Knowledge Sharing Behaviour among Students in Learning Environments: A Review of Literature

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Abstract

Knowledge sharing is critical element for intellectual discourses. However, knowledge sharing is a demanding task that takes time and effort and requires students to be persistent and willing to interact with each other. Recognizing factors that impact knowledge sharing in learning communities is critical. This paper reviews the current literature on knowledge-sharing among students in learning environments, discusses possible factors affecting knowledge sharing behavior among students, and provides future research opportunities. A search of the literature was performed across the ERIC and Academic Search Premier. Empirical studies were included for review if they specifically examined the impact of possible sets of factors on knowledge sharing in learning environments. Key features of articles were classified at the four areas of emphasis: theoretical framework, context of the study, predictive variables, and conceptualization of knowledge sharing and its dimensions. This classification provides a means for educators, instructional designers and curriculums developers to identify key factors involved in successful knowledge sharing process. However, given the limited number of studies currently available, further research is required to establish clear conclusion and recommendation.

Keywords: knowledge sharing, learning environments, conceptualization of knowledge sharing, dimensions of knowledge sharing behavior

1. Introduction

Knowledge sharing is a component of knowledge management and important factor in the organizational world. Critical step in knowledge acquisition is knowledge sharing. According to Brown (1988) students in learning communities are expected to be responsible of their education proactively by "learning with both individual responsibility and communal sharing" (Brown, 1988). This idea suggests the importance and value of knowledge sharing among students.

Knowledge sharing takes place when information or knowledge is shared by individuals within a group and during the process the information or knowledge will also be negotiated and refined until it becomes common knowledge to the group (Yang, 2004). The difference between information and knowledge is that information is like a "message" and can be "unidirectional and unrequested" whereas knowledge is interpreted information by a person's experiences and insights within a context and contains an "element of reciprocity" (Davenport & Prusak, 1999; Connelly & Kelloway, 2003, p. 294). The key challenge in both online and traditional learning is to encourage knowledge sharing through social interaction in various forms. Knowledge sharing is considered as a social phenomenon related to interpersonal relationships and social interactions (Lin, Wu, & Lu, 2012). In general, communities provide setting for participation and presence in the discussion (Vonderwell & Zackariah, 2005) where learners share knowledge and negotiate what they mean (Bober & Dennen, 2001).

Knowledge sharing is the fundamental means through which individuals are capable to re-adapt and reconstruct knowledge by opening up multiple perspectives and to challenge one's understanding while taking into account peers' perspectives. Co-construction of knowledge happens when learners reflect on newly shared knowledge, justify and defined them, reevaluate their thoughts with them, and externalize them by transforming the internal processes into public processes (Choi, Land, & Turgeon, 2005). All these processes lead to deeper understanding and learning of both the content and the processes through which learning occurs (Rogers, 2000). Shared mental models including team-related, task related, and knowledge-related (Fransen, Kirschner, & Erkens, 2011) are also facilitated by sharing the knowledge. Choi, Land, and Turgeon (2005) mentioned that individuals' meta-cognitive knowledge also develop when sharing the knowledge that is (a) "knowledge of cognition (declarative knowledge)," (b) "knowledge about the specific cognitive demands of varied learning tasks (procedural knowledge)," and (c) strategic knowledge of when and where to use acquired strategies (conditional knowledge)." Moreover, students' ability to share knowledge is alongside with corporate world's interest in recruiting employees who possess diversified social communication skills and ability to share a message across to others clearly and unambiguously (Begoña & Carmen, 2011).

Discussion above shows how important knowledge sharing is for improvement of learning process. However, knowledge sharing should be strongly influenced by individuals' willingness to engage in the process and simply telling them that sharing knowledge will make you learn better do not automatically lead to knowledge sharing among members of the community. Because of that, many recent studies have invested considerable attention into finding determinants of knowledge sharing behavior (Chang & Chuang, 2011; Goh & Sandhu, 2013; Hau, Kim, Lee, & Kim, 2012; Staples & Webster, 2008). However, limited attentions have been dedicated to knowledge sharing behavior among students in both traditional and online learning environments, where teaching and learning is the main concern. Most of researches considering knowledge sharing are from organizational and business contexts.

