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Exploring knowledge creation processes as a source of organizational learning: A longitudinal case study of a public innovation project

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ABSTRACT

The purpose of the study is to reestablish the link between theories of organizational learning and knowledge creation – theories that in research, have been pursued as independent themes for almost two decades. Based on the literature review, I build a framework that proposes how the two streams of literature complement each other, how they are similar, and how they are different. To understand the framework's empirical applicability, I utilize it as a theoretical lens to study an innovation project in a Danish public service organization. Based on a longitudinal and participatory research strategy, I build eight propositions that are used to discuss and extend the organizational learning and knowledge creation literatures and to justify the framework's applicability. Finally, I present the managerial implications and the conclusions of the study.

1. Introduction

According to Lyles (2014), the study of knowledge creation and organizational learning is “*pursued as independent themes in research (...) and the links between them tend to be forgotten (...) because it is hard to reconcile fundamental assumptions about knowledge, information, environment and learning*” (Lyles, 2014 pp.132–133). Hence, the study of knowledge creation in relation to organizational learning is a research avenue that is seldom taken (Argote, 2011; Crossan & Berdrow, 2003), and this parallel development of both fields has supported a limited awareness of theoretical and practical advances between them for decades (Brusoni & Rosenkranz, 2014; Easterby-Smith & Lyles, 2007).

When Nonaka and Takeuchi (1995) insisted that knowledge creation in a firm was different from organizational learning, they created a membrane between the two fields that lead to the development of different theoretical constructs and definitions. This deliberate choice to disregard organizational learning has since then been noticeable in the knowledge creation literature, since the concept of learning is hard to find (Nonaka, Kodama, Hirose, & Kohlbacher, 2014; von Krogh, Ichijo, & Nonaka, 2000). Moreover, this explicit distinction between knowledge creation theories and organizational learning theories is also evident in the organizational learning community. Here, scholars utilize constructs such as change of behavior, actions or routines (e.g. Argyris, 2009) instead of speaking of the creation of new knowledge (for more examples, see e.g. Vera & Crossan, 2007). So when scholars in the field of knowledge creation do not utilize the word *learning*, and other scholars in the field of organizational learning do not apply the word *knowledge* to their research, it is a daunting task to compare and

contrast the two fields (Lyles & Easterby-Smith, 2007; Lyles, 2014).

With this study I aim to alter the tendency of diversification, since the two research paradigms can cross-fertilize each other and thus increase our understanding of how innovation and change emerge (Argote, 2011; Easterby-Smith & Lyles, 2014). This argument is predicated on the premise that knowledge and learning are intertwined. Knowledge is the dynamic content/stock created as part of the learning process, and the same knowledge influences the learning process occurring on multiple levels within the organization (see, e.g., Crossan, Mauer, & White, 2011). In this study, *organizational learning* is defined as the principal means by which an enterprise achieves strategic renewal (Brix, 2014; Crossan, Lane, & White, 1999). *Knowledge creation* is defined as the act of making knowledge created by individuals available, amplifying it in social contexts, and selectively connecting it to the existing knowledge in the organization (Nonaka & von Krogh, 2009).

In the spirit of Gioia and Pitre (1990) and Corley and Gioia (2011), I argue in the following, that my bridge-building between two theoretical orientations will enrich our current understanding of how the two phenomena interact and particularly how their theoretical and practical linkages can lead to new insights for research and practice. Consequently, the purpose of my study is to theoretically and empirically explore how knowledge creation can act a fundamental part of organizational learning and vice versa (Argote, 2011; Lyles, 2014). The goal of this exploration is to investigate and provide implications for how an empirical study that combines the two paradigms can link and extend theories in both fields.

By identifying the common ground between organizational learning theory (e.g., Crossan et al., 1999) and knowledge creation theory

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(Argote, 2011; Nonaka & Takeuchi, 1995; Nonaka, von Krogh, & Voelpel, 2006; von Krogh, Nonaka, & Rechsteiner, 2012) I propose a framework that establishes the interactions, differences, and similarities between the two theoretical orientations. Through this conceptualization I establish, that knowledge creation can occur without it leads to organizational learning, as well as organizational learning cannot occur without the creation of new knowledge. Moreover, I argue following the work of Hernes and Irgens (2012) and Weick (1996) that organizational learning can occur without using new knowledge, either because of a temporal dimension (that it is too early to use/implement new knowledge), or because the use/implementation of the new knowledge will lead to a decrease in firm/product/service performance. This framework is the manuscript's key contribution. I utilize the framework as a theoretical lens to report on a longitudinal case study (Yin, 2013) being an innovation project in a public service organization. The findings from my participatory research strategy led to the development of eight propositions. Two of these propositions represent a novel contribution by linking organizational learning and knowledge creation theory to opportunity recognition. The remaining six propositions e.g. identify how organizational knowledge influences the work of the team members more in the beginning of an innovation project compared to the later stages of their project; or that dissimilar interpretations of 'strategic important ideas' on different managerial levels lead to the decision to use and implement ideas with lower strategic ambitions than the ones asked for by the top management when defining the project. Finally, since I report on a longitudinal case study of a public service organization's entire innovation project my study contributes with its empirical usage to organizational studies (Rashman, Withers, & Hartley, 2009).

