

Exploring Knowledge Sharing Among Members of a Community of Practice

Selena S. Blankenship and Wendy E. A. Ruona
University of Georgia

This paper presents the findings of a qualitative study that explored knowledge sharing among members of a community of practice (CoP) in a large, urban high school. Findings suggest that social relationships, informal channels, community culture, levels of trust, and spatial factors influence knowledge sharing, and that CoPs have the potential to foster an organizational culture that supports knowledge sharing. Implications for future research and practice are presented.

Keywords: Knowledge Management, Knowledge Sharing, Communities of Practice

Managing knowledge in organizations has been a growing topic of interest over the past decade. During this period, the concept of communities of practice (CoP) has gained attention as a way to create, share, and manage knowledge and facilitate learning in both public and private sector organizations (Brown & Duguid, 1991; Lesser & Storck, 2001; Saint-Onge & Wallace, 2003; Wenger, McDermott & Snyder, 2002). However, there is little empirical literature addressing *how* knowledge is shared among individuals in organizations (Ipe, 2003). In particular, we do not fully understand the ways members of CoPs share knowledge, what motivates them to do so, and what factors facilitate or impede knowledge sharing processes. If organizational leaders agree that CoPs hold promise for facilitating and managing organizational knowledge and change, then a deeper understanding of the knowledge sharing processes that occur among members of a community of practice is vital to their efforts.

Research Purpose and Questions

This study aims to gain a better understanding of how a community of practice (a) facilitates learning and (b) shares members' interpretations with each other for the purpose of improving practice. The research was guided by the following questions:

- How do members of a CoP share practice-related knowledge?
- What motivates members of a CoP to share knowledge with colleagues?
- What factors facilitate or impede the sharing of knowledge among members?
- What is the role of a CoP in sharing knowledge?

Theoretical Framework

For this study, we draw from the relevant literature on communities of practice, organizational learning and knowledge sharing. In this section we present the theories and models that inform our study.

Communities of Practice

CoPs have been described and conceptualized over the last decade from two main perspectives: social learning theory and knowledge management (Chindgren & Wiswell, 2006). There are many definitions of communities of practice, but basic notion is that CoPs are groups of people who share a common passion or purpose and who interact with the intent to share knowledge. Wenger, McDermott and Snyder (2002) define 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" (p.4). Wenger's (1998) concept of CoPs is grounded in a social theory of situated learning (Lave & Wenger, 1991), of which social development theory (Vygotsky, 1978) plays a key role. Wenger (1999) states that CoPs combine three elements: joint enterprise, mutuality, and shared repertoire. This concept is a key component to understanding how members interact within the community to continually learn from each other and create their shared repertoire.

Brown and Duguid (1991) build their concept of CoPs from an examination of studies of workplace practices, specifically Orr's studies of service technicians, highlighting how informal groups form to 'get the work done' through generation of solutions to problems. The researchers note three elements present in organizations, within the context of community: *working, learning, and innovation*. In more recent work, Brown and Duguid (2001) further their conceptualization arguing that CoPs are the ideal level of analysis for looking at learning, knowledge and work identity formation, and that strategic coordination, or networking of communities may improve knowledge

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movement within an organization.

Saint-Onge and Wallace (2003) approach CoPs as vehicles for increasing intellectual capital and for improving individual, practice, and organizational performance. The authors also propose that CoPs with a strategic purpose help to create an organization's competitive advantage. According to these authors, "communities of practice may be the most significant, tangible example of knowledge management at work in an organization" (p.50). This particular model is grounded in knowledge management theory and embraces the use of technology as appropriate to support CoPs. They organize CoPs into three types: informal, supported, and structured.

CoPs may take many forms; they may vary in size, life span, location (face-to-face vs. virtual), relationship to the organization, and composition (homogeneous vs. heterogeneous). Additionally they may be located entirely within an organization, or may span across organizational boundaries. They may be organic or they may be intentionally formed by the organization (Wenger et al, 2002; St. Onge & Wallace, 2003). While Wenger et al. (2002) believe in the value of CoPs as a structure for creating and codifying knowledge, they also recognize some of the problems associated with CoPs relating to the hoarding of knowledge, clique formation, limitation of innovation, and exclusiveness with regard to membership.