This study, thus, aims to determine the emergent motivational factors that drive knowledge sharing behavior among students. First, we review and integrate the pedagogical literature considering the role of knowledge sharing behavior either in online or traditional learning environments investigating how environmental, team, and individual characteristics influence individual-level knowledge sharing. This review tents to understand factors that influence knowledge sharing between learners of a learning community. Understanding these factors and the rationale behind them would enable curriculum developers, instructors, and instructional designers to come up with advisable strategies to create a more conducive learning environment to facilitate the knowledge sharing behavior. Second, this review concludes with future research needs.

This paper is organized as follows. It begins with a brief explanation of literature review strategy used for identifying relevant source of materials (section 2). In sections 3 and 4, description of method and results are provided. Then, section 5, provides some discussion and conclusion. Lastly, there is a focus on several directions for future research in Section 6.

2. Source of Data

A search of the studies was done across the Academic Search Premier and ERIC databases. In academic institutions Academic Search Premier and ERIC are considered two of the most prominent databases and have been mostly utilized by other researchers as the means for executing literature searches (Hew & Brush, 2007; Rinke, 2008; Luppicini, 2007). These databases were searched for articles published from period October 7, 2000 until October 7, 2013. The search terms utilized for inquiring the databases is listed in Table 1. Four articles were chosen randomly from the available articles in the databases which had the highest relevance with the purpose of this review paper. The snowball method was then used to review citations of the selected articles for additional relevant studies. Note that, research on information and knowledge sharing is interdisciplinary, however, the primary goal of this review article is on reviewing articles published in referred journals in education. Selected articles explored the factors affecting students' knowledge sharing behavior. Review of selected articles was done in a narrative manner rather than a meta-analysis because of the scarce number of empirical studies examining any one of the factors affecting knowledge sharing, various conceptualization and measurement of knowledge sharing, and our propensity in detecting the different theories that have been utilized as the basis for knowledge sharing research.

Table 1. Search strategy used for the Academic Search Premier and ERIC databases

Sequence	Keyword
1	Knowledge sharing behavior
2	Factors affecting students' knowledge sharing behavior
3	Distance education and knowledge sharing
4	Sharing knowledge in distance education
5	Educational context and knowledge sharing

3. Method

Each individual empirical article was the basic unit of analysis. Each article was read and its content was analyzed and classified into the following categories to help explain the key features of the study. Note that for categorization of predictive variables we used the framework suggested by Wang & Noe (2010) who organized predictive variables of knowledge sharing based on five areas including organizational context, interpersonal and team characteristics, cultural characteristics, individual characteristics, and motivational factors. Additionally, Ford (2004) categorized a number of operationalizations for the construct knowledge sharing reviewing the organizational literature: (a) "intention or willingness to share knowledge," (b) "what one should share," (c) "what one normally shared," and (d) "what one does actually share." Based on these operationalizations we considered whether authors measured intentional or actual knowledge sharing behavior. Some studies have further bifurcated the knowledge sharing into two dimensions: (a) knowledge collecting and (b) Knowledge donating (Kim & Lee, 2013) or consistently, knowledge seeking and (b) knowledge sharing (Tseng & Kuo, 2010). So, we also address these dimensions of knowledge sharing when considering conceptualization of knowledge sharing behavior. Here are the categories we utilized for explaining the key features of the studies.

1) Theoretical framework (e.g., social power theory).

2) Context (e.g., distance or traditional settings).

3) Predictive variables (e.g., environmental context, interpersonal and team characteristics).

4) Conceptualization and dimensions of knowledge sharing (e.g., actual or intention, knowledge seeking or knowledge sharing).

4. Results

Four articles were qualified for coverage for this review. One study investigated the influence of teacher's powers and interaction on knowledge sharing behavior in distance-learning environment. One examined the effect of classroom, technological, and individual factors on knowledge sharing behavior in traditional classroom. One study explored the role of interpersonal relationship on knowledge sharing behavior in distance education. One examined the impact of students' characteristics, motivational factors and environmental factors on knowledge sharing behavior in traditional classroom. Table 2 summarizes the key features of these studies.

