Eds.) *Sharing expertise: beyond knowledge management*, Cambridge, Mass: MIT Press.
- Hislop, D. (2003). Linking human resource management and knowledge management via commitment. *Employee Relations*, 25(2), 182-202.
- Hoadley, C. M., & Pea, R. D. (2002). Finding the ties that bind: tools in support of a knowledge-building community. In K. A. Renninger & W. Shumar (Eds.), *Building virtual communities: Learning and change in cyberspace* (pp. 321-354). New York: Cambridge University Press.
- Hovath, L., & Tobin, T. J. (1999). *Twenty-first century teamwork: Defining competencies for virtual teams*. Paper presented at the 1999 Academy of Management Conference, Chicago, IL.
- Hu, L. T., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 76-99). Thousand Oaks, CA: Sage.
- Huber, G. P. (2001). Transfer of knowledge in knowledge management systems. *Journal of Management Studies*, 10(2), 72-29.
- Hung, D., Chee, T. S., Hedberg, J. G., & Seng, K. T. (2005). A framework for fostering a community of practice: scaffolding learners through an evolving continuum. *British Journal of Educational Technology*, 36(2), 159-176.
- Huseman, R. C., & Goodman, J. P. (1999). *Leading with knowledge: The nature of competition in the Twenty-First century*. Thousand Oaks, CA: Sage.
- Husted, K., & Michailova, S. (2002). Knowledge sharing in Russian companies with western participation. *Management International*, 6(2), 17-28.
- Hutchings, K., & Michailova, S. (2004). Facilitating knowledge sharing in Russian and Chinese subsidiaries: the role of personal networks and group membership. *Journal of Knowledge Management*, 8(2), 84-94.
- Huysman, M., & De Wit, D. (2002). *Knowledge sharing in practice*. Kluwer Academic Publishers.
- Jashapara, A. (2003). Cognition, culture and competition: an empirical test of the learning organization. *The Learning Organization*, 10(1), 31-50.
- Jashapara, A. (2005). The emerging discourse of knowledge management: a new dawn for information science research ? *Journal of Information Science*, 31 (2), 136-48.

- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, 30 (2), 199-218.
- Johnson, C. M. (2001). A Survey of current research on online communities of practice. *Internet and Higher Education*, 4, 45-60.
- Johnson, R. D., & Marakas, G. M., (2000). Research report: the role of behavioral modeling in computer skills acquisition—toward refinement of the model. *Information Systems Research*, 11 (4), 402–417.
- Jöreskog, K. G. (1983). Factor analysis as an error-in-variables model. In H. Wainer, & S. Messick (Eds.), *Principles of modern psychological measurement* (pp. 185-196). Hillsdale, NJ: Erlbaum.
- Kalling, T., & Styhre, A. (2003). *Knowledge Sharing in Organizations*, Copenhagen Business School Press, Copenhagen, Denmark.
- Kanawattanachai, P., & Yoo, Y. (2002). Dynamic nature of trust in virtual teams. *Journal of Strategic Information Systems*, 11, 187-213.
- Kankanhalli, A., Tan, B.C., Wei, K.K. (2005). Contributing knowledge to electronic knowledge repositories: an empirical investigation, *MIS Quarterly*, 29(1), 113-143.
- Kayes, A. B., Kayes, D. C., & Yamazaki, Y. (2005). Transferring knowledge across cultures: A learning competencies approach. *Performance Improvement Quarterly*, 18(4), 87-100.
- Kerr, N. L. (1992). Efficacy as a causal and moderating variable in social dilemmas. W.B.G. Liebrand, D.M. Messick, and H.A.M Wilkek (Eds.), *Social Dilemmas: Theoretical Issues and Research Findings*. New York: Pergamon Press.
- Kimble, C., & Hildreth, P. (2005). Dualities, distributed communities of practice and knowledge management. *Journal of Knowledge Management*, 9(4), 102-113.
- Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling*. New York: Guilford.
- Koh, J., & Kim, Y. G. (2003). Sense of virtual community: A conceptual framework and empirical validation. *International Journal of Electronic Commerce*, 8(2), 75-92.
- Koh, J., & Kim, Y. G. (2004). Knowledge sharing in virtual communities: an e-business perspective. *Expert Systems with Applications*, 26, 155-166.
- Kohlbacher, F., & Mukai, K. (2007). Japan's learning communities in Hewlett-Packard consulting and integration: challenging one-size fits all solutions. *Learning Organization*, 14(1), 8-20.

