Examining the Social and Technical Factors Influencing School Teachers Knowledge Sharing Intentions in a Teachers Online Professional Community

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Abstract: There is a growing recognition to the importance in using online communities of practice (COPs) as a model for teacher's professional development and as a knowledge management platform. The objective of this research was to examine factors that promote or discourage school teachers' knowledge sharing intention in their online professional community. The finding of the research provides empirical support for the overall structure theorized in the research model. Knowledge sharing intention was predicted by teachers' attitude towards knowledge sharing, subjective norm and perceived behavioral control. The teachers' perceptions of reciprocity, extrinsic rewards were positively associated with attitude towards knowledge sharing. The perceptions of loss of knowledge power had a negative effect on the attitude. Organizational climate positively influenced teachers' subjective norm. Additionally, facilitating tools and technology was positively associated with high levels of perceived behavioral control towards knowledge sharing. Based on the findings, the study discussed implications for the theory and practice

1. Introduction

Knowledge Management is ingrained in many disciplines, including business, economics, psychology, and information management and experiments are just beginning in education. Knowledge management is, in fact, in tune with the culture of education and education should be leading the way in making knowledge management a key part of its culture, education should be the natural home of the discipline (Sallis and Jones, 2002). Researchers in education field and knowledge management suggested the creation of online communities of teachers as a new teachers' professional development model and as knowledge management platform, a community of practice can provide both tacit and explicit knowledge sharing opportunities among teachers. (Petrides and Nodine, 2003).

(Yang and Chen, 2007) argued factors impacting knowledge sharing should be the most important consideration in any knowledge management effort, the basic assumption of this research is to uncover factors that motivate or inhibit teachers' intentions to share knowledge in their online professional community.

2. Literature review

The original concept of "communities of practice" offered by (Lave and Wenger, 1991) they envisioned a model of apprenticeship, based on socialization-related learning. Learning activities include the adoption of knowledge that is shared by peers and subject-matter experts, as well as the discovery or creation of new knowledge. The basic assumption underlying the theory of cops is that engagement in social practice is the fundamental process by which we learn and so become who we are. Community of practice has been defined as "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 et al., 2002). There is much less literature available on KM in higher education than in business and industry (Santo, 2005). Thus understanding the motivations prompting people to share knowledge or participate in virtual communities in a business world examined firstly. Most recent studies regarding knowledge sharing in business and industry are based on different theories to find out factors affecting knowledge sharing. According to the theory of reasoned action (TRA) proposed by (Ajzen and Fishbein, 1980), beliefs and evaluations would affect individual's attitudes while normative beliefs and motivation to comply would affect subjective norms. Next, attitudes and subjective norms would affect individual's intention, and intention has influence on behavior in sequence. Based on the TRA, (Bock et al., 2005) find that attitudes toward and subjective norms with regard to knowledge sharing as well as organizational climate affect individuals' intentions to share knowledge. In

addition, they find that reciprocal relationships would affect individual's attitudes toward knowledge sharing while both sense of self-worth and organizational climate would affect subjective norms. As for anticipated extrinsic rewards, they play a negative role on attitudes toward knowledge sharing. Whereas (Taylor, 2006) suggest that the group financial incentives inspired more knowledge sharing than did either tournament or piece-rate. Results suggest that managers should carefully consider incentive structures in computer-based systems because incentives potentially affect knowledge sharing. (Chang et al., 2008) adopt a cost-benefit framework to predict the users' contribution behavior on blogs and forums. Their research results show that users' intention toward knowledge sharing is affected by extrinsic benefits (reputation and reciprocity), intrinsic benefits (enjoy helping and self-efficacy), and costs (convenience and interaction). Although there is a growing recognition of the importance in using online COPs as a model for teachers professional development, moreover; teacher's professional Virtual community acted as a knowledge management platform in education field, few empirical studies have been undertaken to identify how online COPs work and how they can be sustained in an educational community. Moreover; knowledge sharing motivation factors differ by national and ethnic cultures (Hambrick et al., 1998; Hutchings and Michailova, 2004) and these factors could not be generalized globally, and that impose to examine knowledge sharing motivation factors and strategies for each ethnic group.

