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Epistemological beliefs and knowledge sharing in work teams
A new model and research questions

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Abstract

Purpose – The purpose of this paper is to present a knowledge-sharing model that explains individual members' motivation to share knowledge (knowledge donation and knowledge collection).

Design/methodology/approach – The model is based on social-constructivist theories of epistemological beliefs, learning and distributed cognition, and is organized via the mechanism of propositional control, which suggests that attitudes or beliefs largely drive one's behaviors. This paper also explores how epistemological belief systems may influence behavior processes at work.

Findings – The model presented consists of five epistemological belief dimensions consistent with previous theorization about personal epistemologies. This paper demonstrates how sophisticated (as opposed to naive) beliefs on each of these five dimensions can stimulate one's intrinsic desire to engage in knowledge-sharing behaviors.

Research limitations/implications – The model is constrained by the assumptions that learning takes place socially and within a specific context (in this case, the team setting), and that a great deal of knowledge sharing is preferred over little knowledge sharing. This paper adds to the understanding of workplace learning by establishing a possible new antecedent to explain the process of how team members are motivated to engage in knowledge-sharing behaviors.

Practical implications – The model may be used for knowledge management and to understand ineffectiveness in teams. It also may assist in human resource functions including selecting and training team members for knowledge-intensive positions.

Social implications – Epistemology affects collaborative relationships. Collaborations and associated knowledge-sharing behaviors among work team members who design and implement products for public use are imperative toward developing products free from health and safety issues.

Originality/value – This paper provides a model for understanding and developing motivation to engage in individual knowledge-sharing behaviors among work team members, which is considered critical toward an organization's competitive advantage.

Keywords Team learning, Knowledge sharing, Epistemology

Paper type Conceptual paper

Knowledge sharing among an organization's team members is critical for competitive advantage (Grant, 1996; Halawi et al., 2006; Pemberton and Stonehouse, 2000). Research has been attempted to determine characteristics that motivate knowledge sharing among team members. Recent attempts have considered team attributes (Katz et al., 2004; van Emmerik and Brenninkmeijer, 2009) and team member perceptions of fellow members' intentions (Mitchell et al., 2009; Staples and Webster, 2008). Much of this work has linked knowledge sharing to characteristics like trust, empowered leadership, team structure and an atmosphere of respect. Other work has focused on organizational mechanisms like reward systems and initiatives that focus on knowledge outcomes. Consequently, researchers have thus far assumed that knowledge would be shared if the team is characterized by social and structural mechanisms conducive to knowledge sharing or if the members receive sufficient extrinsic rewards for doing so.

But this is not always the case. Even within team contexts that influence member functioning (Mathieu et al., 2008), people often engage in differing amounts of sharing behaviors. There are often a number of barriers to sharing knowledge and the process takes considerable time, effort and energy, and it is not improved with extrinsic rewards (Bock et al., 2005; Hu and Randel, 2014). Thus, an important question to ask is which *intrinsic* motivational factors encourage someone to put forth the effort necessary to engage in knowledge-sharing behaviors.

A stream of research has highlighted the importance of cognitive and interpersonal factors, including personality or demographics as explanations for team knowledge outcomes (Connelly and Kelloway, 2003; de Vries et al., 2006). However, these characteristics tend to remain inflexible and unchangeable. Members' attitudes and beliefs, on the other hand, may be developed, as they are flexible, trainable and learned (Nist and Holschuh, 2005; Schommer, 1990). Yet, despite evidence from cognitive psychology suggesting that an individual's attitudinal and belief cognitions play an important role toward influencing behavior (Ajzen and Fishbein, 1970; Schraw et al., 1995; Weinberg et al., 2015), there is a dearth of research on the role that beliefs play in the knowledge-sharing process. Accordingly, Bauer, Festner, Gruber, Harteis and Heid conclude their 2004 study of beliefs and workplace learning by calling for future investigations into whether an individual's epistemological beliefs influence learning processes and workplace results.

Learning involves a process of detecting and correcting errors, prompts the achievement of greater adaptation and understanding, and ultimately improves team performance (Argyris and Schon, 1978). Given that work teams provide a learning environment that is negotiated and constructed by individuals working within the constraints of a particular context (Billett, 2004), Jakubik (2008) proposes that knowledge management could benefit by incorporating learning theories and accounting for the context in which knowledge is shared and created. To meet these calls, this article proposes a comprehensive and testable knowledge-sharing framework, centered on team member epistemological beliefs, that sheds light on why some team members choose to engage in knowledge sharing. This line of inquiry is important, as organizational learning literature "tends to be overoptimistic regarding the weakness of barriers to learning, so it underemphasizes the difficulties involved in mitigating them" (Brown and Starkey, 2000, p. 108).

Work teams as generators of knowledge

One's ability to use knowledge effectively is bound within social contexts that shape socialization processes and drive conscious learning from and through others as members engage in cooperative work and jointly tackle tasks (Eraut, 2004). Social contexts enable interactional learning processes, including scaffolding and guided participation, which stress the interdependence of learning toward knowledge outcomes (Cullen, 1999). This is consistent with contemporary thought regarding organizational learning occurring through *communities of practice*, which focus on participation over the stockpiling of information (Örtenblad, 2001), and refer to organizational learning as a system of individuals working and learning interdependently in embedded contexts (Dixon, 1992). Work teams are collectives of individuals who work together interdependently toward shared goals (Mathieu *et al.*, 2008), and thus, work teams represent systems of interacting workers to form what Backström (2004) terms *collective learning*. Further, as work teams represent "groups within an organization that share information and experience related to a common problem", they meet Hu and Randel's (2014, p. 9) definition of a community of practice. Moreover, collective team learning involves acquiring, sharing and combining knowledge (Mathieu *et al.*, 2008), and accordingly, team learning is considered a subset of a learning organization (Knapp, 2010).

Teams research commonly discusses how "the pooled value of a characteristic is presumed to affect a team, regardless of how that characteristic is distributed among members" (i.e. the "central tendency of members' attributes") (Barrick *et al.*, 1998; Mathieu *et al.*, 2008, p. 434; Stewart, 2006). This approach highlights the individual team member's approach to work situations, consistent with extant conceptualizations of knowledge as residing within individuals and, "more specifically, in the employees who create, recognize, archive, access, and apply knowledge in carrying out their tasks" (Bock *et al.*, 2005, p. 88).

