Knowledge Sharing is Knowledge Creation: An Action Research Study of Metaphors for Knowledge

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Knowledge sharing and knowledge transfer are important concepts in knowledge communication research and practice. However, when groups of knowledge workers engage in knowledge communication activities, they easily turn into mere mechanical information processing despite other ambitions. This article relates literature of knowledge communication and knowledge creation to an action research study in a large Danish food production company. The group was observed and underwent a metaphor analysis as well as an analysis of co-creation strategies. Confronted with the results, the group completely altered their approach to knowledge sharing and let it become knowledge co-creation. The conclusions are that knowledge is and can only be a diverse and differentiated concept and that groups are able to embrace this complexity even if theory suggests otherwise. Thus, rather than reducing complexity and dividing knowledge into to dichotomies or hierarchies, knowledge workers should be enabled to use different strategies of knowledge sharing, transfer and creation depending on the task and the nature of the knowledge. However, if the ambition is to have a strategy for sharing personal or tacit knowledge the recommended approach is to co-create new knowledge by use of joint epistemic action.

Keywords: Knowledge sharing; metaphors; epistemic action; knowledge creation

1. INTRODUCTION

A group of highly educated consultants in a department working with change processes in a large Danish food production company continuously expressed a wish to become better at sharing knowledge. Despite different actions to meet the need, the wish was expressed year after year indicating that the actions did not quite meet the requests.

Living in a knowledge society understanding the concept of knowledge is essential (Lyotard, 1996; Qvortrup, 2006). However, understanding concepts of knowledge within a group is not a trivial task. Knowledge communication can be defined as a third order discipline (Kastberg, 2014) not having one common denominator but consisting of a framework of theories held together by a shared focus on communicating knowledge. Comprehending the concept of knowledge within groups requires both understanding of metaphors in conversations, knowledge theory and joint epistemic action and distributed cognition. In this article these perspectives are conflated. The analysis shows how knowledge was metaphorically conceptualized in a group of change management consultants. Then they were confronted with the results and theoretical framework and chose to adopt a new practice of knowledge sharing. The questions asked in this article are thus: 1) How is "knowledge" conceptualized by the group of knowledge workers, and 2) which strategies for knowledge sharing do the revealed concepts of knowledge require?

This article consists of three elements: 1) A theoretical framing of knowledge, metaphoricity and joint epistemic action as a foundation for the following analysis; 2) A description of the action research study and an analysis of the concepts of knowledge present in the study; 3) Perspectives drawn from the study and what they did after the first intervention – leading to the conclusion that the diversity of knowledge calls for diversity in sharing strategies.

2. THEORETICAL FRAMEWORK: METAPHORS, KNOWLEDGE AND EPISTEMIC ACTION

As mentioned above, three elements are conflated into a theoretical framework: knowledge theory, metaphorical conceptualization, and joint epistemic action. These three elements are chosen to embrace the relevant elements in understanding metaphors for knowledge in groups. This conflation is novel and potentially controversial as it draws on long traditions in all three fields with regards to choice of methods and disciplinary backgrounds. However, letting the three approaches function as a triangulation of how knowledge concepts emerge provides more information and more insight into process, language and concept than either could have provided without the other. Hence, looking at metaphors for knowledge alone would not provide an understanding of how the concepts are created by the group – if it is a process directed by an individual or a shared approach.

The theories below are all founded in the emerging tradition of 4E cognition which regards human cognition as embodied, embedded, enacted and extended (Menary, 2010). In order to understand knowledge in the contemporary society it is essential to understand the current paradigm in relation to prior paradigms. Referring to Kuhn Varela, Thomson and Rosch (1991) describe the mutation into a new paradigm like this:

At this time science not only recognizes that the investigation of knowledge itself is legitimate but also conceives knowledge in a broad, interdisciplinary perspective, well beyond the traditional confines of epistemology and psychology. (Varela et al., 1991: 5)

It is in this broad and interdisciplinary perspective that knowledge is investigated in the following. Understanding how knowledge as a concept is perceived and used is only possible through an understanding of how it is embodied, and this is best investigated by use of a conversation analysis and an analysis of the approach to joint epistemic action.

2.1. Knowledge in Theory

In the analysis below, the concept of knowledge is approached and understood in a conversational setting. Thus, the participants might not take theoretical assumptions about knowledge into consideration. However, regarding knowledge in theory is also very relevant in order to be able to compare the theoretical and the empirical findings. There are three generations of knowledge understandings in the tradition of knowledge management (Kastberg, 2014: 88).