- Kolekofski, K.E., & Heminger, A.R. (2003). Beliefs and attitudes affecting intentions to share information in an organizational setting. *Information & Management*, 40(6), 521–532.
- Koschmann, T. (1996). *CSCL: Theory and Practice of an Emerging Paradigm*. Mahwah, NJ: Lawrence Erlbaum.
- Kuuti, K. (1996). Activity theory as a potential framework for human-computer interaction research. In B. A. Nadi (Ed.), *Context and consciousness: Activity theory and human computer interaction* (pp. 17-44). Cambridge, MA: MIT press.
- Kwok, J., & Gao, S. (2004). Knowledge sharing community in P2P network: a study of motivational perspective. *Journal of Knowledge Management*, 8(1), 94-102.
- Lam, J., & Lee, M. (2005). Bridge the digital divide—the role of internet self-efficacy towards learning computer and the internet among elderly in Hong Kong, China. *Proceedings of the 38th Hawaii International Conference on System Science*, 1-10.
- Langerak, F., Verhoef, P.C., & Verlegh, K. de Valck. (2004). Satisfaction and participation in virtual communities. *Advances in Consumer Research*, 31, 56–57.
- Larsen, K. R., & McInerney, C. R. (2002). Preparing to work in the virtual organization. *Information & Management*, 39, 23-47.
- Larsson, R., Bengtsson, L., Henriksson, K., & Sparks, J. (1998). The interorganizational learning dilemma: Collective knowledge development in strategic alliances. *Organization Science*, 9(4), 285–305.
- Lave, J. & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. Cambridge; New York: Cambridge University Press.
- Lave, J. (1988). *Cognition in practice: Mind, mathematics, and culture in everyday life*. New York: Cambridge.
- Lee, H., & Choi, B. (2003). Knowledge management enablers, processes, and organizational performance: An integrative view and empirical examination. *Journal of Management Information Systems*, 20(1), 179-228.
- Lengnick-Hall, M. L. & Lengnick-Hall, C. A. (2003). *Human Resource Management in the Knowledge Economy*. San-Francisco: Berrett-Koehler Publishers.
- Leonard, D., & Sensiper, S. (1998). The role of tacit knowledge in group innovation. *California Management Review*, 40(3), 112-132.
- Lesser, E. L., & Storck, J. (2001). Communities of practice and organizational performance. *IBM Systems Journal*. 40(4), 831-841.

- Lesser, E. L. (2000). Leveraging social capital in organizations. E.L. Lesser (Ed.), *Knowledge and Social Capital: Foundations and Applications*. Butterworth Heinemann, Woburn, MA.
- Levin, D. Z., & Cross, R. (2004). The strength of weak ties you can trust: The mediating role of trust in effective knowledge transfer. *Management Science*, 50(11), 1477-1490.
- Liedtka, J. (1999). Linking competitive advantage with communities of practice. *Journal of Management Inquiry*, 8(1), 5-16.
- Lin, H. & Lee, G. (2004). Perceptions of senior managers toward knowledge-sharing behavior. *Management Decision*, 42(1), 108-25.
- Lipponen, L. (2002). Exploring foundations for computer-supported collaborative learning. In G. Stahl (Ed.), *Proceedings of CSCL 2002: Computer support for collaborative learning* (pp. 72-81). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Lu, L., Leung, K., & Koch, P. T. (2006). Managerial Knowledge Sharing: The Role of Individual, Interpersonal, and Organizational Factors. *Management and Organization Review*, 2(1), 15-41.
- Lurey, J. S., & Raisinghani, M. S. (2001). An empirical study of best practices in virtual teams. *Information & Management*, 38, 523-544.
- Maki-Komsi, S., Poyry, P., & Ropo, E. (2005). Learning and knowledge building in distributed work environment. *The Electronic Journal for Virtual Organizations and Networks*, 7, 34-53.
- Malhotra, A., & Majchrzak, A. (2004). Enabling knowledge creation in far-flung teams: best practices for IT support and knowledge sharing. *Journal of Knowledge Management*, 8(4), 75-86.
- Malhotra, Y. (2002). Why knowledge management systems fail? Enablers and constraints of knowledge management in human enterprises. In Holsapple, C.W. (Ed.), *Handbook on Knowledge Management 1: Knowledge Matters*. Springer-Verlag, Heidelberg, Germany, 577-599.
- Malone, T. W., Laubacher, R., & Morton, M. S. (2003). *Inventing the Organizations of the 21st Century*. Cambridge, MA: MIT Press.
- Marquardt, M., & Berger, N. (2003). The Future: Globalization and new roles for HRD. *Advances in Developing Human Resources*, 5(3), 283-295.
- Martensson, M. (2000). A critical review of knowledge management as a management tool. *Journal of Knowledge Management*, 4(3), 204-216.