Knowledge sharing within the context of a work team

To enable knowledge sharing in organizations, members must have access to an arena in which to engage in interpersonal dialogues to share their experiences and knowledge with one another. Work team interactions provide a context in which individuals can engage in such dialogue (Engström, 2003), as they involve a group of individuals embedded in a larger social system who work interdependently to perform tasks (Guzzo and Dickson, 1996). By highlighting the social interdependence of team members, this definition accounts for the social-constructivist nature of knowledge construction and individual members' contributions toward a shared understanding (Tillema, 2006). Thus, the social context in which members exchange knowledge is inseparable from the knowledge sharing itself, a concept extant research has highlighted. For instance, Leppälä (2012) discusses how knowledge is socially constructed but individually absorbed, and Okhuysen and Eisenhardt (2002, p. 370) add nuance to this sentiment with their claim that "while knowledge is *owned* at the individual level, the integration of this knowledge to a collective level is necessary". Accordingly, the knowledge-sharing intentions and behaviors described in Figure 1 are bound within a team context.

Methodology

The proposed model was formed by organizing theories of epistemological beliefs, learning and distributed cognition based on the mechanism of propositional control,
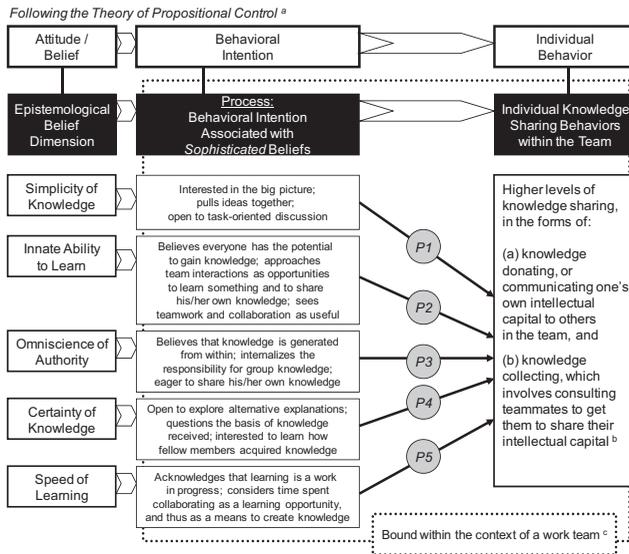
Sources: [a]Dulany (1968), Fishbein (1967); [b]follows de Vries's (2006) definition of knowledge sharing; [c]follows Guzzo and Dickson's (1996) definition of a team

Figure 1.
A model of
epistemological
beliefs motivating
knowledge-sharing
behaviors

which suggests that attitudes or beliefs largely drive one's behaviors (Ajzen and Fishbein, 1970). By considering personal epistemologies (Nussbaum and Bendixen, 2003; Schommer, 1990) through a lens of propositional control, this synthesis of beliefs, behavioral intentions and expected behavioral output considers how epistemological belief systems influence knowledge-sharing behavior in work teams. Translated into a discussion of how learning- and knowledge-related epistemologies influence one's participation in knowledge-sharing behaviors, the model presented in Figure 1 suggests that a member's flexible, trainable and learned epistemological beliefs drive intentions to either share or withhold knowledge within a team setting, and demonstrates how sophisticated (as opposed to naive) beliefs on each dimension stimulate one's intrinsic motivation to engage in knowledge-sharing behaviors.

Literature review and proposition development

A focus on social knowledge construction emphasizes both the social context and also individual members' contributions to shared, collective understanding within that context (Tillema, 2006). Thus, a social-constructivist theory of knowledge sharing requires two components: the context within which knowledge is shared (in this case, the team setting) and the distinct contribution of each individual involved. While a number of studies have examined the ways in which social contexts can promote knowledge-productive behaviors among organizational members (Tillema, 2006; Tsai, 2001), existing research has focused largely on the ways in which these environments are physically arranged and how these arrangements foster or discourage members to develop, exchange and communicate their knowledge with one another (Tillema, 2006).

Consequently, while the literature clearly identifies the benefits of sharing knowledge in teams, it tends to overlook the individual team members' contributions to this shared construct, although individual team member perspectives and contributions play an important role in team knowledge outcomes (Khedhaouria and Ribiere, 2013), the individual team member attitudes and attributes that drive knowledge-sharing behaviors remain unclear (Connelly and Kelloway, 2003).

Individuals sharing knowledge in teams
Consistent with Grant's (1996) knowledge-based perspective of the firm, theories of the learning organization argue that organizational knowledge is created, in part, when individual members communicate their learning and knowledge with coworkers (Nahapiet and Ghoshal, 1998). This emphasizes the central and necessary contributions that individuals play in the knowledge-creation process (Liu and Liu, 2011). An effective knowledge-sharing system facilitates interaction and strengthens the collective knowledge base to contribute to collective learning (Wang and Ahmed, 2003). de Vries *et al.* (2006, p. 116) define knowledge sharing as "the process where individuals mutually exchange their (tacit and explicit) knowledge and jointly create new knowledge". These authors further explain that "every knowledge-sharing behavior consists of both bringing (or donating) knowledge and getting (or collecting) knowledge". This definition of knowledge sharing is consistent with contemporary thought that:

> […] knowledge can be considered as an act of someone who makes an effort to capture an object by thoughts and to form a proper representation of this object and the understanding resulting from this action (Browaeys and Fisser, 2012, pp. 208-209).

This concept of knowledge construction in organizations portrays employees as active constructors of meaning (Cullen, 1999; Knapp, 2010), and moves beyond the mere concept of knowledge sharing involving primarily making one's own knowledge available to others (Dixon, 1992; Nonaka, 1991). Rather, it considers organizational learning as changes in the state of knowledge that involve "knowledge creation, acquisition, and dissemination" (Wang and Ahmed, 2003).

Cognition theories of behavior help to explain the team knowledge-sharing process and recognize the social sources that drive an individual's motives and goals (Pintrich *et al.*, 1993). People experience a wide variety of needs, and these needs, which are activated by environmental conditions such as that of working in a team, often motivate an individual to behave in such a way as to satisfy those needs (Horner, 1997). This process is consistent with distributed cognition theory, which extends the organization of cognitive systems beyond the individual to encompass interactions between individuals (Hollan *et al.*, 2000). Thus, an individual's drive to satisfy his or her needs is triggered by and embedded in organizational contexts, like the team setting in which one works. Nonaka (1994) considers one's intentions to be an enabling condition of the knowledge-creation process. As discussed in the following section, the model in Figure 1 displays a process through which a team member's beliefs trigger associated behavioral intentions that influence his or her contribution to team knowledge-sharing behaviors.