According to Kastberg, the first generation would have Nonaka and colleagues as prime examples (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka & von Krogh, 2009). Here the important contribution is the differentiation between tacit and explicit knowledge. Nonaka argues that knowledge creation happens in a process of making tacit knowledge explicit, and he even argues that the use of metaphors and analogies is an effective way of doing so. This approach to knowledge thus links together the trajectory of metaphoricity and knowledge, which will be elaborated below. From this first generation knowledge management it is important to bring along this notion of tacit knowledge being shareable through metaphors.

The second generation of knowledge in management is represented in e.g. Davenport and Prusak and their knowledge hierarchies (Davenport & Prusak, 1998). The hierarchies as they have been restructured and altered can be further explored in the review made by Rowley (2007). The essential element of the knowledge hierarchy theory is that knowledge consists of three to four levels building on each other. The levels are: data, information, knowledge (and wisdom). Thus, data + structure = information, information + experience = knowledge, and knowledge + foresight = wisdom. In this understanding of knowledge, it is evident that the more complexity added, the higher the position in the hierarchy.

The two approaches in generations 1 and 2 have been analyzed from a metaphor perspective by Andriessen (2006). He finds that two very different metaphorical concepts are at play with regards to knowledge in the theories by Nonaka and Takeuchi on the one hand and Prusak and Davenport on the other. His analysis shows that in the case of Nonaka and Takeuchi knowledge is a personal asset. It is tacit and personal and thus linked to experience. In the case of Prusak and Davenport, knowledge is an object and is explicit. This leads Andriessen to suggest that knowledge is conceptualized either as "stuff or love" (Andriessen, 2008). This dichotomy will be further elaborated below.

According to Kastberg (2014), the third generation of knowledge is emerging and still developing. The headline is to empower the employee as knower. However, as stated by Qvortrup (2006), the dichotomy between knowledge as an object and as a personal asset is still relevant: "While politicians often seem to be in favour of easily measurable factual knowledge, industrialists and employers seem to prefer problem–solving competencies" (ibid 2006: 9). Qvortrup goes on to suggest four orders of knowledge: Factual knowledge (know–what, 1st order), competence (know–how, 2nd order), creative knowledge (using knowledge to change, 3rd order) and cultural knowledge (knowledge of context, 4th order). Not positioning the four orders in a hierarchy Qvortrup dissolves the dichotomy and hierarchical thinking in the previous generations and embraces what also seems to be present in the case of this article: that knowledge is a differentiated phenomenon holding many connotations. As implied by the quote from Varela et al. above, knowledge is mutating. The three generations are all part of the same mutation. Thus, they are not paradigmatically different; they rather represent a development and a direction in understanding knowledge as complex and multifaceted. The concept of knowledge expected in the group of knowledge workers is a diverse and multi–facetted and shared concept. Further, the expectation would be that metaphors would play a role in making the tacit understanding explicit.

2.2. Metaphorical Conceptualization

The terms metaphors and metaphoricity are used when conceptualizing abstract phenomena (Lakoff & Johnson, 1980). Thus, in understanding knowledge as a concept metaphors should be investigated.

Metaphor analysis in the setting of this study is situated in the tradition from Lakoff and Johnson (Lakoff & Johnson, 1999) in regarding metaphors as embodied realism. However, the Conceptual Metaphor Theory (CMT) has been abandoned in favor of a more bottom–up approach to the analysis of metaphors in conversations (Krennmayr, 2013). CMT is descriptive in nature and regards metaphors in language as a sign of metaphors in thought. This has been discussed at length ever since, but proceeding into that discussion is beyond the focus of this article (Jensen & Cuffari, 2014; Steen, 2008). The approach to metaphors and metaphoricity in the context of this article is based on the discourse dynamics approach (Cameron et al., 2009). That means that the analysis is led by metaphor. Cameron et al. explains this:

… it [metaphor analysis] is no longer a static, fixed mapping, but a temporary stability emerging from the activity of interconnecting systems of socially-situated language use and cognitive activity. (Cameron et al., 2009:64)

What we find when analyzing metaphors for knowledge is not a picture of how knowledge is conceptualized at all times by this group. Rather, it shows how they understand the concept of knowledge at this point in time. The idea of a static mapping between source and target domain has been abandoned (the A=B form of metaphor, e.g. "Love is Warmth", love being the abstract phenomenon to be explained and warmth being in what terms love is understood, leading to expressions like "She had a warm smile" or "He gave me a could shoulder"). Instead, the analysis of metaphors in conversations is the analysis of what emerges at this point in time. This in turn does not make the findings irrelevant or unreliable, but it emphasizes that metaphors used in social interaction might just as well be a negotiation of the concept as an expression of an already existing mapping.