Organizational Learning

Organizational learning has many definitions, most of which refer to multiple levels of learning that lead to change. Rait (1995) summarizes definitions given by organizational theorists of organizational learning: the identification and correction of errors (Argyris & Schön, 1978); a process that leads to second-order change, which results from critically evaluating assumptions that guide behavior (Rait, 1995); behavioral change through the process of gathering information and making sense of it (Huber, 1991); the generation of new knowledge and insights (Hedberg, 1981); and the use of feedback from significant events in the past to make decisions for the future (Levitt & March, 1988). Nancy Dixon (1999) defines organizational learning as "the intentional use of learning processes at the individual, group and system level to continuously transform the organization in a direction that is increasingly satisfying to its stakeholders" (p.6). Further, organizational learning can be defined as the process of learning at the individual, team, and organizational levels (Leithwood & Louis, 1995), making it a relevant theoretical framework when studying a community of practice. Organizational learning is a process that occurs at all levels of an organization, with the purpose of improving the organization through systemic change.

Knowledge Sharing

Knowledge sharing has been identified by many as a key focal area of knowledge management (Davenport & Prusak, 1998; Dixon, 2000; Fullan, 2002). As such, it becomes an important area of study for organizations. While the knowledge management literature has tended to focus on two dominant approaches of either technology-centered or people-centered (Ardichvilli, 2002; Gourlay, 2001), the conceptual as well as empirical literature on knowledge sharing has been focused on both face-to-face as well as technology mediated environments. Studies related to virtual knowledge sharing have focused on an individual's motivation to participate (Hendricks, 1999; Ardichvilli, Page, and Wentling, 2003) as well as barriers to participation in virtual knowledge sharing communities (Ardichvilli et. al, 2003). Studies focused on knowledge sharing in face-to-face environments have dealt with how other concepts such as trust (Abrams, Cross, Lesser & Levin, 2003) and social capital (Willem & Scarborough, 2006) influence knowledge sharing.

Ipe (2003) provides a conceptual framework for knowledge sharing among individuals in an organization. Through an extensive literature review she identifies three factors that influence knowledge sharing between individuals in an organization: the nature of the knowledge; an individual's motivation to share; and, opportunities to share. These three factors are embedded in the context of the organizational culture, or the subculture in which the individuals operate. De Long and Fahy (2000) assert that organizational culture provides context for interaction, controls the relationships between levels of knowledge, shapes assumptions about which knowledge is important, and defines the processes through which new knowledge is created and disseminated in organizations. This stance further supports the position that knowledge sharing is embedded in the culture of the organization.

Research Design

This study is a qualitative, instrumental case study design (Stake, 2000) in that we are using this specific case to provide insight into a particular issue - in this case, knowledge sharing within a community of practice. This case study provides a rich description of the kinds of knowledge sharing/learning processes that take place within a community of practice in a large, urban high school. The high school and the participants of this study are described in more detail below in keeping with the norms of case study research.

Sample and Data Collection

Participants in this study were teachers in a Freshman Academy (described later in this manuscript). Upon approaching the high school, we did not presume that all teacher groups in this high school would display the characteristics of a CoP. Through observation and conversation we studied multiple career academy groups as well as each departmental group of teachers. We determined that the Freshman Academy teacher group best met the criteria of a community of practice as discussed in previous sections of this paper. Participation in the study was completely voluntary. Eleven members agreed to participate.

The majority of data was collected through semi-structured interviews (Patton, 2002) with members of the identified CoP in order to explore knowledge sharing openly and give the participants the opportunity to express their feeling, opinions and experiences. Seven of the subjects participated in one-on-one interviews which lasted approximately one hour and were digitally recorded. Four of the subjects, coincidentally all first-year Freshman Academy teachers, wished to participate but had various scheduling conflicts. The primary researcher and the four teachers mutually agreed to a focus group interview for those four to allow for maximum participation. The focus group interview lasted approximately one hour.

Additionally, participant observation (Patton, 2002) and document review were used to crystallize and triangulate (Stake, 2000) the data. Participant observation occurred during a whole academy meeting of the Freshman Academy, as well as during one lunch period and two class changes. Participants were observed in both the formal and informal settings, using non-participant observation methods (Patton, 2002). Information gathered during the interview process informed what activities were observed and participants were informed prior to being observed. In addition, participants were asked to voluntarily provide documents for review (meeting minutes, e-mails) and analysis in order to corroborate interview data. When appropriate, consent was obtained from both the sender and the receiver of the document before analysis of the document occurred.