The study proceeds as follows. First, I develop the literature review to synthesize the relationship between knowledge creation theory and organizational learning theory. Then, I present the study's methodology. Thereafter, I present the findings from my participatory research strategy, during which I build 8 propositions. Then, I discuss and relate the findings to the extant theory on organizational learning and knowledge creation and I highlight new directions for further research. Finally, I present the study's limitations and the conclusion.

2. Literature review

Both organizational learning and knowledge creation theories stem from broad academic fields that do not have uniform definitions and units of analysis in their individual paradigms (Crossan et al., 2011; Easterby-Smith & Lyles, 2014; Von Krogh et al., 2000). To provide a common ground for this study, I present a brief overview of both academic fields before I focus on describing the specific streams of literature that I strive to integrate.

The field of *knowledge creation* is part of the knowledge management literature. However, studies of knowledge creation are different from studies of knowledge management since knowledge management focuses on the storage and distribution of knowledge that has already been created – often via databases and information and communication technologies (Easterby-Smith & Lyles, 2014). Therefore, knowledge management research is viewed as a constricted stream of research that does not seek to change existing knowledge but rather to distribute it (Easterby-Smith & Lyles, 2014; Nonaka et al., 2006). However, in the knowledge management research paradigm, the knowledge creation literature focuses on the creation of new – or the recreation of existing – knowledge (Argote, 2011). This stream of literature has a transformative and dynamic view of knowledge, based on the premise that knowledge changes as people become more knowledgeable (Brix, 2014). Hence, for the purposes of this study, I rely on the knowledge creation literature that explores and describes *organizational knowledge* (Easterby-Smith & Lyles, 2014; Nonaka et al., 2006). This choice is made because the organizational knowledge literature relates to the *content* of knowledge-creating processes. This issue is further explained

below.

In the *organizational learning* research paradigm, over the last four decades, many theoretical advances have been made. One stream of research is founded in psychology, viewing the individual as the change agent in the organization seeking to detect and/or correct errors (e.g., Argyris & Schön, 1978). Another stream delves into the sociological perspective, examining organizational routines and their effect on organizational learning (e.g., Cyert & March, 1963). For the purposes of this study, I rely on multi-level theories of organizational learning (Argote, 2011; Crossan et al., 1999, 2011) which integrate the individual, the group/team and the organizational levels of aggregation. This line of research is reviewed below.

2.1. Organizational learning as a systemic, multi-level view

Crossan et al. (1999) argue that organizational learning is “the principal means of achieving strategic renewal of an enterprise” (Crossan et al., 1999). Moreover, these scholars claim that organizational learning is a dynamic process that occurs over time across three levels: the individual, the group and the organization. Crossan et al. (1999) argue that organizational learning is associated with four micro-processes: intuiting, interpreting, integrating and institutionalizing¹ (the 4I framework). In the context of, e.g., interpreting and integrating knowledge, these scholars stress that organizational learning is a process that creates tension between the assimilation of new knowledge (feed forward) and the exploitation of what has already been learned (feedback) (also, see Crossan et al., 2011). Hence, the learning processes are related to exploration and exploitation (March, 1991). These processes enable the company to improve the performance of existing processes and products, and the processes create knowledge that is used to build and develop portfolios of new products/services that are imperative for future survival (Brix & Peters, 2015; Tushman, Smith, Wood, Westerman, & O'Reilly, 2010). Complementing Crossan et al. (1999), Argote (2011) argues that the organizational learning process can be understood by using the following tri-partition: *knowledge creation*, *knowledge retention* and *knowledge transfer*. According to Argote (2011), organizational learning (as opposed to individual learning) first occurs when individual members embed new knowledge into a variety of repositories such as databases, tools, routines, social networks and transactive memory systems. It is here important to stress that organizational learning does not necessarily have to result in a change of course or action for the organization (Hernes & Irgens, 2012). This argument is based on the study by Weick (1996), who determines that “When people equate learning with change, they strip the learning process of much of the constancy, continuity, and focus that are necessary for adaption” (Weick, 1996 p.738). Hence, according to Hernes and Irgens (2012), organizational learning can occur during times of continuity and without implementing the new knowledge that has been created.

In short, organizational learning is a *process* that enables collaboration between organizational actors to improve the organization's overall performance in, e.g., efficiency and effectiveness as well as new product development (Burton, Obel, & Håkansson, 2015; Easterby-Smith & Lyles, 2014). According to Argote (2011), the first part of the organizational learning process is knowledge creation (Argote, 2011).