- Massey, A. P., Montoya-Weiss, M. M., & O'Driscoll, T. M. (2005). Human performance technology and knowledge management: A case study. *Performance Improvement Quarterly*, 18(2), 37-55.
- McDermott, R. (1999). Learning across teams: The role of communities of practice in team organizations. *Knowledge Management Review*, 7(3).
- McDermott, R., & O'Dell, C. (2001). Overcoming cultural barriers to sharing knowledge. *Journal of Knowledge Management*, 5(1), 76-85.
- McDonald, R.P., & Ho, M.R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7(1), 64–82.
- McEvily, B., Perrone, V., & Zaheer, A. (2003). Trust as an organization principle. *Organization Science*, 14(1), 91–103.
- McLure, M., & Faraj, S. (2000). “It is what one does”: Why people participate and help others in electronic communities of practice. *The Journal of Strategic Information Systems*, 9(2/3), 55-173.
- McLure-Wasko, M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29(1), 35-57.
- McMillan, D.W., & Chavis, D.M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology*, 14(1), 6–23.
- McWilliam, G. (2000). Building stronger brands through online communities. *SloanManagement Review*, 41(3), 43-55.
- Michailova, S., & Husted, K. (2003). Knowledge sharing in Russian companies with Western participation. *Management International*, 6(2), 19-28.
- Mittendorff, M., Geijsel, F., Hove, A., De laet, M., & Nieuwenhuis, L. (2006). Communities of practice as stimulating forces for collective learning. *Journal of Workplace Learning*, 18(5), 29.
- Moller, K., & Svahn, S. (2004). Crossing East-West boundaries: Knowledge sharing in intercultural business networks. *Industrial Marketing Management*, 33, 219-228.
- Monge, P. R. & Contractor, N. S. (2001). Emergence of communication networks. In Jablin, F. M. & Putnam, L. L. (Eds.), *The New Handbook of Organizational Communication Advances in Theory, Research, and Methods*. Thousand Oaks, CA.: Sage Publications Inc.
- Monge, P. R. & Contractor, N. S. (2003). *Theories of Communication Networks*. Oxford University Press.

- Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *The Academy of Management Review*, 23(2), 242–266.
- Neumann, M., O'Murchu, I., Breslin, J., Decker, S., Hogan, D., & MacDonaill, C. (2005). Semantic social network portal for collaborative online communities. *Journal of European Industrial Training*, 29(6), 472-487.
- Nonaka I., & Konno, N. (1998). The Concept of 'Ba': Building a Foundation for Knowledge Creation. *California Management Review*, 40(3), 40-54.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5, 14-37.
- Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York: Oxford University Press.
- Nonaka, I., & Toyama, R. (2003). The knowledge-creating theory revisited: knowledge creation as a synthesizing process. *Knowledge Management Research & Practice*, 1(1), 2-10.
- Nonaka, I., & Toyama, R. (2007). Why do firms differ? The theory of the knowledge-creating firm. In K. Ichijo & I. Nonaka (Eds.), *Knowledge creation and management: New challenges for managers* (pp. 13-31). New York, NY: Oxford University Press.
- O'Mahoney, S. & Ferraro, F. (2007). The emergence of governance in an open source community. *Academy of Management Journal*, 50(5), 1079–1106.
- Oldenkamp, J. H. (2001). Limitations of managing knowledge sharing. In: D. Remenyi (Ed.), *Proceedings of the Second European Conference on Knowledge Management*, Bled, Slovenia, 411-418.
- Organ, D.W. (1988). *Organizational Citizenship Behavior: The Good Soldier Syndrome*. Lexington Books, Lexington, MA.
- Osterloh, M., & Frey, B. S. (2000). Motivation, knowledge transfer, and organizational firms. *Organization Science*, 11, 538-550.
- Palloff, R., M. & Pratt, K. (2005). *Collaborating online: learning together in community*. San Francisco: CA. Jossey-Bass Publishers.
- Pan, S. L., & Leidner, D. E. (2003). Bridging communities of practice with information technology in pursuit of global knowledge sharing. *Journal of Strategic Information Systems*, 12, 71-88.

- Perkins, D., Florin, P., Rich, R., Wandersman, A., & Chavis, D. (1990). Participation and the social and physical environment of residential blocks: Crime and community context. *American Journal of Community Psychology*, 18, 83–115.
- Pillai, R., & Williams, E., (2004). Transformational leadership, self-efficacy, group cohesiveness, commitment, and performance. *Journal of Organizational Change Management*, 17, 144-159.
- Poell, R. F., & Van der Krogt, F. J. (2003). Learning strategies of workers in the knowledge-creating company. *Human Resource Development International*, 6(3), 387-403.
- Polany, M. (1966). *The Tacit Dimension*. Garden City, N.Y: Doubleday.
- Politis, J. D. (2002). Transformational and transactional leadership enabling (disabling) knowledge acquisition of self-managed teams: the consequences for performance. *Leadership & Organization Development Journal*, 23(4), 186-197.
- Politis, J. D. (2003). The connection between trust and knowledge management: what are its implications for team performance. *Journal of Knowledge Management*, 7(5), 55-66.
- Powers, V. (2004). Virtual communities at Caterpillar foster knowledge sharing. *Training and Development*, 58(6), 40-45.
- Preece, J. (1999). Empathic communities: Balancing emotional and factual communication. *Interacting with Computers*, 12(1), 63–77.
- Preece, J. (2000). *Online Communities: Designing usability, supporting sociability*. Chichester, UK: John Wiley & Sons.
- Preece, J., & Maloney-Krichmar, D. (2005). Online communities: Design, theory, and practice. *Journal of Computer-Mediated Communication*, 10(4), 124-145.
- Price, S. M. (2006). *Is organizational knowledge manageable? Examining the knowledge management construct*. Paper presented at the 2006 Academy of Human Resource Development conference, Columbus, Ohio.
- Reid, F. (2003). Creating a knowledge sharing culture among diverse business units. *Employment Relations Today*, 30(3), 43–49.
- Roberts, J. (2000). From know-how to show-how? Questioning the role of information and communication technologies in knowledge transfer. *Technology Analysis & Strategic Management*, 12(4), 429-433.
- Roschelle, J., & Teasley, S. (1995). The construction of shared knowledge in collaborative problem solving. In C. E. O'Malley (Ed.), *Computer supported collaborative learning* (pp. 69-97). Berlin: Springer-Verlag.