Beliefs as motivators to engage in knowledge sharing
Dulany's (1968) expansion on Fishbein's (1967) theory of propositional control suggests that attitudes or beliefs largely drive intentions to behave and subsequent behavior. The

present study follows the constructionist notion that, while individuals and their learning experiences influence and, to some degree are influenced by the context in which they work, their motivations to engage in knowledge sharing remain fundamentally autonomous and internally-driven intra-individual function (Fenwick, 2000). This conceptualization of knowledge construction in teams is consistent with Lave and Wenger's (1991) contextualization of situated learning; that is, learning that takes place within the same context as which it is applied begins with the people who are situated in the learning context. As members engage one another to solve shared problems and achieve joint tasks, these interactions set the stage for an activity system that joins the individual actor with other actors and with their shared context to jointly construct knowledge (Billett, 1996; Engström, 1987). Thus, following the theory of propositional control, the model proposed in Figure 1 articulates the process through which team members' attitudes and beliefs about knowledge and learning affect intentions to share knowledge and drive subsequent behaviors within the context of the team.

Personal theories of knowledge

Epistemological beliefs reflect one's attitudes about knowledge and learning (Schommer, 1990). Consistent with the theory of propositional control (Dulany, 1968; Fishbein, 1967), personal epistemologies guide one's beliefs, which, in turn, affect the cognitive processes underlying learning experiences and ultimately influence knowledge outcomes (Schommer, 1990). As such, they are considered cognitive behavioral dispositions, distinct from other intra-individual characteristics like personality or emotion (Nussbaum and Bendixen, 2003).

Epistemological beliefs are socially embedded (Hofer and Pintrich, 1997), although beliefs represent an individual's convictions, the socially embedded nature of epistemology ensures that they remain a dynamic, and thus trainable, construct (Nussbaum and Bendixen, 2003; Nist and Holschuh, 2005). For example, one's epistemological beliefs may be modified if the individual is exposed to new learning experiences that cause him or her to question existing assumptions. Individuals' attitudes and beliefs about knowledge influence their motivation and cognition such that they influence how the individuals approach tasks and the processes of learning and sharing knowledge (Hofer and Pintrich, 1997; Leppälä, 2012).

Belief dimensions and knowledge-sharing behaviors

The majority of contemporary studies on epistemological beliefs have followed Schommer's (1990) multidimensional approach, which suggests that each person's five separate belief dimensions develop at different rates and have unique effects on knowledge outcomes (Bauer *et al.*, 2004; Nist and Holschuh, 2005). Schommer's five epistemological belief dimensions each range on a continuum from sophisticated to naïve (or less sophisticated), and most studies conclude that positive knowledge outcomes will arise from individuals who hold mature or sophisticated beliefs, as opposed to those who hold less advanced beliefs. Sophisticated epistemological beliefs enable involvement in activities that are associated with experience-based learning (i.e. building on personal experience to effectively interact with others and participate in relevant knowledge-sharing activities) (Backström, 2004). This relationship is expected because cognitive learning has its roots in social interactions (Vygotsky, 1978; Cullen,

1999), and one's dispositional attributes, including their personal epistemologies, play an important role in the development of cognitive structures associated with acting on one's learning in everyday social interactions (Billett, 1996). Moreover, one's belief system plays an important part in learners' construction of their own experiences (Nist and Holschuh, 2005), thus further promoting experience-based learning (Gerber, 1998).

Previous research shows that epistemological beliefs influence the behavior process (Hofer and Pintrich, 1997; Schraw et al., 1995). Moreover, Whitmire (2003) found that epistemological beliefs affect the ways in which individuals seek and evaluate information as they work on specific problems. Although epistemological belief theory originated in education literature, Tickle et al. (2005) provided theoretical justification for the application of epistemological beliefs on the decision-making processes and behaviors of adult organization members, paving the way for further investigation. The following sections elaborate on how epistemological beliefs influence behavioral intentions and subsequent behavior by discussing the mechanisms through which sophisticated beliefs positively influence individual knowledge-sharing behaviors within a team.

Simplicity of knowledge. The first belief dimension exhibited in Figure 1 relates to one's belief in the simplicity of knowledge. According to Schommer (1990), an individual who views knowledge as simplistic would seek single answers to problems, and may oversimplify complex information. A belief that knowledge is simple exemplifies what Kofman and Senge (1993) term *fragmentary thinking*, which would impede one's ability to face systemic and complex challenges associated with team knowledge sharing. Members who believe that knowledge is complex are interested in the big picture, rather than being focused on less complicated individual pieces of information. An individual who believes in the complexity of knowledge would consider integrated knowledge as a valuable resource (Hobfoll, 1988), and would thus shape his or her work behaviors and goals toward conservation of this resource, taking such actions as sharing his or her own knowledge (knowledge donation), seeking out new information from others (knowledge collection) and incorporating those others' ideas into a collaborative framework, meeting Backström's (2004) criteria for integrating information as an important part of collective learning. As such, these individuals would engage in collaborative behavior that pulls ideas together through aggregation of knowledge (Knapp, 2010). Idea generation and intrapreneurship among team members enable innovation through a system of bottom-up knowledge sharing in which team members act as agents of knowledge creation (Hu and Randel, 2014; Nonaka, 1994). Such integration of knowledge will, according to Festinger's (1957) theory of cognitive dissonance, encourage associated, harmonious behaviors.

Further, these individuals would think creatively, unconstrained by orthodox or conventional limitations, and ultimately, see patterns in distributed knowledge that others may not see. In a team setting, this belief could manifest itself by motivating the team member to communicate with other members to arrive at a more complete comprehension. Rationale for such behavior in teams stems from Blau's (1964) social exchange theory, which would argue that a member would share his or her knowledge with the team because he or she expects reciprocity from fellow members. Bock and Kim (2002) build on Blau's theory to argue that a series of social interactions in which a member receives knowledge and reciprocates properly will lead to trust, and ultimately, establishment of positive exchange relations. Thus, acceptance that complex knowledge

arises from the proactive sharing of information among members will encourage information- and feedback-seeking behaviors, and arrive at greater knowledge-sharing success (Liu and Liu, 2011).

> P1. Team members' epistemological beliefs that knowledge is complex (rather than simple) will be positively related to their intention to share knowledge. This intention directly motivates subsequent knowledge-sharing behavior.