The metaphoricity is determined on the basis of doubleness in meaning and the level of co-creation (Jensen & Cuffari, 2014) rather than on the basis of a linguistic language analysis (Pragglejaz Group, 2007; Steen, 2010, 2011). As the focus in the method of analysis is on how the metaphoricity emerges as well as on which metaphors occur the strict linguistic analysis will not provide enough room for understanding the emergence. As put by Cornelissen (2005: 751), metaphor and metaphoricity in this sense are "… the generation and creation of new meaning beyond a previously existing similarity."

Besides letting the group talk about knowledge and thus use metaphors for knowledge, the group was given a complimentary mode to perform joint epistemic action. This addition provides insight into how and whether or not the group co-creates a metaphorical concept for knowledge.

2.2. Epistemic Action

The last part of the theoretical framework of this article is epistemic action. Epistemic action happens when we use our environment to make more efficient what we could just as well have done by thought alone. Clark and Chalmers refer to this approach to cognition as extended mind (1998) and thus as one of the four E's in 4E cognition. This approach is also used in studies with focus on strategy development (Heracleous & Jacobs, 2008) and in developing a taxonomy for joint epistemic action (Bjørndahl, Fusaroli, Østergaard, & Tylén, 2014). The latter study provides three approaches to analyzing the joint epistemic action of a group. The taxonomy they provide is used in the below analysis. When a group is given the task to build something abstract together by use of toy bricks, they are actually conceptualizing by using a shared mode and thus make use of extended mind and distributed cognition (Hutchins, 1995). The taxonomy presented by Bjørndahl et al. divides the approach to building with toy bricks into three: 1. Illustration: a top-down process where one member of the group presents the overall concept and builds it alone or together with the rest of the group. 2. Elaboration: the concept is negotiated or presented before the bricks are put into use, but the usage of

the shared mode alters the building and thus the concept. 3. Exploration: the group lets the building emerge from the bricks without an initial idea or concept.

When using toy bricks in the process of letting a group conceptualize knowledge, the group is forced to a certain degree of joint epistemic action. The shared mode is thus an extension of the modes in which the group members can express themselves and provides a mode besides language in which the concept can be negotiated and elaborated. Other modes than toy bricks could be applied. The bricks were chosen due to the group's familiarity and skills in regards to the medium (in comparison with for instance drawing) as well as the well–documented effect of using this medium (Bjørndahl et al., 2014; Greve, in review, 2015a; Heracleous & Jacobs, 2008; Jacobs & Heracleous, 2006). Thus, regarding knowledge as a shared and metaphorical concept the joint epistemic action approach will show if and how a given group co–creates such a metaphorical concept.

2.4. Conflating Theories into a Model

As presented in the paragraphs above the theoretical framework for the following analysis is founded on 3rd generation knowledge management theory, epistemic action and in conversation analysis of metaphoricity. The common denominator is embodiment and extended mind or as it is referred to above: 4E cognition. Cognition is distributed and contextual and analyzing concepts is therefore not a mapping of static concepts but the observation and analysis of emerging concepts in social settings. What the participants create is a model or a temporarily stabile schema of knowledge by use of language and bricks. Johnson describes the emergence of metaphors as schemata. He emphasizes how using metaphors is a way of "having a world" and constructing a coherent understanding (Johnson, 2013, p. 98). In this sense, analyzing how and which metaphors for knowledge will emerge provides an understanding of how the group or organization creates coherence concerning the concept of knowledge.