3. Research Model and hypotheses

The research model (Figure. 1) uses theory of planned behavior (TPB) (Ajzen, 1991), and social exchange theory as theoretical framework and augments it with organizational climate factors that are believed to influence individuals' knowledge sharing intentions, that influence knowledge sharing behaviors of teachers. The basic idea of the research model according to theory of planned behavior, that the primary determinants of an individual's behavioral action are intention. Intention is an indication of individual's readiness to engage in a behavior. Intention in turn is a function of individual's attitude towards a behavior, subjective norm (SN) and perceived behavioral control (PBC) with each determinant weighted for its significance in relation to the behavior and population in question. Attitude toward the behavior refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question. Perceived Behavioral Control (PBC) is based on control beliefs. Control beliefs are beliefs about the perceived presence or absence of factors that may facilitate or impede the performance of behavior in interest. Subjective Norm (SN) is based on normative beliefs. Normative beliefs are beliefs about the perceived social pressure from important referent group to perform or not to perform a specified behavior. Normative beliefs together with the motivation to comply with these referent group expectations determine the subjective norm.
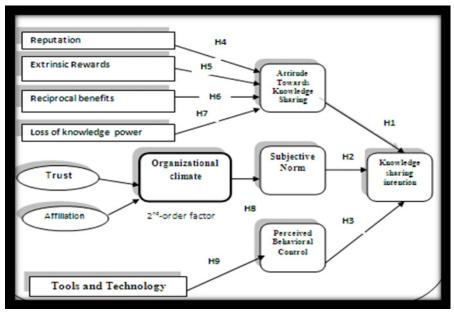

Figure 1 -Research Model

TPB argues that the best predictor of behavior is intention which is determined by attitude and subjective norm and Perceived Behavioral Control. Thus, we hypothesized

H1- *there is a significant relation between teachers' attitude toward knowledge sharing and teachers' intention to share knowledge.*

H2 - *there is a significant relation between teachers' subjective norm supportive of knowledge sharing and teachers' intention to share knowledge.*

H3- *there is a significant relation between teachers' perceived behavioral control towards knowledge sharing and teachers' intention to share knowledge.*

Attitude towards knowledge sharing is formed from behavioral beliefs and refers to the degree of positive/negative feelings an individual has towards the intention to share knowledge with other members of the organization. Social exchange theory posits that social exchange engenders social rewards such as feelings of approval, status and respect. (He and Wei, 2009; Hsu and Lin, 2008; Shin et al., 2007; O'Dell and Grayson, 1998) Suggest that employees share their best practices because of their desire to be recognized by experts and peers, and that leading to the fourth hypothesis

H4- *there is a significant relation between teacher's reputation enhancement and teachers 'attitude toward knowledge sharing.*

Knowledge sharing involves costs for the participants. These costs may include time, energy, potential loss of ownership, power etc. Previously published studies highlight the importance of economic incentives and observe that individuals engage in knowledge sharing when they expect to receive economic benefits such as increased pay, bonuses, job security, career advancement etc. for sharing knowledge (Ba et al., 2001; Davenport and Prusak, 1998; Chang et al., 2008; Hsu and Lin, 2008). This leads to the fifth hypothesis:

H5- *there is a significant relation between teacher's extrinsic rewards and teachers 'attitude toward knowledge sharing.*

Social exchange theory (Blau, 1967) describes human behavior in terms of social exchanges. Social exchanges differ from economic exchanges in that the value in the exchange behavior is not clearly defined. Prior research suggests that individuals engage in knowledge sharing with the expectation that their future knowledge requests will be met by others. This leads to the sixth hypothesis.

H6- *there is a significant relation between teacher's Perceived Reciprocal relationship and teachers 'attitude toward knowledge sharing.*

As knowledge is considered as a source of power, individuals may fear losing the power, if that knowledge is transferred to others. (Davenport and Prusak, 1998; Gray, 2001). Thus that leading to the seventh hypothesis

H7- *there is a significant relation between teacher's loss of knowledge power and teachers 'attitude toward knowledge sharing.*