Data Analysis

Qualitative data analysis demands inductive reasoning to search for important meanings and patterns in what the researcher has heard and seen. All interviews were transcribed by the primary author of this research to deepen her level of interaction with the data. Once transcribed, the primary researcher analyzed the data based on the constant comparative method (Maykut & Morehouse, 1994). Data was coded and organized utilizing a rigorous process developed by Ruona (2005). Coding involved a process of constantly moving back and forth between the data, re-categorizing and recoding as the data were compared. The second author of this manuscript served as a “peer/expert” reviewer of the process. Once the final analysis had been conducted, each participant was asked to respond to a member check. Six participants responded and agreed with the themes from the data.

Subjectivity

In qualitative research, it is important to make explicit the researcher’s subjectivity which provides the researcher a way to “escape the thwarting biases that subjectivity engenders, while attaining the singular perspective its special persuasions promise” Peshkin, 1988, p.21). The primary researcher’s experience in K-12 education led her to form a set of assumptions about the way knowledge sharing occurs. She previously taught in the Freshman Academy, and two years ago she served as a consultant to the group as they worked through some very challenging circumstances. The prior relationship that she had established with this group of teachers afforded her access to the group and their daily activities with relative ease.

Context and Participants

A qualitative case study “seeks to describe that unit in depth and detail, holistically and in context” (Patton, 2002, p.55). Furthermore, Hayes (2004) asserts that every case study should provide a rich description of the site, which helps to create a visual image, or context for the reader. In this section we describe both the organizational context for the study as well as give a description of the Freshman Academy and its members.

Organizational Context

Broadsprings City High School (BCHS) (a pseudonym) is a large, urban high school located in a university town in the southern United States. The school has a population of approximately 1500 students and a faculty and staff of over 100. BCHS serves a diverse student population with regard to race, ethnicity, socioeconomic status, and ability level. The faculty, though not as racially diverse as the student body, comes to the education profession from a variety of backgrounds and levels of teaching experience. The leadership of the school is well-established; the current principal has held the position for seven years, and two of the three assistant principals have been at the school in leadership positions for at least five years each. The school has recently undertaken a major change initiative which involves extending the smaller learning community concept of their established Freshman Academy to other grades through the creation of five Career Academies. Teachers were given the opportunity to select the

career academy with which they preferred to be affiliated, and over the next two years, students in grades 10-12 will feed into the career academies through a self-selection process.

The Case

The Freshman Academy at BCHS has been in existence for the past seven years as a research-based intervention to help more students successfully transition to high school, perform better, and graduate on time. During the early years of implementation, the teaching staff consisted of three teachers from each of the core academic areas – math, science, language arts, and social studies, plus one special education teacher. Those who are still employed at the school who were involved in the initial implementation recall the first years of the Freshman Academy being consistent with the first years of any organizational change project; the group struggled at times, made some progress, and continually adjusted and re-adjusted to address new issues and challenges as they arose. For the first five and a half years, all of the teachers' classrooms were not physically located near each other; some were clustered together, but the entire faculty was housed by teaching department. This resulted in Freshman Academy teachers only seeing those outside their teaching discipline during their weekly team meetings, or during their monthly whole-academy meeting. Consequently, there was far less interaction between the teachers on the Freshman Academy and it seemed as if they spent more time “complaining about problems” than strategizing to solve them (“Anna,” interview on April 9, 2007). The group reached a crisis point during the fourth year of existence, almost reaching the point of making a decision about whether or not to continue with the Freshman Academy. However, the group, assisted by the primary researcher working as a consultant, strategized ways in which the program and the working relationship of the teachers could improve. The major changes that resulted were physically locating all Freshman Academy teachers together in one part of the building; providing common planning time for the whole academy, not just teaching teams; restructuring their annual planning retreat; and developing a common classroom management plan called “The Academy Way.”