- Rowley, J. (2001). Knowledge management in pursuit of learning: the learning with knowledge cycle. *Journal of Information Science*, 27(4), 227-237.
- Ryu, S. Ho, S. H. & Han, I. (2003). Knowledge Sharing Behavior of Physicians in Hospitals. *Expert Systems with Applications*, 25, 113-122.
- Sabherwal, R., & Becerra-Fernandez, I. (2003). An empirical study of the effect of knowledge management processes at individual, group, and organizational levels. *Decision Sciences*, 34(2), 225-237.
- Sarker, S., Sarker, S., & Nicholson, D., Joshi, K. D. (2005). Knowledge Transfer in Virtual Systems Development Teams: An Exploratory Study of Four Key Enablers. *IEEE Transactions on Professional Communication*, 48(2), 201-218.
- Schaubroeck, S., Lam, S. K., & Cha, S. E. (2007). Embracing Transformational Leadership: Team Values and the Impact of Leader Behavior on Team Performance. *Journal of Applied Psychology*, 92(4), 1020–1030.
- Schlanger, M., Fusco, J., & Schank, P. (2002). Evolution of an online education community of practice. In K. A. Renninger & W. Shumar (Eds.), *Building virtual communities: Learning and change in cyberspace* (pp. 129-158). London: Cambridge University Press.
- Schriesheim, C.A., Castro, S.L., Williams, E.A., Medsker, G.J., & DeChurch, L.A. (2000). Three studies of the validity and reliability of the transformational leadership inventory (TLI). Unpublished working paper, School of Business Administration, University of Miami.
- Schultze, U., & Boland, R. J. (2000). Knowledge management technology and the reproduction of knowledge work practices. *Journal of Strategic Information Systems*, 9(2), 193-212.
- Schutz, A. (1967). *The phenomenology of the social world*. Northwestern University Press, Evanston, IL.
- Schwen, T. M., & Hara, N. (2003). Community of Practice: A Metaphor for Online Design? *The Information Society*, 19, 257-270.
- Sharratt, M., & Usoro, A. (2003). Understanding Knowledge-Sharing in Online Communities of Practice. *Electronic Journal of Knowledge Management*, 1(2), 187-196.
- Sloman, M., & Reynolds, J. (2003). Developing the e-learning community. *Human Resource Development International*, 6(2), 259-272.
- Smith, A. D., & Rupp, W. T. (2004). Knowledge workers' perceptions of performance ratings. *Journal of Workplace Learning*, 16(3), 146-166.

- Smith, P. J. (2003). Workplace learning and flexible delivery. *Review of Educational Research*, 73(1), 53-88.
- Song, S. (2002). An Internet knowledge sharing systems. *Journal of Computer Information Systems*, 42(3), 25–30.
- Sosik, J. J. (1997). Effects of transformational leadership and anonymity on idea generation in computer-mediated groups. *Group & Organization Management*, 22, 460-479.
- Squire, K., & Johnson, C. (2000). Supporting distributed communities of practice with interactive television. *Educational Technology Research and Development*, 48 (1), 23–43.
- Swan, J., Scarbrough, H. and Robertson, M. (2002) The construction of communities of practice in the management of innovation. *Management Learning*, 33(4), 477–496.
- Szulanski, G.. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational Behavior Human Decision Processes*, 82(1), 9-27.
- Szulanski, G., Cappetta, R., & Jensen, R. J. (2004). When and how trustworthiness matters: Knowledge transfer and the moderating effect of causal ambiguity. *Organization Science*, 15(5), 600-613.
- Teo, H., Chan, H., Wei, K., & Zhang, Z. (2003). Evaluating information accessibility and community adaptivity features for sustaining virtual learning communities. *International Journal of Human-Computer Studies*, 59(5), 671-697.
- Tepper, B. J., & Percy, P. M. (1994). Structural validity of the multifactor leadership questionnaire. *Educational and Psychological Measurement*, 54, 734–744.
- Tsai, M. & Tsai, L. (2005). An empirical student of the knowledge transfer methods used by clinical instructors. *International Journal of Management*, 22(2), 273-84.
- Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionist approach. *Strategic Management Journal*, 17, 11-25.
- Van den Hooff, B., & De Ridder, J. A. (2004). Knowledge sharing in context: the influence of organizational commitment, communication climate and CMC use on knowledge sharing. *Journal of Knowledge Management*, 8(6), 117–130.
- Van Winkelen, C., & Ramsell, P. (2003). Why aligning value is key to designing communities. *KM Review*, 5(6), 12-18.
- Venkatesh, V., Morris, M.G., Davis, G. B., Davis, F.D. (2003). User acceptance of information technology: toward a unified view. *MIS Quarterly*, 27(3), 425–478.