Innate ability to learn. The second dimension relates to one's belief about the degree to which knowledge can be gained through learning experiences. Within the workplace, people are regularly asked to carry out tasks that no one has the innate ability to perform. Thus, members must recognize the degree to which they and coworkers have the potential to gain task-related knowledge that will ultimately allow them to accomplish important tasks. Yet, some individuals believe that abilities are innate rather than acquired (Schommer, 1990). They accept that accomplishments tend to be made by innately talented individuals, and thus, believe that learning skills cannot be trained or taught to any significant degree. As teams are often called upon to accomplish work, recognition that learning experiences have the potential to drive knowledge is particularly important for members who rely on one another to jointly accomplish necessary tasks. The belief that knowledge can be gained through learning (as opposed to believing that knowledge is innate) deals with one's conviction in his or her own capacity to improve upon or gain (collect) knowledge, as well as his or her belief in others' abilities to do so. Consistent with self-determination theory, an individual who holds the belief that knowledge can be gained through learning experiences believes not in innate human abilities, but rather in human potentials (Ryan and Deci, 2000). Thus, this individual would be interested in exploring ways in which team interactions bring out the potential of each member. In a team context, this member will act as a knowledge broker, assisting fellow members to donate and collect the information they need.

The concept of learning goal orientation further explains why an individual who believes that knowledge can be gained through learning views knowledge attainment as an in-role behavior (O'Reilly and Chatman, 1986); that is, as behavior that is a required part of his or her job as a team member. An individual with a learning goal orientation would believe that successful task accomplishment comes from effort (VandeWalle *et al.*, 1999), and that his or her duty is to put in the effort associated with such outcomes. This echoes the sentiment, in knowledge-sharing research, that one's tendency to share knowledge with others "may be related to the degree of responsibility they feel for their jobs" (Liu and Liu, 2011). In the context of a team, a member who believes that knowledge can be gained through learning will approach team interactions as an opportunity to learn something, as he or she will recognize the usefulness of teamwork and collaboration exercises. Further, as this individual appreciates the mutually beneficial nature of social exchanges (Emerson, 1976), he or she would be willing to take the time to detail personally held knowledge to less knowledgeable teammates (donating knowledge), in addition to seeking feedback from other members (collecting knowledge) as discussed earlier. For these reasons:

> P2. Team members' epistemological beliefs that knowledge can be gained through learning (that it is not innate) will be positively related to their intention to share knowledge. This intention directly motivates subsequent knowledge-sharing behavior.

Omniscience of authority. The third dimension is related to the degree to which an individual externalizes knowledge. An individual with a sophisticated belief on this dimension internalizes the responsibility for knowledge, considering knowledge creation as something that happens from within him/herself, and not something that is passively done to him/her. Such thinking builds perceptions of self-efficacy and thus acts as a critical motivator of knowledge sharing (Liu and Liu, 2011). Thus, the belief that knowledge is generated from within should encourage an individual to examine his or her own influence on knowledge outcomes and recognize that such outcomes are, to some extent, dependent upon his or her own behavior. In a team setting, this behavior will manifest as the individual taking it upon him- or herself to assert, and thus share/ donate, acquired knowledge with teammates so as to improve team work processes and achieve team tasks. Learning and subsequent knowledge creation arise as a consequence of participation in this form of social practice (Billett, 2004). Opportunities for dialogue and inquiry constitute an important theme in conceptualizations of a learning organization (Cullen, 1999), and a belief in internalized knowledge will encourage an individual to engage in dialogue and inquire about topics when opportunities arise. This behavior sets the stage for a sophisticated form of learning that encompasses "the development of experience and knowledge by inquiry (or reflective thinking)" (Elkjaer, 2004, p. 419); such critical reflection produces a social process of adaptation that results in team learning (Knapp, 2010).

Further, an individual who believes in the internalization of knowledge creation will engage in information- and feedback-seeking discourse to encourage fellow members to take ownership of the team's knowledge generation. Sharing information with fellow teammates in this way helps to satisfy one's intrinsic motivation toward achievement (Yukl and Latham, 1978), and engaging in knowledge-sharing behaviors such as encouraging feedback improves image accuracy and self-enhancement (Scott and Lane, 2000).

Finally, drawing on Deci and Ryan's (1985) self-determination theory, knowledge-sharing behaviors could come about, in part, because of an individual's competence orientation. Members who believe in internalized responsibility for knowledge would boost their confidence in their own competency by retaining the large degree of control that is associated with taking on the role of information provider or broker. Thus:

> *P3.* Team members' epistemological beliefs to internalize (rather than externalize) knowledge will be positively related to their intention to share knowledge. This intention directly motivates subsequent knowledge-sharing behavior.

Certainty of knowledge. An individual who views knowledge as certain or fixed chooses to avoid ambiguity, preferring instead situations in which a predictable outcome is likely to ensue. Alternatively, an individual who believes that knowledge is uncertain or tentative is more inclined to openly explore alternatives and question the basis of any knowledge he or she acquires. The belief that knowledge is uncertain embodies what Kofman and Senge (1993) refer to as *transformational learning* – that is, change-oriented learning that rejects static notions of knowledge. This implies such knowledge-sharing behaviors as seeking out and listening to others' ideas (knowledge collection) and working to integrate them into a tentative understanding of the situation. Questioning assumptions results in higher levels of learning through a process that involves

modifying one's personal objectives and framing of knowledge upon critical reflection (Argyris and Schon, 1978; Wang and Ahmed, 2003), resulting in a "recombination of existing ideas that serve as a basis from which to create new knowledge" (Hu and Randel, 2014, p. 9). These individuals will also look for multiple solutions to problems and will challenge conventional wisdom (Nist and Holschuh, 2005); such dialogue-driven challenges are an important driver of organizational learning (Brown and Starkey, 2000). Although an individual who believes that knowledge is uncertain or tentative could understand a situation as potentially unresolvable (e.g. wondering whether, as knowledge is uncertain, they are taking the right course of action), this perspective actually benefits decision-making, as it represents the individual's low need for closure. De Dreu *et al.* (2008, p. 28) have argued that:

> […] individuals with low rather than high need for closure have a relatively weak desire for firm and ready-made knowledge, and thus they rely less on what other group members think to acquire (social) validation of one's views, beliefs, and perspectives.

One's low desire to reach a conclusive answer to a given topic allows him or her to react more positively to fellow members who disrupt closure by, for example, discussing alternative solutions or calling for a deeper consideration of the issue (Webster and Kruglanski, 1994). Teams composed of members with low need for closure tend to report less pressures for conformity and higher levels of open, unrestricted communication (De Grada *et al.*, 1999).

Individuals who believe that knowledge is uncertain tend to approach knowledge from a situationist perspective (Davis-Blake and Pfeffer, 1989), recognizing that situationally based, contextual differences contribute to knowledge. As such, a team member with this belief would be more open to exploring alternative explanations and interested in learning how other members acquired their knowledge (knowledge collection), particularly when the other member's knowledge differs from his or her own. Further, a member who believes that knowledge is uncertain or tentative will perceive ambiguous situations or stimuli as challenging, interesting and even desirable (Furnham and Ribchester, 1995) and is more likely to engage in conversation in which he or she openly considers alternatives brought to the table by fellow members. These behaviors are consistent with knowledge sharing.