Currently the teaching staff of the Freshman Academy consists of fourteen teachers: three teaching teams of four individuals each, one special education teacher and one teacher who specializes in instruction of English Language Learners. Freshman Academy teachers range in age from early twenties to mid-forties, and encompass both novice and veteran teachers. Ten of the fourteen teachers are female, and there is one Hispanic teacher among the otherwise all Caucasian group. A few of the teachers on the Freshman Academy have spent their entire tenure at BCHS teaching as a part of this group. Two of the teachers, Anna and Abby have been involved with the Freshman Academy since almost the very beginning. The leadership for the group is shared by the three team leaders: Anna, Clarissa, and Jane. The take turns leading the once monthly whole-academy meetings, as well as lead their individual weekly team meetings. The group is physically housed together, which means that they also share the same lunch period. This year, in addition to their own meetings, some of the Freshman Academy members have been offering support to the Career Academy teacher groups.

Results and Findings

The data collected from the interviews and observations were analyzed and broad themes emerged. The preliminary findings of the study are presented below, organized according to research question.

R1. How do Members of a CoP Share Practice-Related Knowledge?

Participants revealed that they have ample opportunity to share knowledge with each other during their formal meeting times, both in their team meetings as well as in their whole-academy meetings. When asked, ‘in what ways do the teachers in the Freshman Academy work together, or support each other,’ teachers shared detailed examples of how, through both formal and informal channels, they share knowledge, strategize, and develop innovative solutions to work-related issues:

We've had it come up several times where somebody had to call [a student's] parents and they say, “Do you need me to tell them anything about what's going on in your class?” And I say ‘well, not really because I'm not really having those problems, but it's because I don't have this person, this person, and this person in that class. So maybe you need to try to remove him from that group of students as much as possible, or maybe, you know they don't... [the student] doesn't like it when you ‘get in their face.’ They're one of those people that you've got to just back off.’ So we do a lot of strategizing about how we can fix some of these problems.

Participants also shared examples of innovative support mechanisms that emerge from discussions during team meetings as seen in this quote from Anna:

One of my classes in particular, a lower level class, was just difficult to manage; difficult to get them to pay attention and to focus. Another teacher that had a student teacher began to come in and be a participant in the class to see what that might do. And it was really interesting to see how students would react to her...once they saw that she was trying to learn, it was interesting how they would kind of follow her lead...Their behavior was

much better...and so they were a lot more focused. And her idea to do that came out of one of our meetings and our discussion about the fact that I was struggling with this class and trying to figure out how to motivate them, how to get them involved...just having her come in and kind of take on that role helped.

Additionally, every participant interviewed described the informal ways that they share with each other. Responses categorized as informal channels for knowledge sharing included those such as “we see each other in the hallways,” “we send e-mails back and forth,” and “we do a lot of checking-in between classes.”

R2. What Motivates Members of a CoP to Share Knowledge With Colleagues?

Participants responded that they were intrinsically motivated to share knowledge with other members. Abby related a story about how she watched both of her parents, who were teachers, work in isolation and how that influenced her desire to work with and share things with others. She stated, “That was just one of my feelings that I didn't want to feel as alone in my job as they sometimes seem to be.” When asked the same question about why they share knowledge with colleagues, the group of new teachers stated that it's “because we need help!” John elaborated by saying, “we need help, we recognize that we all need help, you know, even the veterans need help” and Rebecca chimed in adding, “and it makes us better at what we do.” Participants in other interviews stated, “It's come from a sense that I have stuff to share;” “I'm also getting a lot back;” and “why not help out?”

Community culture also emerged as reasons why members share knowledge with each other. Adam shared this: We realize we need each other; we can't afford to be prideful and say well, ‘screw them, I'm going to do this my own way, or I'm not going to interact.’ We realize how important it is...when Louis first got here he had questions...you know he jumped right into the middle of a working machine and he needed us to help him and we just did.

R3. What Factors Facilitate or Impede the Sharing of Knowledge Among Members?

Social relationships were mentioned extensively throughout all the interviews and were believed by participants to be a factor that facilitated knowledge sharing. Some of the responses categorized as relating to social relationships included “we are comfortable talking to one another;” “I've got people all around me I can talk to, laugh with and share professional ideas with;” and, “when we don't eat together...I do miss them.” One teacher summed up how their time spent together during lunch develops relationships among the group:

It's helpful...it benefits [our group] a lot I think, because somebody said the other day in an interview ‘those ninth grade academy teachers are really close’ and I think people outside of us see that and it helps us develop those relationships where I enjoy coming to work. I like to talk to my colleagues...it has taken some time to develop that...it helps you to feel a little more connected and not so isolated.

