

## ONLINE KNOWLEDGE SHARING

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### ABSTRACT

The concept of **knowledge sharing** finds historical support in theories on the acquisition and creation of knowledge. While the key to **knowledge sharing** depends on frequent and regular **social interaction**, the recent rapid development of the Internet has enhanced much of the **social interaction** taking place among individuals at any time, at any place, and with any person. Through a review of the literature, this chapter defines online **knowledge sharing**, discusses the effects of intrinsic and extrinsic motivational factors in explaining online knowledge behavior, explores the various forms of **knowledge sharing** in different online learning environments, and reviews the measurement of online **knowledge sharing**. The chapter also discusses online knowledge-sharing issues that should be addressed in future.

### INTRODUCTION

Online **knowledge sharing** refers to the *online communication of knowledge so that*

*knowledge is learned and applied by an individual.* Several key aspects of the term can be identified. First, it concerns interactions among individuals who communicate with one another. Second, the use of the term “online” signifies a focus on **social interaction** through online connections and/or online environments. Third, it involves the exchange of knowledge. Individuals come to understand the knowledge they acquire through the process of online communication and **social interaction**. More importantly, individuals are able to apply such knowledge in future in a similar or different context. Online communication among individuals thus enables **knowledge sharing** to take place in an online learning environment such that the learner understands the knowledge acquired and is able to apply it in similar or other contexts. Such a definition distinguishes the *online* context from traditional means of communication and differentiates **knowledge sharing** from purely emotional support.

## **THE INTELLECTUAL HISTORY**

**Knowledge sharing** represents a critical step in the knowledge-creation process from a variety of knowledge perspectives. Individuals create knowledge and become knowledgeable or develop expertise. The key to learning is to locate knowledgeable others and to learn from them. However, some knowledge cannot be explicitly described and transferred without a certain kind of interaction between experts and learners. In addition, knowledge may not exist in knowledgeable others or experts, but may be sticky knowledge

embedded in communities of practice. Knowledge can be shared only through **social interaction** among individuals who truly understand the practice within a specific context.

Furthermore, the social dimension of knowledge has evolved as an integral part of the process of knowledge creation and knowledge acquisition. Various knowledge perspectives emphasize that knowledge is imparted through continuous transactions between individuals, with **social interaction** at the forefront of such transactions. For example, Schraw (2006, p. 246) argued that learners actively construct meaning rather than simply assimilating it in a passive manner. The social dimension of learning therefore plays a central role in the construction of knowledge. Schraw suggested that most contemporary educators support such a constructivist view in one way or another. Prawat (1996) suggested that individual-**social interaction** underlies the knowledge-construction process and rejects the notion that the locus of knowledge is in the individual (p.217). Rather, knowledge is the product of a perfect inferential system between the individual and the social environment. The post-positivist perspective on knowledge states that **knowledge sharing** is a process of consensual understanding situated in everyday experience, and holds that knowledge is negotiated among those who encounter and use it.

## **THE CURRENT STATUS OF THE KNOWLEDGE LITERATURE**

### **Nature of individual **knowledge sharing** and learning**

A popular socio-cultural theory of learning is that of Lev Semyonovich Vygotsky, who explained the mechanism by which knowledge is acquired and represented through knowledge sharing and social interaction (Vygotsky, 1978). This mechanism comprises two planes: the social/individual plane and the public/private plane. Learning starts on the social plane, with learners acquiring new concepts and strategies through interactions with more knowledgeable others. Individual learners then use and extend the concepts and strategies thus acquired to other contexts, and meanings and interpretations are initiated through social interactions (social to individual). Learning then emerges in the public domain, with the knowledge being used by more knowledgeable others and made available to learners. Through interactions within the public domain, individual learners understand, adjust, and implement the knowledge they have learned in the private domain (public to private). Harre (1984) and Wertsch and Bivens (1992) concluded that the success of learning is based on the assumptions that knowledgeable members of a culture will assist others to learn and that learners will actively engage in learning activities to facilitate higher mental functions. Social interactions are initiated among individual learners and naturally result in knowledge sharing.