The subjective norm construct, defined as perceived social pressure to perform or not perform a behavior (Ajzen, 1991) Sociologists see social action as largely governed by institutional structures, e.g., social norms, rules, and obligations (Bock et al., 2005). Related to these institutional structures are three organizational climate factors for knowledge sharing, which we have derived from contextual factors in prior literature: fairness (a trusting climate), and affiliation (sense of togetherness). Organizational climate is the shared values, norms, meanings, beliefs, myths and underlying assumptions within an organization. Organizational climate guides the employees behavior by conveying to them what behavior is appropriate and desirable. Subjective norms are formed when employees internalize and evaluate organizational values and norms. Previously, the researchers identified two aspects of organizational climate as being particularly conducive to knowledge sharing: trust, and affiliation. The degree of trust has an impact on collaborative efficiency in the organization. (Bock et al., 2005). Therefore, trust is regarded as one of the important contextual factors affecting knowledge contribution in prior research. Trust is an implicit set of beliefs that the other party will refrain from opportunistic behavior and will not take advantage of the situation (Hosmer, 1995). Due to the nature of virtual community, trust has been recognized as a critical factor in fostering the voluntary online cooperation between strangers (Ridings et al., 2002; Hsu, et al, 2007). Finally, affiliation, defined as the perception of a sense of togetherness among an organization's members, reflects the caring and pro-social behavior critical to inducing an organization's members to help one another. This leads to the eighth hypothesis.

H8- *there is a significant relation between teachers' perceived organizational climate characterized by trust, and affiliation and teachers subjective norm toward knowledge sharing*

Information and communication technologies in the form of knowledge management systems (KMS) facilitate collaborative work and enable knowledge sharing, but only if they are actually used. Previous research in information systems suggests that individuals act in accordance to their beliefs about the availability and ease of use of the systems. So it is hypothesized that tools and technology that are perceived to be highly available and ease to use influence knowledge workers perceived behavioral control towards knowledge sharing. This leads to the ninth hypothesis.

H9- *there is a significant relation between teachers' perceived availability and ease of use of Tools and Technology and teachers' behavioral control towards knowledge sharing*

4. Research methodology and analysis:

To test the proposed research model, we adopted the survey method for data collection, and examined our hypotheses by applying the partial least squares (PLS) method to the collected data. 363 school teachers enrolled in integrating technology in the education program in Syria were surveyed. All surveys were checked for quality of completion and completeness. Seven surveys with missing data and six other surveys containing incompatible answers were excluded. The remaining 214 questionnaires were used in the statistical analysis. We developed the items in the questionnaire either by adapting measures that had been validated by other researchers or by converting the definitions of constructs into a questionnaire format.

4.1 Analysis Method

PLS (Chin, 1998) was used as it allows latent constructs to be modeled either as formative or reflective indicators as was the case in our data, and it makes minimal demands in terms of sample size to validate a model compared to alternative structural equation modeling techniques. We used WarpPLS Version 1.00 in our analysis. Following recommended two-stage analytical\ procedures (Hair et al. 1998), confirmatory factor analysis was first conducted to assess the measurement model; then, the structural relationships were examined. Since the model contains a second-order variables (organizational climate), we created superior second-order constructs using factor scores for the first-order constructs (Chin , 1998).

4.2 Measurement Model

To validate our measurement model, two types of validity were assessed: convergent validity, and discriminated validity

4.3 Assessment of the Structural Model

With the adequacy of the measurement model established, the structural model was evaluated and hypotheses were tested. The structural model indicates the causal relationships among the latent constructs in the research model. Assessment of structural model was done first by determining the predictive power of the model and second by analyzing the hypothesized relationships among the latent constructs proposed in the research model. The R-square values of the dependent variables determine the predictive power of the research model and the path coefficients evaluate the strength of the hypothesized relationships. Validation of structural model was accomplished with WarpPLS 1.0. The results of the analysis are depicted in Figure 2 and summarized in Table 3. As is evident from figure 2, the model has high predictive power. It explains approximately 79 % of the variance in the knowledge sharing intention (INT)). The attitude towards knowledge sharing (ATK), subjective norm (SNK) and perceived behavioral Control (PBK) respectively account for 65.6%, 19.6% and 4.4% of the variance. Additionally, 8 of the 9 paths were found to be statistically significant. The standardized path coefficients ranged from 0.023 to 0.601. The overall fit of the model was good.
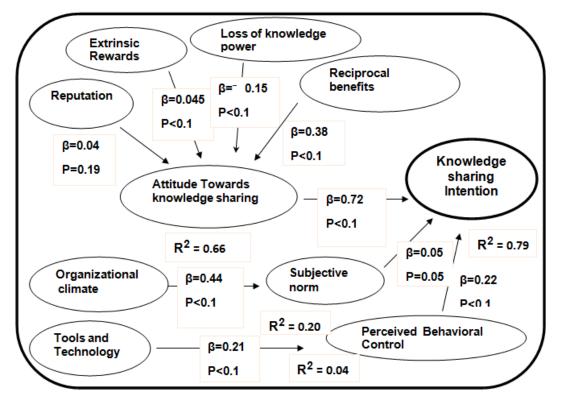
Figure 2 Results of WarpPLS 1.0 Analysis