Table 2. Key features of the reviewed studies

Study	Theoretical Framework	Context	Predictive Variables					Conceptualization and Dimensions
			Environmental Factors	Interpersonal and Team Characteristics	Cultural Characteristics	Individual Characteristics	Motivational Factors	
1	Social power theory	Virtual team	Teacher's power	Interaction	-	-	-	Actual, both dimensions (seeking and sharing)
2	The need to belong theory	Online classroom discussion	-	Perceived online relationship	-	-	Perceived online attachment	Actual, both dimensions (seeking and sharing)
3	Riege (2005)'s	Traditional classroom	1. Instructor support	-	-	1. Student's ability	Student's willingness	Actual, only sharing dimension

Study	Theoretical Framework	Context	Predictive Variables					Conceptualization and Dimensions
			Environmental Factors	Interpersonal and Team Characteristics	Cultural Characteristics	Individual Characteristics	Motivational Factors	
	categorization	discussion	2. Technology availability 3. Technology support			2. Degree of competition		
4	-	Traditional classroom discussion	1. Teamwork 2. Instructor attitude	-	-	1. Greed 2. Degree of competition	Trust	Actual, only sharing dimension

4.1 More Details about the Studies

Study 1: Teacher's Power, Interaction, and Knowledge Sharing

Liao (2006) conducted a study among 103 undergraduate students in a distance learning course using the social power framework (French & Raven, 1959) to study the relationships between teacher's three powers (reward, punishment, and legitimacy), interaction (learners' perceived degree of interaction with other learners), knowledge sharing, and learning satisfaction. Social power theory focus on one party's capability to influence a target person' behavior, attitudes, opinions, objectives, needs and values (Yukl, 2002). Data was collected using survey questionnaire. Liao viewed knowledge sharing behavior as "the degree to which students actually share their knowledge with their classmates or teachers for course tasks". Liao measured actual knowledge sharing behavior using a four items scale that assessed two dimensions of knowledge sharing behavior as "sharing" and "seeking". The item "Learner will try to recognize others' viewpoints" was designed to measure individuals' knowledge seeking behavior. The same approach was also utilized in several organizational researches when measuring knowledge sharing (see for example Kim, 2010; Tseng & Kuo, 2010). The results illustrated the direct influence of students' perceived interaction on the knowledge sharing behavior. Moreover, except the teacher's reward power the other two powers (punishment, and legitimacy) did not show strong impact on learner's knowledge sharing behavior and interaction.

Study 2: Perceived Online Relationship Commitment, Perceived Online Attachment Motivation, and Knowledge Sharing

Ma and Yuen (2010) utilized the theory of the need to belong (Baumeister & Leary, 1995) to examine the motivation for social interaction and knowledge sharing behavior in learning process through the mechanisms of affiliation motivation (to form social bonds) and relationship commitment (to maintain those bonds) among 581 undergraduate students. People naturally have tendency 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. Such tendency is explained by the theory of "the need to belong." Baumeister and Leary (1995) defined the need to belong as "a need to form and maintain at least a minimum quantity of interpersonal relationships, [which] is innately prepare (and hence nearly universal) among human beings" (p. 499). Perceived online attachment motivation was defined as "the degree to which an individual believes that he or she can improve his or her social interaction and the sense of communion with others on an online learning platform." Perceived online relationship commitment was defined as "the degree to which an individual believes that he or she can persist in a relationship with others on an online learning platform." Survey questionnaire was used for collecting data. Ma and Yuen (2010)'s conceptualization of knowledge was adapted from (Ko, Kirsch, & King, 2005). They defined individual online knowledge sharing behavior as "the online communication of knowledge so that knowledge is learned and applied by an individual." They measured knowledge sharing behavior using a five items scale measuring behaviors that occur when learning takes place in an online learning context such as understanding, implicating and applying. So, in such process both dimensions of knowledge sharing are performed (sharing and seeking). The study results showed that, together, perceived online attachment motivation and perceived online relationship commitment explain 71 percent of the variance observed in online knowledge sharing behavior. Three main findings of the study were: (a) perceived online attachment motivation (POAM) had a significant direct positive effect on online knowledge sharing behavior (OKSB), (b) perceived online relationship commitment (PORC) had a significant direct positive effect on perceived online attachment motivation, (c) perceived online relationship commitment (PORC) was fully mediated by perceived online attachment motivation (POAM) and showed only an indirect significant effect on online knowledge sharing behavior

(OKSB).