P4. Team members' epistemological beliefs that knowledge is uncertain or tentative (rather than certain or fixed) will be positively related to their intention to share knowledge. This intention directly motivates subsequent knowledge-sharing behavior.

Speed of learning. Finally, one's belief regarding whether knowledge acquisition is a continual process (rather than a now-or-never endeavor) can influence the ways in which someone who believes knowledge is a continual process behaves in a team setting. Consistent with Vroom's (1964) expectancy theory and Cabrera and Cabrera's (2002) contention that the decision to share knowledge entails a cost-benefit analysis, an individual who believes that knowledge is a continual process and that there is constantly more that can be learned would view continued time spent collaborating as potentially leading to the desired outcome of acquiring more knowledge. Likewise, from the perspective of knowledge donation, these theories would argue that an individual's willingness to share his or her knowledge with others is determined by his or her

expectation of the outcome (Liu and Liu, 2011). To this individual, the journey of learning from one another, and from trial-and-error, allows for important information gains, which the member translates into task-related knowledge. The networking aspect of continually working toward a task appeals to these members, as they perceive more opportunities to be informed by others, thereby further developing their own knowledge, skills and abilities. These collaborative exercises will provide more opportunity to explore alternatives and engage in a system of task-related transactions with fellow teammates, furthering individual competence by allowing them to acquire additional knowledge and skills. Thus, team members who believe that knowledge creation is a continual process will be motivated to engage in knowledge-sharing behaviors. Further, an assumption of time constraint is considered to be one of the largest obstacles affecting workers' decision to participate in knowledge-sharing activity (Eraut, 2004; Hu and Randel, 2014). On the other hand, for team members who view knowledge as something that develops over time, the extensive personal contact and trust that develop as they work with their teammates over multiple occasions and across time will increase the effectiveness of knowledge transfer within that team (Hu and Randel, 2014). Hence:

> *P5.* Team members' epistemological beliefs that knowledge creation is a continual process (rather than now-or-never) will be positively related to their intention to share knowledge. This intention directly motivates subsequent knowledge-sharing behavior.

Results
This research presents a model that demonstrates how sophisticated (as opposed to naive) beliefs on each of five epistemological belief dimensions can stimulate one's intrinsic intentions to engage in knowledge-sharing behaviors. These concepts follow a stream of extant research that emphasizes the central role that individual team members play in collective knowledge outcomes by focusing on the intra-individual processing of knowledge. The model adds to our understanding of intrinsic motivators of knowledge sharing among team members, and provides a mechanism through which an organization can capitalize on the knowledge residing within its workforce.

Implications and limitations of the proposed model
The proposed model is useful toward organizing knowledge management processes, to better understand (in)effectiveness in teams and to identify team members best suited for knowledge-intensive positions. However, as discussed below, the model is constrained by the assumptions that learning takes place socially and within a specific context (in this case, the team setting), and that a great deal of knowledge sharing is preferable. Future research investigating these constraints and empirically examining the theoretical relationships proposed in the proposed model will help to better inform training and managerial decision-making relevant to knowledge sharing in work teams.

Boundary conditions
One constraint of the model is the assumption that sophisticated beliefs are always preferred over more naïve beliefs, or that they are expected to lead to the best outcomes. It is worthwhile to consider Hammer and Elby's (2002) alternative view that different ranges of beliefs along the mature – naïve continuum may be appropriate in different contexts. A further constraint upon the model involves the assumptions that underlie

much of the theoretical reasoning behind the proposed relationships. First, the assumption that learning takes place socially and in a specific context bounds the rationality behind the proposed model. Second, the model is bound by an underlying assumption common to most knowledge-sharing literature that a great deal of knowledge sharing is more favorable than little knowledge sharing. Third, building on the knowledge-based perspective of the firm, this paper takes the view that organizations and team members view knowledge as an important organizational resource. Thus, an additional potential boundary condition applies to the organization's perspective – that is, the model may be more salient in an organization where decision-makers and team members are actively focused on reaping the benefits associated with learning and knowledge sharing. However, this boundary condition emphasizes the timeliness of this manuscript: although it is inevitable that members of the post-World War II baby boom demographic will soon retire, current economic conditions have forced many of these older workers to remain with their current organizations. Thus, organizations have the opportunity to focus on improving knowledge sharing before they forever lose the vast knowledge held by these experienced workers.

Epistemological beliefs at work
Presently, although a small handful of scales are designed to capture epistemological beliefs (Schommer, 1990; Schraw *et al.*, 1995), these scales were designed to be completed by individuals engaged in a classroom-style setting, and thus do not capture the varying ranges of perspectives or complexities of knowledge and learning opportunities prevalent in the workplace. Thus, before the proposed relationships can be empirically validated in an organizational setting, researchers face the challenges associated with ensuring that the current measures of epistemological beliefs are appropriate to workplace contexts. Two specific challenges may exist. The broadest challenge lies in determining whether working adults identify a different set of beliefs than students. Although this article explores ways in which known dimensions of epistemologies impact the behaviors of organizational workers, future research is needed to verify whether these dimensions accurately reflect the beliefs of organizational team members. Future research is needed to empirically validate the dimensionality of epistemological beliefs within a sample of working adults and to subsequently develop and test hypotheses related to the extant or emergent epistemological belief dimensions. Further, investigating questions regarding the ways in which group dynamics interact with team member epistemologies would be worthwhile, for instance, questioning the relative number of team members with sophisticated belief systems required for team knowledge sharing to adequately take place, or, alternatively, what role the team leader's sophistication level plays in enhancing team knowledge sharing.

Second, disagreement exists as to whether an individual's epistemological beliefs are universal (context-free) or context-specific (Pajares, 1992). Therefore, researchers interested in testing the relationship between epistemological beliefs and knowledge sharing (and in developing and/or validating existing measurement instruments to do so) should consider whether they expect an employee's general beliefs about knowledge and learning to universally affect his or her knowledge-sharing behaviors or whether they anticipate that each individual's beliefs toward knowledge and learning are contextually dynamic.