The modes provided in the approach applied are: joint epistemic action, analysis of metaphoricity in language and analysis of knowledge orders. The method of analysis can be outlined like this:

1. The joint epistemic action is categorized: how does the group approach the task of creating a common model for knowledge –as illustration, elaboration or exploration? After this analysis, it is determined to what extent the common model is used for negotiating and as a common point of reference after the actual physical model has been put away.
2. The metaphoricity of the conversation is analyzed. Which metaphorical concepts are present? Are the schemas shared or only used by individuals?
3. The knowledge concept is categorized: how do the metaphorical schemas correlate with the orders of knowledge presented in theory?
4. Conflation of the levels of analysis: to what extent does the group co–create a common metaphorical schema in language and by use of joint epistemic action, and how does this schema correspond with different orders of knowledge? On the basis of the above analysis it

can be concluded? that if the group co-creates a common schema this schema can be used in developing knowledge sharing strategies. If the process is top-down the group develops parallel concepts and is divided in their approach to knowledge. This in turn would call for a different kind of knowledge sharing strategy.

3. ACTION RESEARCH STUDY: HOW CAN GROUPS SHARE KNOWLEDGE?

The manager of the group made contact with me in my capacity of knowledge researcher. The initial request was for a presentation of knowledge sharing strategies. After a brief talk, we decided on an action research study, allowing me to apply the method I have been working on for some years and allowing them to gain further insight into their tacit approach to knowledge and information sharing. Therefore, the study is not a purely intrinsic case study (Silverman, 2013: 142–143). Rather, it is a case study based on a number of instrumental case studies (ibid.). As I do not only observe the group, but also engage them in an experimental joint epistemic action, return to present my analysis, and offer them to use it in their future work, the study could be categorized as action research. This is defined as:

"[action research] seeks to bring together action and reflection, theory and practice, in participation with others, in the pursuit of practical solutions to issues of pressing concern to people, and more generally the flourishing of individual persons and their communities." (Reason & Bradbury, 2001,: 1)

As the initial motivation of this study was indeed the need to bring together theory and action as well as the need to seek practical solutions to a pressing concern, the role I played in this setting was as an action researcher.

I expected the group to behave more or less like the groups I have already studied, which would have the following consequences: the concept of knowledge is diverse both in terms of metaphoricity and orders of knowledge; the group members approach joint epistemic action in one of the three ways outlined by Bjørndahl et al. (2014), and this approach affects the following conversation (Greve, 2015a). The question posed by the manager of the group, analyzed below, was the following: How can we become better at sharing knowledge? Based on the above-described theoretical framework, the initial answer to that is: that depends on how you conceptualize knowledge. Thus, the group was submitted to a process of providing data for analysis. The design of the process was as follows:

1. The group was briefly introduced to the session and divided into two sub-groups. As one division was on location and the other was situated in Poland, this division came rather naturally. The two divisions of the group were communicating by videoconference and both divisions were video recorded.

2. The two divisions built three buildings using toy bricks. Each session lasted 5 minutes and the topics were: i) Dream office (purpose: to familiarize with bricks) ii) Experience (to prime towards a concept of knowledge linked to experience) and iii) knowledge (the actual concept of interest). After each building session the groups explained to each other what they built.
3. The bricks were put away and a conversation was facilitated on the topic of "what is knowledge".

After one month, the researcher returned to the group and presented the analysis and provided the theoretical framework. Afterwards, I engaged in a dialogue with members of the group in order to provide feedback on the process of introducing a new practice of knowledge sharing in the group. After the first new knowledge sharing session was performed the manager of the group briefed the researcher.

3.1. Analysis: The Concepts of Knowledge

The task in this study is to understand the concept of knowledge as it emerges in a group of knowledge workers through metaphoricity and joint epistemic action.

The analysis was performed as described above in 2.4: 1) categorization of approach to joint epistemic action 2) analysis of metaphoricity 3) analysis of knowledge orders present in metaphors and 4) conclusion of the level of co-creation of a shared schema of knowledge.

3.1.1. Exploring Knowledge in Bricks

The two divisions of the group approached the process of creating a concept of knowledge in toy bricks as exploration. Both divisions started using bricks and from that their concepts emerged. Division 2 started by talking a little but did not base their building on what they talked about. Thus, the process of joint epistemic action was bottom-up in the division containing the manager as well as in the remote division. Figure 1 below shows the two buildings.