Table 1 - Research Hypotheses

	Hypothesis	Results	Path Coefficient
H1	There is a significant relation between teachers' attitude toward knowledge sharing and teachers' intention to share knowledge.	**Accepted**	0.723
H2	There is a significant relation between teachers' subjective norm supportive of knowledge sharing and teachers' intention to share knowledge.	**Accepted**	0.047
H3	There is a significant relation between teachers' behavioral control toward knowledge sharing and teachers' intention to share knowledge.	**Accepted**	0.223
H4	There is a significant relation between teacher's reputation enhancement and teachers 'attitude toward knowledge sharing.	**Not Accepted**	0.036
H5	There is a significant relation between teacher's extrinsic rewards and teachers 'attitude toward knowledge sharing.	**Accepted**	0.449
H6	There is a significant relation between teacher's Perceived Reciprocal benefits and teachers 'attitude toward knowledge sharing	**Accepted**	0.376
H7	There is a significant relation between teacher's loss of knowledge power and teachers 'attitude toward knowledge sharing	**Accepted**	**- 0.146**
H8	There is a significant relation between teachers' perceived organizational climate characterized by trust and affiliation and teachers Subjective Norm toward knowledge sharing	**Accepted**	0.443
H9	There is a significant relation between teachers' perceived availability and ease of use of Tools and Technology and teachers' behavioral control towards knowledge sharing.	**Accepted**	0.209

5. Discussion

We discuss the results in the following sequence: standard TPB constructs (Hypotheses 1, 2, and 3), psychological antecedents to these TPB constructs (Hypotheses 4, 5, 6, and 7), organizational climate (Hypotheses 8), and perceived behavioral control (Hypotheses 9)

5.1 Knowledge Sharing Intention

These findings are consistent with the findings of prior TPB related research (Taylor and Todd, 1995; Bock and Kim, 2002; Ryu et al., 2003; Lin et al., 2004). Attitude towards knowledge sharing had a strong effect on the behavioral intention to share knowledge with a path coefficient of 0.723. The high contribution of attitude towards knowledge sharing suggests that teachers with favorable attitudinal disposition are more likely to engage in knowledge sharing. Perceived behavioral control was found to have significant but moderate effect on behavioral intention with a path coefficient of 0.223, and subjective norm was found to have significant but weak effect on behavioral intention with a path coefficient of 0.047. The significance of subjective norm implies that teachers consider management and peer group expectations of knowledge sharing to be important. Teachers are likely to engage in knowledge sharing when they perceive that their management and peer group value knowledge sharing and are likely to praise the behavior. This finding emphasizes the importance of the social influence of top management and peer group in knowledge sharing. The impact of perceived behavioral control on the intention towards knowledge sharing indicates that teachers are motivated to engage in knowledge sharing to the extent they believe they have the time, resources and opportunities to do so.

5.2 Knowledge Sharing Attitude

The researchers applied a diversity of extrinsic and intrinsic motivational drivers such as extrinsic rewards, reciprocal benefits, reputation enhancement, and perceived loss of knowledge power as antecedents to attitude. Of these antecedents, only three of them emerged as significant predictors of teacher's attitude towards knowledge sharing. These were reciprocal benefits, extrinsic rewards, loss of knowledge power. Reputation enhancement was found not to have a substantial impact, when all the motivators were included into the analysis.

5.2.1 *Reciprocal Benefits*

Correspond with social exchange theory, reciprocal benefits had a significant and positive moderate effect on the teacher's attitude towards knowledge sharing with a path coefficient of 0.376. These finding consistent with the findings of prior research on information exchange, and open source programming communities where generalized reciprocity was consistently found to be an important predictor for knowledge contribution (Constant et al., 1994; Wasko and Faraj, 2000; Lakhani and von Hippel, 2000; Lerner and Triole, 2000). The significance of perceived reciprocal benefits provides some indication that teachers are likely to engage in knowledge sharing with the expectation of receiving future help from others in return for sharing knowledge.