- Vestal, W. (2006). CoPs in progress: AQPC and Texas Medical Association. *KM Review*, 9(1), 8-9.
- Vestal, W. (2006). Sustaining Communities of Practice. *KM World*, 15(3), 8-11.
- Voelpel, S. C., & Han, Z. (2005). Managing knowledge sharing in China: the case of Siemens ShareNet. *Journal of Knowledge Management*, 9(3), 51-63.
- Von Krogh, G. (2002). The communal resource and information systems. *Journal of Strategic Information Systems*, 11(2), 85-107.
- Von Krogh, G., Spaeth, S., & Lakhani, K. R. (2003). Community, joining, and specialization in open source software innovation: a case study. *Research Policy*, 32(2), 1217-1241.
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Walumbwa, F.O., Lawler, J.J., Avolio, B.J., Wang, P., & Shi, K. (2005). Transformational leadership and work-related attitudes: the moderating effects of collective and self-efficacy across cultures. *Journal of Leadership and Organizational Studies*, 11(3).
- Wang, H., Chou H., & Jiang, J. (2005). The impacts of charismatic leadership style on team cohesiveness and overall performance during ERP implementation. *International Journal of Project Management*, 23(3). 173-180.
- Warf, B. (1994). Structuration theory and electronic communications. Wilson, D., Huff, J. (Eds.), *Marginalized Places and Populations: A Structurationalist Agenda*. Praeger, Westport (pp. 43-57).
- Wasko, M. & Faraj, S. (2000). It is what one does: why people participate and help others in electronic communities of practice. *Journal of Strategic Information Systems*, 9, 155-173.
- Wasko, M. & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29(1), 35-58.
- Weiss, L. (1999). Collection and Connection: The Anatomy of Knowledge Sharing in Professional Service Firms. *Organizational Development Journal*, 17(4), 61-77.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge, UK: Cambridge University Press.
- Wenger, E. (2002). *Cultivating communities of practice*. Boston, MA: Harvard University Press.

- Wenger, E. (2004). Knowledge management as a doughnut: Shaping your knowledge strategy through communities of practice. *Ivey Business Journal*, January/February, 1-8.
- Wenger, E. C., & Snyder, W. M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review*, 78(1), 139-145.
- Wenger, E., McDermott, R., & Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge*. Boston, MA: Harvard Business School Press.
- Wick, C. (2000). Knowledge management and leadership opportunities for technical communicators. *Technical Communication*, 47(4), 515-529.
- Williams, R., & Cothrel, J. (2000). Four smart ways to run online communities. *Sloan Management Review*, 41(4), 81-91.
- Wittenbaum, G. M., Hollingshead, A. B. & Botero, I. C. (2004). From cooperative to motivated information sharing in groups: Moving beyond the hidden profile paradigm. *Communication Monographs*, 71(3), 286-310.
- Yamazaki, Y., & Kayes, D. C. (2004). An experiential approach to cross-cultural learning: A review and integration of success factors in expatriate adaptation. *Academy of Management Learning Education*, 3(4), 354-379.
- Yang, B. (2005). Factor analysis methods. In R. A. Swanson & E. F. Holton III (Eds.), *Research in organizations: Foundations and methods of inquiry* (pp. 181-199). CA: Berrett-Koehler Publishers.
- Yukl, G. (1998). *Leadership in organizations* (4th Ed.). Englewood Cliffs, NJ: Prentice Hall.
- Zakaria, N., Amelinckx, A., & Wilemon, D. (2004). Working together apart? Building a knowledge-sharing culture for global teams. *Creativity and Innovation Management*, 13(1), 15-29.
- Zhang, Y., & Hiltz, S. R. (2003). Factors that influence online relationship development in a knowledge sharing community, *Proceedings of the Ninth American Conference on Information Systems*, 410-417.
- Zhu, Z. (2004). Knowledge management: towards a universal concept or cross-cultural context? *Knowledge Management Research & Practice*, 2, 67-79.