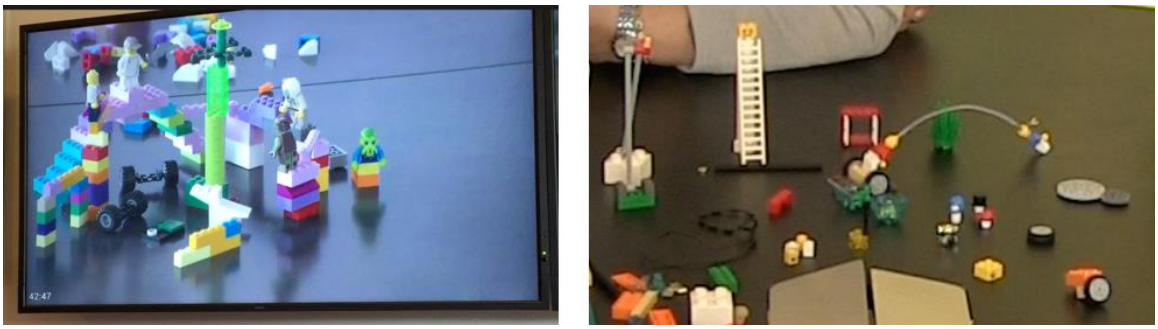

Figure 1: On the left: knowledge building made by division 1. On the right: knowledge building made by division 2.

The bricks as such serve as a medium for joint epistemic action. As concepts, they are referred back to and used in the conversation about knowledge, both during the building tasks and after the bricks have been put away. The groups could have made drawings or used playdough as well. The levels, the people and the wheels might be part of the metaphoricity simply because the elements are in the assortment of bricks. However, the relevant issue in this process is not the metaphorical concepts as a pre-existing truth about knowledge in the group. As stated by Cameron et al. above, it is essential to draw attention to the temporarily stabile concept presented in the conversation. Further, the approach that the divisions choose will reveal how likely they are to approach the definition of a concept in a bottom-up process where everyone gets to contribute or a top-down process which is controlled by a single member.

3.1.2. Diverse Metaphors of Knowledge

The second element of the analysis approaches the metaphoricity in the language. The metaphors, which became evident in the conversation, were differentiated and diverse. The following is a summary of the metaphorical concepts. The conversation was in English, which is not the native language of any of the individuals involved. The participants came from Denmark, Poland, Germany, and India. In the conversation, three temporarily stabile concepts can be identified. 1) Knowledge has levels, 2) Knowledge is an object and 3) Knowledge is a personal asset.

In table 1 below, the quotes from the conversation are presented concerning the three categories. The three concepts are shared by both divisions and are not specific to individuals.

Schema	*Quotes*
Knowledge has Levels	Starting from the not so good [in relation to pointing at the bottom of a knowledge ladder]
	Levels of knowledge
	Climb up [the knowledge ladder]
Knowledge is an Object	(we) gain knowledge
	If someone leaves, we need to keep the knowledge in the knowledge box
	Knowledge can be contained
	(you can) get knowledge from a book
	Knowledge can be dropped like pennies
Knowledge is a Personal Asset	Together we can build better and better bridges [by use of knowledge]
	(you can) get knowledge in dangerous ways
	Getting knowledge can be scary
	(there are) different kinds of knowledge: Social knowledge, work knowledge
	(you can) be king on top of the knowledge mountain

Table 1: Three categories of knowledge

The metaphorical concepts for knowledge are diverse (Greve, 2015b) and the diversity is distributed on individuals in the groups. A domain of knowledge as e.g. an object is thus not specific to individuals, but the metaphorical concepts rather seem to be shared and non-controversial. Thus, knowledge can be contained in a knowledge box or in a book, which indicates that knowledge is an object. However, it can also relate to a process of knowledge being scary to attain and something, which can be improved by working together.

3.1.3. Levels and Orders of Knowledge

Concluding on the concepts of knowledge in this particular group with regards to the knowledge theory, the idea of levels of knowledge is present in the bricks as well as in language. However, there is no theoretical reference in the conversation and it might simply be derived from the assortment of bricks containing a ladder and the fact that putting bricks on bricks creates levels. The division of knowledge as a personal asset and as an object is also theoretically foreseeable. The object knowledge is equal to the concept of information in Nonaka's framework; it can be made digital and is moveable and independent of the knower. In Qvortrup's theory of knowledge orders it reassembles 1st order knowledge. It is in books it can be contained and stored.

The personal knowledge concept has to do with working together and it is regarded as being dangerous and scary in the case conversation. It is much more individual and the employees tell stories of being alone in gaining the knowledge and wanting to share the stories upon returning to the group in order for others to use their knowledge. This, however, is what they find difficult.