Contributions to theory, practice and society
The proposed model offers a number of advances to our understanding of knowledge-sharing processes in team settings. It also establishes a possible new intra-individual antecedent to explain how team members are internally motivated to engage in knowledge-sharing behaviors. Sophisticated beliefs about knowledge and learning may have a powerful, positive association with knowledge sharing in organizational teams. As an individual's beliefs can become more comprehensive and sophisticated over time through specialized training and increased interactions with individuals who hold sophisticated beliefs (Nist and Holschuh, 2005), managers have an opportunity to take proactive measures to advance team members' beliefs and thereby enhance incidences of knowledge sharing. Thus, organizations might consider strategically training team knowledge workers to increase the sophistication of thought regarding knowledge and learning.

Building on Bock *et al.*'s (2005) model of behavioral intention formation, it is worth investigating the degree to which epistemological belief sophistication arises from training employees to make a connection between knowledge sharing and self-worth, and to recognize the value of reciprocity of knowledge sharing. Such training could focus on increasing individual incentives to share knowledge "either by increasing the perceived benefits of contributing or by increasing (team member) beliefs in contributing" (Liu and Liu, 2011, p. 982). Investigations into training programs would benefit by following the suggestions of Valanides and Angeli (2005) whose study suggests that a combination of critical thinking instruction and a process of evaluation, reflection and debate over the learning process can significantly affect the beliefs held by individual learners. Reflection enables meaning-making, interpretation and the formation of mental structures, and adaptation or transformation of these mental structures; accordingly, reflection entails a social-constructivist perspective of knowledge that emphasizes the individual as a central actor with regard to organizational knowledge sharing (Fenwick, 2000).

Similarly, the proposed framework provides guidance for managers to understand ineffectiveness in teams and to identify individuals likely to engage in knowledge-sharing behaviors at work. An understanding of the cognitive mechanisms associated with epistemological beliefs enables managers to make a more educated speculation as to why a certain team may be underperforming. Thus, epistemological beliefs could be used as a diagnostic tool to address issues of team members not behaving as productively as expected or who are experiencing negative effects from the team work process.

The ideas presented in the proposed model also have implications for society. Specifically, the study of epistemological beliefs and subsequent team work behaviors informs us about how "epistemology and a willingness to learn affect collaborative relationships and outcomes", a need touted widely by engineering scholars (Borrego and Newswander, 2008, p. 124; Vanasupa *et al.*, 2009). With regard to engineers and others tasked with designing and implementing products for public use, this understanding may have a particularly important effect on society, given that any product could hold potential inherent dangers to public health and safety (Vanasupa *et al.*, 2009). More generally, by considering the relationship between one's epistemologies and subsequent team work behaviors, the model broadens our scope of understanding about how individuals' contributions and reactions affect achievement outcomes, and presents an opportunity for scholars and practitioners to examine how teams generate knowledge

outcomes grounded in and representative of individual team member contributions. This individualized approach to team learning and knowledge sharing has been associated with gaining employee support and with benefits to multiple organizational stakeholders (Kotler and Lee, 2008).

Conclusion
This research offers a unique outlook on the way in which member epistemological beliefs fundamentally affect the degree of knowledge sharing that takes place in the context of a work team. The theory posited herein offers a preliminary indication that organizations may be able to gain insight into the intra-individual cognitive processes through which knowledge sharing comes about at work. Specifically, the model suggests the importance of team member epistemological sophistication toward team knowledge-sharing outcomes. As epistemological belief systems have been shown to be flexible and gained through learning experiences, organizations retain the power to train their team-based knowledge workers in a way that prompts greater knowledge sharing and ultimately better team outcomes. Moreover, by offering a new model and a number of testable predictions, this research aims to prompt an expansion of research on individual contributions to stimulate a learning organization. As knowledge sharing cannot be forced, and should, rather, be intrinsically encouraged and facilitated (Hu and Randel, 2014; Liu and Liu, 2011), the hope is that the ideas presented and organized in the proposed framework will stimulate further research and discussion about the value of individual contributions to knowledge outcomes toward achievement of higher-level organizational objectives.

References

Ajzen, I. and Fishbein, M. (1970), "The prediction of behavior from attitudinal and normative variables", *Journal of Experimental Social Psychology*, Vol. 6 No. 4, pp. 466-487.

Argyris, C. and Schon, D. (1978), *Organizational Learning: A Theory of Action Approach*, Addision Wesley, Reading, MA.

Backström, T. (2004), "Collective learning: a way over the ridge to a new organizational attractor", *The Learning Organization*, Vol. 11 No. 6, pp. 466-477.

Bauer, J., Festner, D., Gruber, H., Harteis, C. and Heid, H. (2004), "The effects of epistemological beliefs on workplace learning", *The Journal of Workplace Learning*, Vol. 16 No. 5, pp. 284-292.

Barrick, M.R., Stewart, G.L., Neubert, J.M. and Mount, M.K. (1998), "Relating member ability and personality to work team processes and team effectiveness", *Journal of Applied Psychology*, Vol. 83 No. 3, pp. 377-391.

Billett, S. (1996), "Situated learning: bridging sociocultural and cognitive theorizing", *Learning and Instruction*, Vol. 6 No. 3, pp. 263-280.

Billett, S. (2004), "Workplace participatory practices", *Journal of Workplace Learning*, Vol. 16 No. 6, pp. 312-324.

Blau, P. (1964), *Exchange and Power in Social Life*, Wiley, New York, NY.

Bock, G.W. and Kim, Y.-G. (2002), "Breaking the myths of rewards: an exploratory study of attitudes about knowledge sharing", *Information Resources Management Journal*, Vol. 15 No. 2, pp. 14-21.

Bock, G.W., Zmud, R.W., Kim, Y.-G. and Lee, J.N. (2005), "Behavioral intention formation in knowledge sharing: examining the roles of extrinsic motivators, social-psychological forces, and organizational climate", *MIS Quarterly*, Vol. 29 No. 1, pp. 87-111.

Borrego, M. and Newswander, L.K. (2008), "Characteristics of successful cross-disciplinary engineering education collaborations", *Journal of Engineering Education*, Vol. 97 No. 2, pp. 123-134.

Browaeys, M.-J. and Fisser, S. (2012), "Lean and agile: an epistemological reflection", *The Learning Organization*, Vol. 19 No. 3, pp. 207-218.

Brown, A.D. and Starkey, K. (2000), "Organizational identity and learning: a psychodynamic perspective", *Academy of Management Review*, Vol. 25 No. 1, pp. 102-120.

Cabrera, A. and Cabrera, E.F. (2002), "Knowledge-sharing dilemmas", *Organizational Studies*, Vol. 23 No. 5, pp. 687-710.

Connelly, C.E. and Kelloway, E.K. (2003), "Predictors of employees' perceptions of knowledge sharing cultures", *Leadership & Organization Development Journal*, Vol. 24 No. 5, pp. 294-301.