## Organizational learning and knowledge sharing

Ikujiro Nonaka put forward a dynamic theory of organizational knowledge creation that posits social interaction among individuals as the only means by which tacit-to-tacit and tacit-to-explicit knowledge sharing can take place. At the fundamental level, knowledge is created by individuals (Nonaka, 1994, p. 17). From an organizational point of view, organizations cannot create knowledge without individuals. Organizations provide a context designed to encourage individuals to create knowledge. Through social interaction in informal communities, organizations amplify the knowledge created by individuals, transform such knowledge, and legitimize it through formal notions of a hierarchical structure. Specifically, Nonaka suggested that knowledge appears in two forms: tacit and explicit. Based on these two forms of knowledge, knowledge is created through four modes of knowledge conversion: from tacit to tacit (socialization), explicit to explicit (combination), tacit to explicit (externalization), and explicit to tacit (internalization). Social interaction appears to be the key conversion process by which tacit and explicit knowledge is created. For example, an individual can acquire tacit knowledge through their interactions with individuals. By way of observation, imitation and practice, individuals gain shared experience and share one another's thinking processes. The key to gaining tacit knowledge is shared experience through a process known as socialization. Another means of extracting tacit knowledge from explicit knowledge involves the use of social processes that combine explicit knowledge held by

individuals (p.19). Individuals exchange and combine their existing explicit knowledge through meetings and telephone conversations to reconfigure, recategorize, or recontextualize such knowledge, thus leading to the formation of new knowledge. The theory of knowledge creation thus underlines the importance of knowledge sharing and the key role it plays in creating new knowledge.

### **Community of practice and knowledge sharing**

Etienne Wenger (1998) developed the theory of communities of practices to explain knowledge embedded in social practices. According to this *communities of practice theory*, engagement in social practice is the fundamental process by which humans learn. This concept suggests that learning is a process of social participation, a notion further supported by the fact that learner participation is associated with positive effects on learning, satisfaction and retention.

Brown and Duguid (2001) argued that too much attention is often paid to the idea of community and too little to the implications of practice (p.198). They suggested that work practice is critical to understanding the acquisition of knowledge at work. Although it is not greatly connected to the community or to the structure of a formal or informal community, knowledge should be viewed through the lens of practice and the perspective of participation. Knowledge developed through participation will be extended to the social sphere if work practices are social. Knowledge is thus viewed less as

something mandated by structure or dictated by culture and more as something that participation helps to create (p.202).

### **Extrinsic and intrinsic motivation for knowledge sharing**

The willingness to share knowledge is regarded as a prosocial form of behavior, both among individuals in interpersonal relationships and among employees engaging in organizational behavior. While this type of prosocial behavior is practiced on a voluntary basis rather than being forced, the key challenge in knowledge sharing is how to motivate people to share knowledge: why should I share my knowledge with you? Prior studies examine how both extrinsic and intrinsic motivations affect the intention to share knowledge and/or actual knowledge-sharing behavior.

Bock and colleagues (Bock & Kim, 2002; Bock, Zmud, Kim, & Lee, 2005) studied extrinsic and intrinsic motivations for knowledge-sharing intentions among individuals. Contrary to common belief, they found expected rewards are not significantly related to knowledge-sharing attitudes in a study of 467 employees of four large public organizations (Bock & Kim, 2002). Another study of 154 managers from 27 South Korean organizations (Bock, et al., 2005) nevertheless shows that anticipated extrinsic rewards exert a negative effect on individuals' knowledge-sharing attitudes. More intrinsic motivations such as anticipated reciprocal relationships have a direct and significant relationship with knowledge-sharing attitudes, and a sense of self-worth has a

direct and significant relationship with knowledge-sharing intentions through subjective norms. Similarly, in a study of 80 firms and 96 projects in a variety of industries, Ko et al. (Ko, Kirsch, & King, 2005) found that the effects of extrinsic motivations for knowledge sharing among both sources and recipients of knowledge are insignificant. They did, however, find that the intrinsic motivations of both sources and recipients of knowledge have direct and significant effects on knowledge sharing.

A review of prior studies identifies an important motivation that triggers frequent social interactions, which form the basis of knowledge sharing. Baumeister and Leary (1995) suggested that the need to belong is a fundamental human motivation for frequent and regular social interaction. They defined the need to belong as “a need to form and maintain at least a minimum quantity of interpersonal relationships, [which] is innately prepared (and hence nearly universal) among human beings” (p.499). According to this theory, people are naturally driven toward establishing and sustaining belongingness. Thus, the theory of the need to belong may explain the motivation for social interaction in knowledge sharing through the mechanisms of affiliation motivation (to form social bonds) and relationship commitment (to maintain those bonds). To satisfy this desire, individuals will try their best to form and maintain relationships through frequent social contact and interaction with others. This provides a basis for explaining the motivation for knowledge sharing. The need to belong stimulates goal-directed activities designed

to satisfy it. Motivated by the social goal of satisfying the need to belong, people tend to seek out interpersonal contacts and cultivate possible relationships, and continue doing so until they have reached a minimum level of social contact and relatedness. A recent empirical study found that online knowledge sharing has significant direct relationships with online perceived attachment motivation (the motivation to form a relationship) and online perceived relationship commitment (the motivation to maintain a relationship). Following this line of thought, Ma & Yuen (2010) explored the relationship between interpersonal relationship perspective and online knowledge sharing in a recent study.