3.1.4. Analytical Conclusion

On the basis of the analysis above, the conclusion on the concept of knowledge in this group is that the divisions co-create a shared model of knowledge in the toy bricks. They hold a diverse concept of knowledge which is, however, not controversial to the members of the group, and positions are not specific to individuals. As expected, the concept of knowledge is divided into something measurable and as a personal asset. The group does not address this potential dichotomy. The conversation does not reveal that they even realize that their concept of knowledge is diverse. The purpose of this analysis is not to make general assumptions about the concept of knowledge; rather, it serves to provide a foundation for the further work in this particular group concerning their knowledge sharing strategies.

3.2. Knowledge Sharing is Knowledge Creation

About a month after the session described and analyzed above, I returned to the group in order to present theory and results. The group was presented with the theoretical framework presented above in this article as well as the analysis of how they approached the building task and the concepts emerging in their conversation.

As the initial question posed by the group was how to share knowledge, this presentation of how they conceptualized knowledge led to an introduction of a change of knowledge sharing strategy.

Following the second conversation, a dialogue took place between the researcher and a member of the group, who has been made responsible for finding a new format for knowledge co-creation. The concept they chose was to co-create knowledge by use of role-play. Using a script and assigning different roles in the processes they had performed, they shared with the group what had happened in the processes they had facilitated. Then the group could discuss different solutions and dilemmas and bring up their own experience from similar situations. The manager explained the new process of knowledge sharing as a move away from "lessons learned" and towards "what did you do, and then what happened", letting the group partake in the evaluation of the learning outcome and effect on future processes. As the initial request from this manager was to provide the group with better knowledge sharing practices, the goal seems to have been reached, although not by use of a presentation or a tool but through a process revealing how the group is thinking of knowledge and how different kinds of knowledge require different knowledge sharing strategies. It is less than likely that this insight would have been made possible by a presentation alone as the relation to their own conversation and building approach helped translate the theoretical frame into their everyday work routines.

The group was given a more diverse understanding of knowledge and the division of concepts made it more clear how to approach different orders of knowledge with different knowledge sharing approaches.

4. CONCLUDING REMARKS

The claim in this article is twofold: a) The seemingly mutually exclusive knowledge concepts of "knowledge is an object" and "knowledge is a personal asset" co-exist without conflict and b) if an organization wishes to share the personal knowledge, this process benefits from the use of joint epistemic action. However, they benefit from detangling the concepts and thus from approaching the given type of knowledge with the appropriate sharing strategy. Object knowledge can be shared at meetings, in documents and online, whereas person knowledge will not flow as easily in words and thus calls for joint epistemic action and co-creation of new common knowledge.

Knowledge sharing is knowledge co-creation when the knowledge is 2nd and 3rd order knowledge. To make others understand what one has experienced and what knowledge has been gained from it, more than transfer is necessary. Further, how this can be used in making more advanced solutions and develop new products and processes seems to be the right knowledge sharing approach for the knowledge worker, at least in this case.

Understanding knowledge as a concept and embracing its diversity and contradictory nature is essential. Thus, knowledge sharing as joint epistemic action transcends exchange of words into other modes. What has been seen as a weakness in knowledge sharing can turn out to be a strength: the complex and experience-based knowledge might not be sharable, containable and manageable in the same way that information or 1st order knowledge is. Nevertheless, it is sharable, containable and manageable; it just calls for new approaches and routines. The group presented in this article proved very open to solving their problem with knowledge sharing by use of new methods and then invented their own approach. Other groups and companies might benefit from other methods. However, as the notion of our societies and workplaces as knowledge intensive becomes more accepted and the knowledge more personal and specialized, new approaches are necessary. The emphasis on knowledge sharing as knowledge co-creation follows the lines of empowering the employee as suggested by Qvortrup in the introduction.

The first step is in depth to understand the concept of knowledge in a post-industrial age and to embrace the fact that knowledge is not a uniform concept. It is culture, context and purpose dependent. This calls for an epistemological framing, which can contain a more nuanced and diverse concept and apply the appropriate approach to knowledge sharing and co-creation.

Knowledge communication (as opposed to knowledge information) is an integrated part of knowledge management and making use of more than communication in words seems paramount. Integrating a metaphor analysis and joint epistemic action in organizational knowledge communication therefore offer a new understanding of the roles of the knowledge managers and knowledge workers in knowledge expansion processes.

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