Cullen, J. (1999), "Socially constructed learning: a commentary on the concept of the learning organization", *The Learning Organization*, Vol. 6 No. 1, pp. 45-52.

Davis-Blake, A. and Pfeffer, J. (1989), "Just a mirage: the search for dispositional effects in organizational research", *Academy of Management Review*, Vol. 14 No. 3, pp. 385-400.

De Dreu, C.K.W., Nijstad, B.A. and van Knippenberg, D. (2008), "Motivated information processing in group judgment and decision making", *Personality and Social Psychology Review*, Vol. 12 No. 1, pp. 22-49.

De Grada, E., Kruglanski, A.W., Mannetti, L. and Pierro, A. (1999), "Motivated cognition and group interaction: need for closure affects the contents and processes of collective negotiations", *Journal of Experimental Social Psychology*, Vol. 35 No. 4, pp. 346-365.

de Vries, R.E., van den Hooff, B. and de Ridder, J.A. (2006), "Explaining knowledge sharing: the role of team communication styles, job satisfaction, and performance beliefs", *Communication Research*, Vol. 33 No. 2, pp. 115-135.

Deci, E.L. and Ryan, R.M. (1985), *Intrinsic Motivation and Self-Determination in Human Behavior*, Plenum Press, New York, NY.

Dixon, N.M. (1992), "Organizational learning: a review of the literature with implications for HRD professionals", *Human Resource Development Quarterly*, Vol. 3 No. 1, pp. 29-49.

Dulany, D.E. (1968), "Awareness, rules, and prepositional control: a confrontation with S-R behavior theory", in Dixon, T.R. and Horton, D.L (Eds), *Verbal Communication and General Behavior Theory*, Prentice-Hall, Englewood Cliffs, NJ, pp. 340-387.

Elkjaer, B. (2004), "Organizational learning the 'third way'", *Management Learning*, Vol. 35 No. 4, pp. 419-434.

Emerson, R.M. (1976), "Social exchange theory", *Annual Review of Psychology*, Vol. 2 No. 1, pp. 335-362.

Engström, T.E.J. (2003), "Sharing knowledge through mentoring", *Performance Improvement*, Vol. 42, pp. 36-42.

Engström, Y. (1987), *Learning by Expanding: An Activity-theoretical Approach to Developmental Research*, Orienta-Konsultit, Helsinki.

Eraut, M. (2004), "Informal learning in the workplace", *Studies in Continuing Education*, Vol. 26 No. 2, pp. 247-273.

Fenwick, T.J. (2000), "Expanding conceptions of experiential learning: a review of the five contemporary perspectives on cognition", *Adult Education Quarterly*, Vol. 50 No. 4, pp. 243-272.

Festinger, L. (1957), *A Theory of Cognitive Dissonance*, Stanford University Press, Stanford, CA.

Fishbein, M. (1967), "Attitude and prediction of behavior", in Fishbein, M. (Ed.), *Readings in Attitude Theory and Measurement*, Wiley, New York, NY.

Furnham, A. and Ribchester, T. (1995), "Tolerance of ambiguity: a review of the concept, its measurement and applications", *Current Psychology*, Vol. 14 No. 3, pp. 179-199.

Gerber, R. (1998), "How do workers learn in their work?", *The Learning Organization*, Vol. 5 No. 4, pp. 168-175.

Grant, R.M. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17 No. S2, pp. 109-122.

Guzzo, R.A. and Dickson, M.W. (1996), "Teams in organizations: recent research on performance and effectiveness", *Annual Review of Psychology*, Vol. 47 No. 1, pp. 307-338.

Halawi, L.A., McCarthy, R.V. and Aronson, J.E. (2006), "Knowledge management and the competitive strategy of the firm", *The Learning Organization*, Vol. 13 No. 4, pp. 384-397.

Hammer, D. and Elby, A. (2002), "On the form of a personal epistemology", in Hofer, B.K. and Pintrich, P.R. (Eds), *Personal Epistemology: The Psychology of Beliefs about Knowledge and Knowing*, Erlbaum, Mahwah, NJ, pp. 171-192.

Hobfoll, S.E. (1988), *The Ecology of Stress*, Hemisphere, Washington, DC.

Hofer, B.K. and Pintrich, P.R. (1997), "The development of epistemological theories: beliefs about knowledge and knowing and their relation to learning", *Review of Educational Research*, Vol. 67 No. 1, pp. 88-140.

Hollan, J., Hutchins, E. and Kirsh, D. (2000), "Distributed cognition: toward a new foundation for human-computer interaction research", *ACM Transactions on Computer-Human Interaction (TOCHI)*, Vol. 7 No. 2, pp. 174-196.

Horner, M. (1997), "Leadership theory: past, present and future", *Team Performance Management*, Vol. 3 No. 4, pp. 270-287.

Hu, L. and Randel, A.E. (2014), "Knowledge sharing in teams: social capital, extrinsic incentives, and team innovation", *Group & Organization Management*, Vol. 39, pp. 213-243, Doi: 10.1177/1059601114520969

Jakubik, M. (2008), "Experiencing collaborative knowledge creation processes", *The Learning Organization*, Vol. 15 No. 1, pp. 5-25.

Katz, N., Lazer, D., Arrow, H. and Contractor, N. (2004), "Network theory and small groups", *Small Group Research*, Vol. 35 No. 3, pp. 307-332.

Khedhaouria, A. and Ribiere, V. (2013), "The influence of team knowledge sourcing on team creativity: evidences from information system development", *The Learning Organization*, Vol. 20 Nos 4/5, pp. 308-321.

Knapp, R. (2010), "Collective (team) learning process models: a conceptual review", *Human Resource Development Review*, Vol. 9 No. 3, pp. 285-299.

Kofman, F. and Senge, P.M. (1993), "Communities of commitment: the heart of learning organizations", *Organizational Dynamics*, Vol. 22 No. 2, pp. 5-23.

Kotler, P. and Lee, N. (2008), *Corporate Social Responsibility: Doing the Most Good for Your Company and Your Cause*, John Wiley & Sons, Hoboken, NJ.

Lave, J. and Wenger, E. (1991), *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press, Cambridge.

Leppälä, S. (2012), "An epistemological perspective on knowledge transfers: from tacitness to capability and reliability", *Industry and Innovation*, Vol. 19 No. 8, pp. 631-647.

Liu, N.C. and Liu, M.S. (2011), "Human resource practices and individual knowledge-sharing behavior – an empirical study for Taiwanese R&D professionals", *The International Journal of Human Resource Management*, Vol. 22 No. 4, pp. 981-997.