5.2.2 *Loss of Knowledge Power*

Loss of knowledge power had a significant negative effect on the Teachers attitude towards knowledge sharing with a path coefficient of -0.146. This finding suggests that the more the teachers hold beliefs that sharing knowledge reduces their power within the organization, the less likely they are to engage in knowledge sharing. The finding agrees with prior published research that highlights the influence of knowledge on the distribution of power within institutions (Gray, 2001; Hall, 2004).

5.2.3 *Reputation enhancement*

Reputation enhancement demonstrated an insignificant, weak positive effect on the teachers' attitude towards knowledge sharing with a path coefficient of 0.036, for this sample of teachers. Reputation enhancement were not as important as other perceived benefits such as reciprocity, extrinsic rewards and knowledge power. The finding disagrees with prior published research in developed countries (He and Wei, 2009; Hsu and Lin, 2008; Kankanhalli et al., 2005; Shin et al., 2007; Wasko and Faraj, 2005), and this finding could be justified as this research conducted in Syria which is a developing country where there are cultural, economic, and wage scale differences.

5.2.4 *Extrinsic rewards*

Correspond with Economic exchange theory extrinsic rewards had a significant and strong effect on the teacher's attitude towards knowledge sharing with a path coefficient of 0.449. The finding agrees with prior published research (Bonner et al., 2000; Drago and Garvey, 1998; Gale, 2002; O'Dell and Grayson, 1998). That suggests institutions can encourage sharing by implementing an incentive system with particular focus on group-based financial incentives, the effectiveness of financial incentives to induce sharing prior to the formation of relational intimacy in newly formed groups. Contrary to, the finding disagrees with another prior published research that suggests that financial incentives

are frequently ineffective (Bock and Kim, 2002) and (Bock et al., 2005) find that expected rewards are unrelated to knowledge-sharing attitudes.

5.3 Subjective Norm

5.3.1 *Perceived Organizational Climate*

Organizational climate characterized by two dimensions: affiliation, and trust were applied as an antecedent to subjective norm. Similar to (Bock et al., 2005) study, organizational climate was found to have substantial impact on subjective norm with a path coefficient of 0.443. The higher the perceptions of organizational climate to be conducive of knowledge sharing, the higher was the formation of subjective norm towards knowledge sharing. Organizational climate explained about 19.6 percent of variance in subjective norm towards knowledge sharing.

5.3.2 *Perceived Behavioral Control*

Tools and Technology

Tools and technology that facilitate knowledge sharing demonstrated a strong positive relationship with perceived behavioral control towards knowledge sharing at 0.21. This finding suggests that the teachers are inclined to use tools and technology to share knowledge; to the extent they have high perceptions regarding their availability and the ease of use. Tools and technology explained about 4 percent of the variance in the perceived behavioral control. This is a significant finding since institutions are investing heavily in the development and acquisition of information and communication technologies in the form of knowledge management systems (KMS).

6. Research contributions and limitations

The research has provided a number of contributions to the academic literature and practical application, from theoretical contribution. First, the study suggests a holistic perspective on the knowledge sharing intention by developing an intention based theoretical model using the theory of planned behavior (TPB) and augmenting it with constructs from social exchange theory, economic exchange theory. The predictors in the model explained about 79 percent of the variance in the behavioral intention to share knowledge, suggesting that the supposed model adequately conceptualizes the knowledge sharing intention. Second, this study extends prior research by identifying a variety of extrinsic and intrinsic motivational drivers that are likely to influence knowledge sharing intention in developing countries and provides empirical evidence regarding the efficacy of these motivational drivers.