## RESEARCH ON ONLINE KNOWLEDGE SHARING PRACTICES

It is commonly argued that the use of information technology improves knowledge sharing through learner participation and interaction in both traditional and online learning. A review of recent empirical studies shows there are several streams of research into online learning that deal with knowledge sharing.

The first stream considers online learning provided through a shared platform on which peer learners interact, often in the form of discussion forums, and in which knowledge sharing occurs through the continuous interaction of peer learners engaging in asynchronous written communication (Mazzolini & Maddison, 2007).

The second stream examines online learning in shared workplaces that allow peer

learners to interact to complete a common task, in which knowledge sharing occurs through continuous interaction among peer learners who learn by doing (Kapur & Kinzer, 2007).

Another stream holds that online learning provides a transparent demonstration of individual outcomes, and that knowledge sharing occurs through continuous exposure to best practices and learning by observation among peer learners (Fischer & Mandl, 2005).

A final strand of the literature highlights that online learning provides a centralized meeting place for community building and that knowledge sharing occurs naturally in the presence of human resources and expertise (Zhang, Scardamalia, Lamon, Messina, & Reeve, 2007).

Many empirical studies of online knowledge sharing measure such sharing in terms of social interaction, participation and engagement, and its relationship to learning. For example, online discussions have been examined by assessing messages posted by learners (e.g. Mazzolini & Maddison, 2007); collaborative learning environments have been investigated by assessing interactional activity, participation patterns, and their effects on performance (Kapur & Kinzer, 2007); and collaboration environments supported by different levels of technology have been assessed by investigating the extent to which learners share knowledge and the resulting effect on individual outcomes

(e.g. Fischer & Mandl, 2005). Knowledge-building communities have been studied by investigating the sharing of learners' knowledge with other members of the community (Zhang, et al., 2007). All of the empirical evidence in these studies indicates that fully utilizing an online learning environment can improve online knowledge sharing.

The examples given below illustrate the best practices using technology to support knowledge sharing in a learning environment.

### **Asynchronous virtual classrooms**

Hiltz and Wellman (1997) established the first asynchronous virtual classroom (the NJIT Virtual Classroom) to empirically test knowledge sharing through virtual community building and asynchronous communication. Many students pursue their college degrees while working full-time. With the help of the virtual classroom setting, such students can interact online with their instructors and other peer learners at any time and in any place (p.49). This virtual classroom project generated a number of subsequent studies. One such study (Wellman et al., 1996) found that of 692 students who completed a post-course questionnaire, the majority (71%) of students stated they had better access to their professors, and 73% found the virtual classroom "more convenient" overall. Collaborative learning took place online and learning communities were found to exist. Fifty-five percent of students surveyed felt more motivated to work diligently on their assignments because other students would read them (p.47). Both students and faculty

members tended to work harder in the virtual classroom because it made it more convenient to interact in class and stay motivated to keep up with the daily contributions of their instructors and classmates. This study provides evidence of how knowledge can be shared between instructors and students and among students themselves regardless of their location, especially through asynchronous communication and collaborative learning activities.

### **Knowledge forums**

Marlene Scardamalia and Carl Bereiter developed the CSILE (Computer Supported International Learning Environments) system at the Ontario Institute for Studies in Education (Singh & Means, August, 1995). Established in 1986, it is considered the first networked system designed for collaborative learning and has been used as a research program within Toronto schools for a number of years. The CSILE system functions as collaborative learning environment that helps form a learning community using the same database capable of displaying both text and graphics. The process of using the learning environment involves student users generating ideas or information nodes under a discussion topic before commenting on such nodes. The dialogue that ensues eventually leads to the accumulation of knowledge. The key benefits of the project are that it helps students' higher order thinking skills and enables students to participate in collaborative projects. Results obtained from using the program show that it has significantly positive

learning outcomes. Even very young children in the fifth or sixth grade can engage in meaningful **knowledge sharing** and deep learning in the course of scientific inquiry. For example, the CSILE system helps students develop their thinking skills. By trying to explain their ideas to their peers and interacting with their peers on academic discussion topics, students improve their communication skills, sharpen their thinking, and gain new knowledge. Moreover, the CSILE system stimulates and facilitates collaborative learning among students. During collaborative project-based activities, students improve their communication skills, cooperative skills, conflict resolution skills, social skills and group processes. In 1995, Knowledge Forum was developed under the World Wide Web environment to replace CSILE and facilitate its ongoing use to help and support knowledge-building communities.