Appendix A
Consent Letters

Online Consent Letter for Participants

Dear Participants:

It is our great privilege to inform you that you are cordially invited to participate in a research project on communities of practice (CoPs). This research project is being conducted by Professor Scott Johnson and EunJee Kim, Ph.D. candidate from the Department of Human Resource Education at the University of Illinois at Urbana-Champaign.

This study intends to investigate how CoPs members' perceptions are related to knowledge sharing behaviors and the outcomes of the study will help us better understand the drivers of knowledge sharing in order to enhance knowledge sharing and learning in your communities.

We anticipate that this survey will take approximately 8-10 minutes of your time to complete. All data collected during the study will be kept confidential and will remain anonymous.

If you decide to take part in this research, you will be asked to complete the survey. The website hosting the survey is password-protected and it will ask you to enter a password given to you. Please enter the access code in order to begin the survey. Click HERE < <http://www.questionpro.com/akira/TakeSurvey?id=1013463>> to begin the survey!

Please read the following information and ask any questions you may have before agreeing to participate in this study. If you have any questions about this research project, please feel free to contact us at ekim15@uiuc.edu or 1-217-333-5982 (U.S).

We would truly appreciate your time and consideration in participating in this study!

Cordially,

Scott Johnson
EunJee Kim
University of Illinois at Urbana-Champaign

Summary of Research

Purpose of the Study

This study intends to explore the relationships between personal cognitive factors (self-efficacy, outcome expectations), community-related factors (sense of community, leadership of a community), and knowledge sharing behaviors in communities of practice.

Benefits

This study is expected to contribute to expanding and fortifying the existing knowledge base regarding knowledge sharing in online communities of practice. In addition, your feedback will assist your organization in future decisions and direction regarding communities.

Confidentiality

Your survey responses will be strictly confidential and accessible only to the researcher. Your employer will not have any access to your information. The information that is obtained during this research will be anonymously reported and used in aggregated summaries only for research purpose. Your participation in this project is completely voluntary, and you are free to withdraw at any time. The website hosting the survey is secure. No individual identification, such as e-mail addresses or IP addresses, will be stored.

Contact and Questions

If you have any questions about this research project, please feel free to contact the primary researcher, EunJee Kim at ekim15@uiuc.edu or 1-217-333-5982 (U.S). If you have any questions about your rights as a research participant, please contact Bureau of Educational Research at the University of Illinois Institutional Review Board, at 1-217-333-3023 (U.S).

If you agree to participate, please just print a copy of this consent form for your records and proceed to the questionnaire by clicking on the **CONTINUE** button below.
Thank you!

Reminder Email

Dear Participants,

Greetings!

Two weeks ago, you were invited to participate in a research study focusing on communities of practice (CoPs), conducted by the University of Illinois in partnership with your organization.

It is an opportunity for a select group of employees to participate in a study which explores knowledge sharing activities in your CoPs and this message is to remind you of participating in the survey. If you have not had an opportunity to complete the survey, we will greatly appreciate your participation at this time. If you already participated in the study, please disregard this message. We are truly grateful for your help.

This study will provide important information that will help us build a picture of how effective CoPs are in serving their membership and sharing knowledge, and your feedback will assist your organization in future decisions and direction regarding CoPs. Could you please take a few minutes in completing the survey so we have a valid data set? Based on the responses collected, the average time took in completing the survey was 7.6 minutes only.

To participate in the study, please go to:

<http://www.questionpro.com/akira/TakeSurvey?id=1013463>

Again, we sincerely solicit help from you and look forward to your contribution to this important and timely study.

Please feel free to contact the researchers if you have any questions at ekim15@uiuc.edu or 1-217-333-5982 (U.S).

Sincerely,

Scott Johnson
EunJee Kim
University of Illinois at Urbana-Champaign

Appendix B

Online Knowledge Sharing Survey

Online Knowledge Sharing Survey

Please base your answers on your experience with your CoP in the K-Network. If you're involved in several communities currently, then please *choose one community you are most interested in and answer the questions*. Thank you for your participation!