Study 3: Ability to Share, Willingness to Share, Instructor Support, Degree of Competition, Technology Availability, Technology Support, and Knowledge Sharing Behavior

Wangpipatwong (2009) used (Riege, 2005)'s categorization of associated factors to knowledge sharing behavior and investigated the influence of individual factors (ability to share and willingness to share), classroom factors (instructor support and degree of competition with the classmates), and technological factors (technology availability and technology support) on students' knowledge sharing behavior. Data were collected using questionnaire from 207 students from a university in Bangkok, Thailand. In this study knowledge sharing behavior refers to activities of provision of working information, new knowledge and ideas, and answering the questions of classmates. A three items scale was used for measuring actual knowledge sharing behavior from the sharing dimension without consideration of seeking behavior. Results showed that technology support is the main first variable significantly affecting knowledge sharing of students followed by student's ability to share and degree of competition with the classmates. However, student's willingness to share, instructor support, and technology availability had no influence on knowledge sharing of students.

Study 4: Student Greed, Perceived Competition, Perceived Trust, Attitudes toward Teamwork, and Knowledge Sharing Behavior

Chen, Koch, Chung, & Lee (2007) conducted a study in the classroom settings to explore the influence of student greed, perceived competition with classmates, perceived trust for classmates, positive attitudes toward teamwork, and students' perception of instructor support on knowledge sharing. Actual knowledge sharing was measured using five items which all considered sharing dimension of knowledge sharing behavior. Knowledge sharing in this study was, again, comprises of activities of provision of working information, new knowledge and ideas, and answering the questions of classmates. Authors found that trust, teamwork, and instructor attitude were positively correlated with greater knowledge sharing behavior. However, student Greed negatively influenced their willingness to share knowledge. Relation between competition and knowledge sharing could not be tested because of problem within the scale. This study has not drawn upon any theoretical foundations which is quite negative point of this article.

5. Discussion and Conclusion

So what are the main factors affecting students' knowledge sharing behavior in learning contexts? At this moment, our conclusions are limited due to the scarce available literature focusing on knowledge sharing behavior in the educational context. Indeed, articles measuring knowledge sharing behavior are all related to organizational and business settings. We found that empirical studies of online learning often measure online knowledge sharing in terms of participation and interaction (e.g., Mazzolini & Maddison, 2007; Kapur & Kinzer, 2007; He, 2009). However, knowledge sharing is a complex process and differs from interaction and participation and cannot be simply assessing through counting frequency of interactions.

Based on review of the four studies, the following conclusions are reported. From the environmental factors, instructor role is critical as influential factor that facilitates the sharing of knowledge, in both online and traditional settings. However, the study 3 and the study 4 that examined the instructor support within the traditional classroom settings showed inconsistent results. In study 4 authors found instructor support to be positively associated with students' knowledge sharing behavior while study 3 found a negative relationship. The contradictory results suggest that the relationship may be contingent on other factors such as students' personality trait, cultural characteristic, perceived task value, and so on. Second, the limitations in number of studies considering the role of other factors investigated in selected studies suggest that the conclusions of the studies should be interpreted with caution. Although factors of interaction (interpersonal and team characteristic), perceived achievement and student willingness (motivational factors), student ability and degree of competence (individual characteristics), and technology support (environmental context) showed positive association with knowledge sharing behavior, generalizability of results is not possible.

In sum, although the advantages of knowledge sharing has been recognized in the organizational knowledge sharing literature (e.g., Mesmer-Magnus & DeChurch, 2009; Cabrera & Cabrera, 2005), it is somewhat surprising that little research have been conducted in educational settings considering knowledge sharing behavior among students.

6. Future Research Directions

Knowledge sharing, mostly in organizational research is determined using different theoretical perspectives. Among theories, theory of reasoned action (Casimir, Ng, & Cheng, 2012); theory of planned behavior (Jeon,

Kim, & Koh, 2011); theory of motivation (intrinsic and extrinsic motivation); social capital theory (Zhao, Lu, Wang, Chau, & Zhang, 2012); social identity theory (Kim, Zheng, & Gupta, 2011); social cognitive theory (Chiu, Hsu, & Wang, 2006); and uses and gratifications (Tonteri, Kosonen, Ellonen, & Tarkiainen, 2011) are of the most successful ones in explaining why people share or are willing to share knowledge. However, only two of the studies we reviewed did explicitly ground their research in a theory. Future research should examine knowledge sharing from different theoretical perspectives and investigate the potential mechanisms through which knowledge sharing can be fostered. Moreover, future studies using variables of social interdependence theory such as psychological safety (Zhang, Fang, Wei, & Chen, 2010), individuals' characteristics and cultural characteristic (Mooradian, Renzl, & Matzler, 2006; Ardichvili, Maurer, Li, Wentling, & Stuedemann, 2006) may help increase our understanding of the conditions under which knowledge sharing is likely to occur.

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