From a practical contribution, the results of the study have many implications for educational institutions initiating or sustaining their teachers' online community of practice as a model for professional development. First, prior to launching online community of practice, institutions should create an environment that is conducive to knowledge sharing. Institutions should develop and nurture cultural norms, practices and processes that build trust, collective cooperation and positive social interactions among teachers, and group-based incentives. Second, management should demonstrate its support for knowledge sharing. Supportive organizational climate and intensified management commitment towards knowledge sharing promotes knowledge sharing behaviors. The study findings indicate that teachers are likely to be influenced by the expectations of management and peer group in deciding to engage in knowledge sharing. So it may even be appropriate to exert some pressure on teachers to share knowledge through the social influence of top management and peer group. Third, the results of the study suggest that attitude towards knowledge sharing behavior affects intention and further the actual behavior of teachers. Institutions should promote knowledge sharing intention by managing factors that influence teachers' attitude towards knowledge sharing. Institutions should structure the knowledge sharing initiatives in such a way that they support the social concerns teachers have for such things as realizing reciprocal benefits, extrinsic rewards system that compensate for knowledge power and time expended. Specifically, the level of teachers' perceptions of reciprocity in the organization should be raised by promoting knowledge centric culture and by encouraging teachers to help their colleagues with the knowledge needs. The situations where knowledge needs have been answered must be publicized to demonstrate the positive impacts of knowledge sharing. Fourth, knowledge sharing is time consuming. Institutions should ensure that Teachers have time, resources and opportunities to engage in knowledge sharing. Institutions should allocate time for engaging in knowledge sharing behaviors by integrating it into the work processes. Time needed to engage in knowledge exchanges should not be viewed as a cost factor. Fifth, institutions should employ knowledge management systems to facilitate collaborative work and support knowledge sharing. The results of the study indicate that

teachers' perception of facilitating tools and technology is an important factor in deciding to engage in knowledge sharing.

Finally. Few limitations could arise from the research methods used. First, the research setting for the current study was an educational institution. Respondents were limited to full time school's teachers. As such, the study may limit the extent to which finding can be generalized to the general work force. Future research should replicate the study's findings with larger samples and in different contexts. The study should also be replicated in countries with non Syrian cultures. Second, the study focuses on some of the motivating factors that influence knowledge sharing behaviors of teachers. As such, the antecedents explain only a portion of the variance in the dependent variable (actual knowledge sharing behavior). There may be factors which are not part of this study but may have significant influence on knowledge sharing behaviors.

7. Conclusion

Knowledge sharing has been recognized as the important enabler of knowledge management. To leverage knowledge resources and to support knowledge sharing, institutions are employing knowledge management systems as a platform for teachers' professional development. While knowledge management systems are important, practical implementations have shown that the mere attainability of technology does not guarantee that knowledge will be shared. Citing the growing importance of knowledge sharing to the success of knowledge management and to the survival of organization, both academicians and practitioners have invited to the identification of factors that promote or discourage knowledge sharing intentions in the organizational context. This research endeavored to satisfy the gap in the extant research on knowledge sharing by examining the factors that influence the knowledge sharing intention of teachers. Drawing from multiple streams of research including social psychology, organizational learning, knowledge management, information systems, this research developed an integrated theoretical model and uncover three sets of critical factors: psychological, organizational and technological that are believed to affect the knowledge sharing behaviors. Using a survey of 214 teachers, the theoretical model was validated within the context of a single empirical study. The findings provided significant statistical support for the research model accounting for about 79 percent of the variance in the behavioral intention to share knowledge. 8 of the 9 hypothesized relationships were supported. Knowledge sharing intention was predicted by teachers' attitude towards knowledge sharing, subjective norm and perceived behavioral control. The teachers' perceptions of reciprocal benefits, organizational extrinsic rewards were positively associated with favorable attitude towards knowledge sharing. The perceptions of loss of knowledge power exerted a negative effect on the attitude. Organizational climate positively influenced teachers' subjective norm.

In addition, facilitating tools and technology was positively associated with high levels of perceived behavioral control towards knowledge sharing. Based on the findings, the study debated theoretical and practical implications for sharing knowledge in the community of practice. Overall, the results of the study advance prior research in the area of knowledge sharing by shed light on the determinants of knowledge sharing intention of teachers. The research model profound our collective understanding of the underlying psychological processes that induce knowledge sharing intention. In addition to contributing to theory, the findings of the study also produce insights for practice. The insights could be used by educational institutions in developing realistic environments that are conducive to knowledge sharing. The study may limit the extent to which finding can be generalized to the general work force due to a single case study was examined. Future research should replicate the study's findings with larger samples and in different contexts.

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