Data from the participant observation confirmed the participants' statements that social relationships contribute to the knowledge sharing process. During the entire observation, there was evidence of strong social relationships among members of the group. When teachers entered the room, they did not simply take a seat and wait quietly for the meeting to begin. They initiated conversations with each other about things of a personal nature. During the meeting, they playfully teased one another, erupting into laughter on several occasions.

Participants shared that things like physical location, having time together and technology influenced their knowledge sharing. Some of their responses were, “I think it helped a lot when they moved them all on the same hall,” “our common planning is huge,” and “e-mail is always two seconds away.” Abby related how being located near each other facilitates knowledge sharing, saying

every single morning either myself or the English teacher kind of look at each other and determine who's going to cross the hallway and I go stand at his door or he comes and stands at my door and it's just, it's good because those are the kind of conversations that really help my teaching.

Being accessible to one another, whether it is physically, virtually, or during a common planning time increases the likelihood that knowledge sharing will occur.

Another finding that emerged from the interviews and was noted during the observation is that while knowledge sharing and creation occurs during them, the formal meetings tend to be more administrative and transactional in nature. The overwhelming majority of the meeting that was observed was spent on transactional items, dividing up responsibilities for upcoming activities, updating survey items, etc. Teachers in interviews shared that most of the knowledge sharing occurs outside these formal work spaces.

Community culture and trust were cited by participants as factors that make it easy to share knowledge with other. When discussing how community norms facilitate knowledge sharing, Rebecca shared the following:

...ground rules really; you know, starting with the retreat, having an idea about how to approach things with each other and learning each other; knowing what different people can handle or not handle, and being respectful of that, and I think it makes you a lot more comfortable.

Most participants explicitly stated that trust makes it easy to share knowledge with each other. While they all mentioned that high levels of trust had not always been present in the past, few could articulate what had

precipitated the increase levels now present. Others proposed that “being near each other” and the leadership style of the academy leaders nurtured the development of the current levels of trust among members.

R4. What is the Role of a CoP in Sharing Knowledge?

An interesting observation from field notes during the participant observation is the number of times the more expert members in the meeting provided unsolicited explanations or clarifications to the newer members. It was obvious that the experienced members wanted the new members to have a clear understanding of the reasons behind the actions they planned to take or the decisions they had made. Louis, a new teacher, took the initiative to make a suggestion about a survey item, “Is there anything on there about I think my grades are important?” which demonstrated his perception that his opinion is valued or that he feels he has something to contribute.

In interviews one teacher shared how she tries to make herself available to a new teacher to offer him help:

...I can say to him as many times as I want ‘E-mail me over anything or call me anytime you need anything.’ But he, like any of us I think feels like he’s constantly harassing me. Whereas I feel, it’s your first semester, you know, harass me, that’s what I’m here for ... because I remember what it was like to be in my first semester. It was miserable, and so anyway, I think that it’s made him more comfortable with me and I think it’s also made him more comfortable with John so that he can go to either of us...and he was able to share some things so that maybe it wasn’t like, you know, I’m just mooching off of you guys and not giving you anything back.

Findings related to participant responses about levels of trust, sense of community, and embedding of knowledge directly relate to this research question. When sharing about what he feels makes them a CoP, Don stated “...we all do have that main goal; that our kids will be successful and we trust that in each other.” Abby referred to sharing knowledge in the community and how important that will be as the group gains three new leaders next year. She shared, “This has been a process...and whether or not we move people in and out we still know what we are doing as an Academy.”

Discussion

Five broad themes emerged from the data collected across the eight interviews and the participant observations: (1) spatial factors influencing opportunity for knowledge sharing; (2) the importance of social relationships to the sharing of knowledge; (3) motivation to share knowledge; (4) channels for knowledge sharing; and (5) support for new members in sharing knowledge. Some of the themes that emerged from the data were similar to elements of Ipe’s (2003) conceptual framework for knowledge sharing. When we began this research project we expected to find based on our literature review that organizational culture and the level of trust among individuals have an effect on the way knowledge is shared. These elements were particularly evident in motivation to share, the factors that facilitate knowledge sharing and in the role of the CoP in sharing knowledge.