PART I: Items	Answer range
<p>Self-Efficacy for Knowledge Sharing: Please indicate your level of agreement with each statement below that best reflects what you think about sharing knowledge in the community, on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree).</p>	<p>Strongly Disagree (1) – Strongly Agree (5)</p>
<ol style="list-style-type: none"> 1. I am confident in responding or adding comments to messages or articles posted by others. 2. The knowledge I share with my community members should be very useful to them. 3. My limited knowledge, even if shared, will generate little effect within the community. 4. I am confident in giving advice or providing examples to questions or inquiries from others in this community. 5. When I share my knowledge, I am confident in my ability to articulate my knowledge in written, verbal or symbolic forms. 6. I am confident that my knowledge sharing would help the community to achieve its goals. 7. Most other members can provide more valuable knowledge than I can. 8. I am confident in providing my experience, insights or expertise to others by engaging in dialogue with others in the community. 	
<p>Outcome Expectation: This section asks you about your expected outcomes from community activities. Please indicate your level of expectations, on a scale from 1 (No impact) to 5 (Great deal).</p>	<p>No impact (1) – Great Deal (5)</p>
<ol style="list-style-type: none"> 9. If I utilize the shared knowledge from this community, it will help me to increase my effectiveness on my job. 10. My knowledge sharing will strengthen the tie between other members and me in this community. 11. Sharing my knowledge can enhance my reputation in my community. 12. Gaining useful information from the community will help me to spend less time on routine job tasks. 13. Sharing my knowledge will give me a sense of accomplishment. 14. If I share my knowledge with other community members, I will get better cooperation and 	

benefits in return.

15. Sharing my knowledge will help me meet other people with similar interests as mine in this community.
16. If I use knowledge from this community, it will help me to improve the quality of output of my job.
17. Using knowledge from the community will enable me to accomplish my tasks more efficiently.

Sense of Community: This section asks you about your experience with your community. Please indicate your level of agreement with each statement below.

Strongly Disagree (1)
–
Strongly Agree (5)

18. I think my community is a good place for me to expand my knowledge and networking base.
19. My colleagues and I want the same things from the community.
20. I feel as if I belong to my community.
21. I have no influence over what this community is like.
22. It is important for me to participate in this community.
23. People in this community generally don't get along with each other.
24. My postings in this community are often reviewed and commented by other members.
25. I know most of the people who participate in this community.
26. I would like to stay in this community for a long time.
27. If there is a problem in this community members can get it solved.
28. People in this community do not share the same values.
29. Very few of the community members know me.

Knowledge Sharing Behaviors: This section asks you about your knowledge sharing behaviors in the community. Please indicate your level of agreement with each statement below.

Strongly Disagree (1)
–
Strongly Agree (5)

30. I share with my community members my work experience, ideas, and know-how.
31. When I have valuable information related to my community, I make it available to all other members.
32. Members within my community share their work experience and expertise when I ask them about it.
33. I keep my work experience private and rarely share it with others.

- 34. I often ask for advice and information that can help me solve problems in my work.
- 35. I try to stay updated by exploring all the information available in my community.
- 36. I often participate in one or more forums or discussions within my community providing my ideas and helping others find solutions to their problems.
- 37. I never ask other members of this community what they know when I need particular knowledge.

Leadership of a Community

Note: This section asks you about your perception of your leader in the community. Please indicate your level of agreement with each statement below, on a scale from 1 (Not at all) to 5 (Frequently, if not always).

Not at all (1)-
Frequently, if not
always (5)

My Community Leader.....

- 38. Fosters collaboration within the community.
- 39. Shows respect for my personal feelings.
- 40. Asks questions that prompt me to think.
- 41. Develops a team attitude and spirit among community members.
- 42. Challenges me to think about old problems in new ways.
- 43. Treats me without considering my personal feelings.
- 44. Gets the community to work together for the same goal.
- 45. Has ideas that have challenged me to reexamine some of basic assumptions about my work.
- 46. Behaves in a manner thoughtful of my personal needs.
- 47. Encourages community members to be “team players.”
- 48. Has stimulated me to rethink the way I do things.
- 49. Acts without considering my feelings.

PART II

The remainder of the questionnaire asks for some information about you. This information is important to allow us to study the effects of differences between people on their perceptions about their communities. Thank you!

1. What is your gender?

- ① Female
- ② Male

2. What is your age?

- ① 20-30
- ② 31-40
- ③ 41-50
- ④ 51-60
- ⑤ Over 61

3. What is the highest level of education that you have completed?

- ① Completed high school
- ② Associate degrees (Junior college, technical school or community college)
- ③ Bachelors
- ④ Masters
- ⑤ Doctorate

4. Which of the following categories best describes your functional area?

- ① Accounting/ Finance
- ② Engineering, R&D
- ③ Project Management
- ④ Marketing/Sales
- ⑤ IT/Information systems
- ⑥ Human Resource/Training
- ⑦ Product Support
- ⑧ Outsourcing Support
- ⑨ Planning/Operations
- ⑩ Other --Please specify:

5. What is the level of your position?

- ① Senior-level manager

- ② Middle-level manager
- ③ Professional and Technical staff
- ④ Salaried, Supplier employee, and Dealer employee
- ⑤ Other -- Please specify:

6. How long have you been in your current CoP?

- ① Less than 6 months
- ② 7-12 months
- ③ 1-2 years
- ④ 2-3 years
- ⑤ More than 3 years
- ⑥ Others-- Please specify:

7. Please specify the type of your CoP?

- ① 6 Sigma/Quality
- ② Corporate Governance
- ③ Project Management
- ④ Human Resource/Training
- ⑤ Information Technology
- ⑥ Product Systems Development
- ⑦ Product and Service Support
- ⑧ Communications / Customer Services
- ⑨ Strategic Business Planning
- ⑩ Finance/Marketing
- ⑪ Other -- Please specify:

11. What aspects of your CoP help you share knowledge in the community?

Appendix C
Open-Ended Responses

An Open-Ended Question and Responses

Q. What aspects of your CoP help you share knowledge in the community?

The comments from respondents have been sorted below according to the most appropriate dimensions of the major variables of the study. Any additional dimensions emerged from the responses were also listed.