Mathieu, J., Maynard, M.T., Rapp, T. and Gilson, L. (2008), "Team effectiveness 1997-2007: a review of recent advancements and a glimpse into the future", *Journal of Management*, Vol. 34 No. 3, pp. 410-476.

Mitchell, R., Nicholas, S. and Boyle, B. (2009), "The role of openness to cognitive diversity and group processes in knowledge creation", *Small Group Research*, Vol. 40 No. 5, pp. 535-554.

Nahapiet, J. and Ghoshal, S. (1998), "Social capital, intellectual capital, and the organizational advantage", *Academy of Management Review*, Vol. 23 No. 2, pp. 242-266.

Nist, S.L. and Holschuh, J.P. (2005), "Practical applications of the research on epistemological beliefs", *Journal of College Reading and Learning*, Vol. 35 No. 2, pp. 84-92.

Nonaka, I. (1991), "The knowledge-creating company", *Harvard Business Review*, Vol. 69 No. 6, pp. 96-104.

Nonaka, I. (1994), "A dynamic theory of organizational knowledge creation", *Organization Science*, Vol. 5 No. 1, pp. 14-37.

Nussbaum, E.I. and Bendixen, L.D. (2003), "Approaching and avoiding arguments: the role of epistemological beliefs, need for cognition, and extraverted personality traits", *Contemporary Educational Psychology*, Vol. 28 No. 4, pp. 573-595.

Okhuysen, G.A. and Eisenhardt, K.M. (2002), "Integrating knowledge in groups: how formal interventions enable flexibility", *Organization Science*, Vol. 13 No. 4, pp. 370-386.

O'Reilly, C. III and Chatman, J.A. (1986), "Organizational commitment and psychological attachment: the effects of compliance, identification, and internalization on prosocial behavior", *Journal of Applied Psychology*, Vol. 71 No. 3, pp. 492-499.

Örtenblad, A. (2001), "On differences between organizational learning and learning organization", *The Learning Organization*, Vol. 8 No. 3, pp. 125-133.

Pajares, M.F. (1992), "Teachers' beliefs and educational research: cleaning up a messy construct", *Review of Educational Research*, Vol. 62 No. 3, pp. 307-332.

Pemberton, J.D. and Stonehouse, G.H. (2000), "Organisational learning and knowledge assets – an essential partnership", *The Learning Organization*, Vol. 7 No. 4, pp. 184-194.

Pintrich, P.R., Marx, R.W. and Boyle, R.A. (1993), "Beyond cold conceptual change: the role of motivational beliefs and classroom contextual factors in the process of conceptual change", *Review of Educational Research*, Vol. 63 No. 2, pp. 167-199.

Ryan, R.M. and Deci, E.L. (2000), "Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being", *American Psychologist*, Vol. 55 No. 1, pp. 68-78.

Schommer, M. (1990), "Effects of beliefs about the nature of knowledge on comprehension", *Journal of Educational Psychology*, Vol. 82 No. 3, pp. 498-504.

Schraw, G., Dunkle, M.E. and Bendixen, L.D. (1995), "Cognitive processes in well-defined and ill-defined problem solving", *Applied Cognitive Psychology*, Vol. 9 No. 6, pp. 523-538.

Scott, S.G. and Lane, V.R. (2000), "A stakeholder approach to organizational identity", *The Academy of Management Review*, Vol. 25 No. 1, pp. 43-62.

Staples, D.S. and Webster, J. (2008), "Exploring the effects of trust, task interdependence and virtualness on knowledge sharing in teams", *Information Systems Journal*, Vol. 18 No. 6, pp. 617-640.

Stewart, G.L. (2006), "A meta-analytic review of relationships between team design features and team performance", *Journal of Management*, Vol. 32 No. 1, pp. 29-54.

Tickle, E.L., Brownlee, J. and Nailon, D. (2005), "Personal epistemological beliefs and transformational leadership behaviours", *Journal of Management Development*, Vol. 24 No. 8, pp. 706-719.

Tillema, H.H. (2006), "Authenticity in knowledge-productive learning: what drives knowledge construction in collaborative inquiry?", *Human Resource Development International*, Vol. 9 No. 2, pp. 173-190.

Tsai, W. (2001), "Knowledge transfer in intraorganizational networks: effects of network position and absorptive capacity on business unit innovation and performance", *Academy of Management Journal*, Vol. 44 No. 5, pp. 996-1004.

Valanides, N. and Angeli, C. (2005), "Effects of instruction on changes in epistemological beliefs", *Contemporary Educational Psychology*, Vol. 30 No. 3, pp. 314-330.

Vanasupa, L., Stolk, J. and Herter, R.J. (2009), "The four-domain development diagram: a guide for holistic design of effective learning experiences for the twenty-first century engineer", *Journal of Engineering Education*, Vol. 98, pp. 67-81.

VandeWalle, D., Brown, S.P., Cron, W.L. and Slocum, J.W. (1999), "The influence of goal orientation and self-regulation tactics on sales performance: a longitudinal field test", *Journal of Applied Psychology*, Vol. 84 No. 2, pp. 249-259.

van Emmerik, I.J.H. and Brenninkmeijer, V. (2009), "Deep-level similarity and group social capital: associations with team functioning", *Small Group Research*, Vol. 40 No. 6, pp. 650-669.

Vroom, V.H. (1964), *Work and Motivation*. Wiley, New York, NY.

Vygotsky, L. (1978), *Mind in Society: The Development of Higher Psychological Processes*, Harvard University Press, Cambridge, MA.

Wang, C.L. and Ahmed, P.K. (2003), "Organisational learning: a critical review", *The Learning Organization*, Vol. 10 No. 1, pp. 8-17.

Webster, D.M. and Kruglanski, A.W. (1994), "Individual differences in need for cognitive closure", *Journal of Personality and Social Psychology*, Vol. 67 No. 6, pp. 1049-1062.

Weinberg, F.J., Mulki, J.P. and Lankau, M.J. (2015), "The impact of effort-oriented epistemological beliefs on mentoring support", *The Journal of Workplace Learning*, Doi: 10.1108/JWL-12-2013-0111

Whitmire, E. (2003), "Epistemological beliefs and the information-seeking behavior of undergraduates", *Library & Information Science Research*, Vol. 25 No. 2, pp. 127-142.

Yukl, G.A. and Latham, G.P. (1978), "Interrelationships among employee participation, individual differences, goal difficulty, goal acceptance, goal instrumentality, and performance", *Personnel Psychology*, Vol. 31 No. 2, pp. 305-323.

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