## **MEASUREMENT OF ONLINE **KNOWLEDGE SHARING****

Ko et al. (2005) argued that although many scholars have conceptualized **knowledge sharing** or knowledge transfer, relatively few have attempted to measure it directly (p.68).

Based on the study of Argote and Ingram (2000), Dong-Gil Ko (Ko, et al., 2005) and colleagues define **knowledge sharing** as *the communication of knowledge from a source so that it is learned and applied by a recipient* (p.60). They developed and empirically tested a six-item instrument in which three items address the learning component and

the other three items assess the application component.

Based on the investigations of Zander and Kogurt (1995) and Ko et al. (2005), Brown and colleagues (S. A. Brown, Dennis, & Gant, 2006) examined the perceived value of the knowledge-sharing process to determine whether and how much knowledge sharing occurred. They argued that perceptions are more useful in measuring across-domain knowledge sharing, whereas specific tests of knowledge content are narrow in their application because of their context-specific nature (p.2). Based on person-to-person knowledge sharing, this study put forward and empirically tested a ten-item scale to measure the value of knowledge sharing composed of four components: efficiency, quality, learning, and understanding. The study generated four key findings. First, a knowledge-sharing process helps employees save time in performing their jobs; second, knowledge sharing improves the quality of work performed; third, for knowledge sharing to be truly valuable, it must enhance learning; fourth, for knowledge sharing to be truly beneficial, it must facilitate sharing of the deep structures necessary to apply that knowledge (i.e., understanding).

More recently, Ma and Yuen (2011b) developed and validated an online knowledge-sharing scale. This is a five-item instrument in which two items measure the learning component and three items assess the application component. The scale was empirically tested and validated using two samples from two different online learning

environments (Ma & Yuen, 2011a, 2011b).

## **FUTURE RESEARCH DIRECTIONS**

Although the issue of what factors motivate **knowledge sharing** remains an open question, Facebook usage statistics clearly show that sharing is a fundamentally natural process. For instance, Facebook statistics shows that as of September 2011, the site had 800 million active users (those who had made a return visit in the last 30 days), more than 50% of users logged on to Facebook on any given day, users interacted with over 900 million objects (pages, groups, events, and community pages), more than 2 billion posts were liked and commented on per day, and an average of more than 250 million photos were uploaded on a daily basis (Facebook, 2011). The popularity of this social media site demonstrates that people frequently engage in **social interaction** and sharing. What we are less certain of and which therefore requires further exploration, is what inhibits us from sharing, especially in an online knowledge-sharing context. For example, although it is known that learning conceptions and learners' self-concepts affect learners' approaches to learning and learning outcomes (e.g. Burnett, Pillay, & Dart, 2003), do different learning conceptions affect interaction and **knowledge sharing** among peer learners? Studies of interpersonal relationships have shown that differences between individuals affect how people approach others. Nevertheless, although technology

enhances our ability to communicate, does it enhance online knowledge sharing or inhibit it instead? As a research objective equally important to the study of online knowledge sharing, future studies should develop a valid and reliable measure of whether and how much online knowledge sharing takes place.

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## KEY TERMS\*

**\*Asynchronous Communication:** *A mediated form of communication in which the sender and the receiver are not concurrently engaged in communication.*

**\*Computer Supported Collaborative Learning:** *A kind of learning through sharing and construction of knowledge that takes place via social interaction using a computer or through the Internet.*

**\*Explicit knowledge:** *The kind of knowledge which has been or can be articulated, codified,*

*and stored in certain media that can be readily transmitted to others.*

**\*Extrinsic Motivation:** *The kind of motivation which comes from outside of the individual.*

**\*Intrinsic Motivation:** *The kind of motivation which is driven by an interest or enjoyment in the task itself, and exists within the individual rather than relying on any external pressure.*

**#Online knowledge sharing:** *online communication of knowledge so that knowledge is learned and applied by an individual.*

**\*Tacit knowledge:** *The kind of knowledge which is difficult to transfer to another person by means of writing it down or verbalizing it.*

**\*Virtual communities:** *A social network of individuals who interact through specific media, potentially across geographical and political boundaries in order to pursue mutual interests or goal.*

\*Source: Wikipedia [<http://en.wikipedia.org>];

#Source: Ma, W.W.K. & Yuen, A.H.K. (2011). Understanding Online Knowledge Sharing: An Interpersonal Relationship Perspective. *Computers & Education*, 56(1), 210-219.