Spatial Factors Influencing Opportunity

As we shared in the literature review, Ipe (2003) identified ‘opportunities to share’ as a significant factor influencing knowledge sharing. Her work specifically focused on the purposive and relational learning channels available to individuals. Spatial factors such as the proximity they have with one another physically, virtually, and temporally also facilitate knowledge sharing through increased opportunity to share. According to the members interviewed, their opportunities to share knowledge dramatically increased once they were housed together and were given common planning time.

Importance of Social Relationships

The evidence from the data supports the notion that the social relationships developed within this community of practice are significant to the enhancement of the sense of community that members feel. Building social relationships also builds trust, which is critical for knowledge sharing (Abrams et al., 2003). This evidence on the importance of social relationships supports the idea that the role of the CoP in sharing knowledge is to foster an environment of support and trust that enables knowledge sharing to occur.

Motivation

Teachers in the freshman academy are motivated to share knowledge because of two factors: intrinsic motivation and community culture and norms. Many participants cited the intrinsic need to share with each other. Some of the motivation comes from a sense they feel they have something to contribute, and that they are also benefiting from the experience, which is referred to as reciprocity, one of Ipe’s (2003) internal factors of motivation to share knowledge. The other reason that members share with one another is their sense of community. They have a sense of responsibility to share with their colleagues that stems from their belief that they all need each other’s support and expertise, both novice and expert alike.

Channels for Knowledge Sharing

The organizational structure of the Freshman Academy provides channels for knowledge sharing that are more formal in nature. The division of the whole academy into teams which meet on a regular basis provides the opportunity for knowledge sharing to take place through this formal channel. The data point toward members of a CoP sharing knowledge through a variety of means which are both formal and informal. While there is opportunity for knowledge sharing and creation within the formal channels, much of what happens in formal meetings is administrative and transactional in nature. This observation makes us wonder if providing a designated time to address the transactional, administrative items on a monthly basis as a whole group is a factor that facilitates the knowledge sharing that occurs informally at other times. If members are not spending all of their free time focusing on the transactional, then they might possibly have more time to engage in knowledge sharing in informal settings.

Support for New Members

Many of the participants spoke extensively about the way in which veteran Freshman Academy teachers share knowledge with novice members as a vehicle of support as well as to build the novice's level of expertise. The notion of support for new members of the community of practice is one that is supported by and extends Lave and Wenger's (1991) concept of legitimate peripheral participation in a community of practice. The level of support which was offered to novice members, as evidenced through the interviews with the new teachers, appears to be more intensive than the level of support one would expect to find in a formal mentoring program. These data suggest that one of the roles of the CoP in sharing knowledge is to build the expertise of the novice members.

Implications for Research and Practice

This study contributes to new understanding about the way in which CoPs, and specifically teachers in this CoP, work together and share knowledge, and what factors facilitate or impede the sharing of professional knowledge. In the specific context of this case, it is clear that administrators and HRD professionals working with schools could utilize the insights gained in this study to improve the communication processes in their schools, thereby potentially enhancing the organizational learning and change that takes place. Further, by attempting to understand knowledge sharing processes of members of a CoP this study adds to the growing knowledge base around CoPs more generally (outside of the school context) and their potential as a vehicle for managing knowledge and enhancing organizational learning and change.

The findings would lead us to believe that community culture and levels of trust affect the way knowledge is shared. This is an area that warrants further study, particularly on the ways in which 'sense of community' shapes knowledge sharing in a CoP. These findings also have implications for leaders of organizations who are considering CoPs as a component of their knowledge management strategy, as they may find that a culture supportive of learning coupled with high levels of interpersonal trust will greatly enhance the knowledge sharing that takes place.

What else do the experienced teachers in the community do to facilitate the growth and development of the new members of the community? How does the support of new members impact the trust and commitment that is built and how does it facilitate or inhibit the novice individual's ability or willingness to share knowledge? These areas relating to how novice members enter the community and develop expertise are ripe for future research, and may also have implications for studies relating to mentoring, employee retention and organizational commitment.

Recently there has been dialogue on the ways in which HRD professionals can use their expertise to facilitate knowledge management processes within an organization (Ardichvilli, 2002; Gourlay, 2001). Through an increased understanding of the way CoP members share knowledge, HRD professionals can focus their efforts using their expertise related to organization design, team and group dynamics, facilitation, individual and team learning, and organizational culture to facilitate the knowledge sharing processes within and among CoPs across the organization.

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