The results of this open-ended responses show that the major variables of the study, self-efficacy, outcome expectation, sense of community, and leadership of a community, and their relationships with knowledge sharing behaviors were well reflected among the communities of practice in the selected company. The results also supplement the findings of the survey by providing any additional comments for community members' engagement in knowledge sharing.

Self-Efficacy for Knowledge Sharing

Example quote: *“Knowing that I have knowledge specific to the community in which I am a member.” “Knowing that the knowledge I contributed is used and it helps others with less experience and knowledge..”*

Performance Outcome Expectation

Example quote: *“The belief that I will enhance my knowledge and skills by participating in this community.” “Updated in my type of job helps keep me in focus with the changing aspects of my job.” “Make others' job easier by helping solve problems..”*

Personal Outcome Expectation

Example quote: *“As I'm not one of those old veterans of this company, I anticipate building some good relationship with other colleagues, maybe professional friendship..?” “When perceived it enhances my knowledge and*

create new knowledge.” “My curiosity about new methodology and lessons learned to improve process and quality.”

Sense of Community

- Membership

Example quote: *“Familiarity with people in the community and feeling that I am part of this group.” “It brings together people who are doing similar jobs and so you can pick the brain of a broad audience.”*

- Fulfillment of Needs

Example quote: *“I find in many cases the problems I met were already discussed by others in the K-Net. This provides very valuable reference.”*

- Influence

Example quote: *“In the communities I belong to, people pay attention to others’ questions... When there is a question on a particular topic, others who have the most knowledge on this topic or who feel they have the most knowledge also respond.”*

- Emotional Connection

Example quote: *“Knowing that like-minded group of people facing the same problem that I have.” Feelings that supported and concerns that shared in similar topics, projects, needs, issues, and challenges..”*

Leadership of a Community

Example quote: *“My community leader’s encouragement to submit ideas and to look for new ways of doing things help me most share my knowledge in this community.” “The regular emails seeding and facilitating discussions, and keeping events and activities for us lead me to think about my knowledge I can share with other people in my community.”*

-Other Themes Emerged

Knowledge Sharing Culture in the Organization

Example quotes: *“My knowledge sharing is based on the company values and culture embedded in.” “Largely, people are willing to share, either they are close*

to retirement, or just starting their career.” “Knowledge that we are a team working toward the best solution for our organization.”

Community Culture

Example quotes: *“Having friendly climate for open communication and collaboration help me ask questions in my community.” “Our healthy environment between new comers and highly experienced.”*

Community Structure & Operation

Example quotes: *“The way community set up its values with members.” “The defined membership for common purpose, clear objectives of a CoP, sense of others’ participation, and continued activity stimulate my continued participation.” “Regular teleconferences” “Restricted membership access”*

Global Communities

Example quote: *“As a global community, I feel responsibility to help others who might have less knowledge.” “Getting global perspective and experience in solving my problem.”*

Source for Unique Knowledge

Example quote: *“I can find knowledge that can’t be gained from other places.”*

Accessibility

Example quote: *“I figure it is the quickest way to get that question out to everybody in the community that has something to do with the community topic.” “Reach out to many people quickly or conveniently.” “Best way access to people across functional & business units, particularly the experts in the organization.”*

Perceived Usefulness of Knowledge Entries

Example quote: *“Viewing all the questions and answers others contributed help us all learn.” “Common and central repository on the similar subject (i.e., FAQs, specifications, etc.).”*

Prosocial Behaviors

Example quote: *“My desire to help others.” “I feel like I have to return what I have received from others.”*

Functional Aspects of the System

- Ease of Navigation

Example quote: *“Easy to use--navigating and searching, user friendly interface.”*
“Ability to access the breadth of communication in the organization.”

- Email Notification

Example quote: *“It keeps me updated and jump into the discussion going whenever I receive email notifications of new entries.” “The ease of posting is nice when I can't find an answer anywhere else, but email per posting with no option to turn it off is not the way to go.”*

- Lessons Learned Function (Best Practice):

Example quote: *“Having best practice helps to avoid potential mistakes and waste times.” “Availability of shared policies and practices certainly helps me complete my work with potential creation of the next level of knowledge.”*