2.2. Knowledge creation theory

Before delving into the discussion of *knowledge creation*, it is important to define knowledge as a construct. Knowledge is defined by Nonaka and Takeuchi (1995) as the “justified true belief” that enables

¹ According to their organizational learning theory, Crossan et al. (1999) stress that *institutionalizing* should not be confused with institutional theory on the population level. Instead, institutionalizing means capturing learning and using it so that it becomes embedded in the organization. For a further explanation, see Crossan et al. (2011).

the organization's capacity for effective action. According to Nonaka and Takeuchi, the concept of knowledge can be divided into a tacit dimension and an explicit dimension. The explicit dimension refers to knowledge that, e.g., can be articulated orally, communicated in documents, and stored in databases. The tacit dimension refers to the experience, thinking and feeling of the individual. These can, e.g., relate to technical know-how and skills that are context-dependent. To complement the tacit and explicit dimensions of knowledge, Choo (1998) introduces a third dimension: cultural knowledge. This dimension relates to "the assumptions and beliefs that are used to describe, and explain, reality, as well as the conventions and expectations that are used to assign value and significance to new information" (Choo, 1998). According to Choo, cultural knowledge diffuses and develops over time, depending on the ties and relationships that constitute a group or organization. In line with the cultural dimension of knowledge, Nonaka and Takeuchi (1995) argue that knowledge can exist on an individual level and on a social level (collective knowledge). The link between individual knowledge and social knowledge may be guided by elements of cultural knowledge in the organization as the individuals communicate and negotiate meaning in their daily work. In addition, Brix (2014) introduces a dynamic view of knowledge in innovation and development projects. By using the SOLO Taxonomy (Biggs & Tang, 2009), Brix demonstrates that knowledge can exist on many levels. There is, e.g., a large difference between identifying a car and driving it safely from a to b. However, the process of learning to drive a car involves knowledge creation on many levels, e.g., the cognitive skills of *knowing how* and a coordination of the large motor skills of *doing*. This leads to the discussion of knowledge creation.

According to Lyles (2014), "Firms can create it [knowledge] internally through their R & D or through generating new ways of handling situations. Also, firms can acquire knowledge from external sources such as hiring new employees who have worked for competitors or from industrial networks which allow the firm to be in direct contact with advanced knowledge of other firms" (Lyles, 2014). Consequently, knowledge creation represents the process of enabling people to create new insights such as eureka moments or additional or alternative views on existing knowledge (Brix, 2014). This process can be executed deliberately and mindfully by following concrete methodologies and/or creative processes, and the process can be goal-free or goal-driven (Kao, Wu, & Su, 2011). In addition, the process can occur less mindfully, e.g., by waiting for new opportunities to emerge, relying on serendipity (Weick & Sutcliffe, 2006). When people become aware of the new or the altered knowledge, they can start codifying and developing it such that the "justified true belief" becomes less uncertain and more structured (O'Connor & Rice, 2013; Von Krogh et al., 2012). This initial process enables the knowledge to be placed into organizational repositories, and therefore, it facilitates retention, new alterations and transfer – a process that is frequently related to as organizational learning (Argote, 2012).

In short, knowledge creation represents a focus on the *content* of the knowledge that has been and is being created. It concerns how different types of knowledge can be created individually and collectively through different social and cognitive processes of action and interaction (Brix, 2014; Lyles, 2014; Nonaka et al., 2014).

2.3. Linking organizational learning and knowledge creation theories

Hitherto, I have used the review to establish brief interpretations of organizational learning and knowledge creation. Table 1 suggests that the knowledge creation process initiates at the individual level with *personal knowledge* being generated via a sensemaking process (e.g., Cohen & Levinthal, 1990; Nonaka, 1994; Weick, 1995a). When the individual uses his/her personal knowledge to interact with other individuals, they have to absorb this knowledge and make sense of it (Cohen & Levinthal, 1990; Nonaka & von Krogh, 2009). This interaction represents both a process of sensemaking and sensegiving

(Gioia & Chittipeddi, 1991). Through interpersonal interaction, *collective knowledge* is created as a collective sensemaking process in which the personal knowledge of all interacting individuals is used to negotiate meaning as a *knowledge conversion* process (Nonaka & von Krogh, 2009). At this level, organizational learning has not occurred because the new personal and collective knowledge has not been documented or implemented in organizational repositories with the purpose of creating renewal (Argote, 2012; Crossan & Berdrow, 2003; Crossan et al., 1999; Jensen, Johnson, Lorenz, & Lundvall, 2007).

Therefore, I argue, that it is possible to study the two phenomena, *knowledge creation* and *organizational learning*, as both separated and connected entities. The enabling activities that support the creation of the different types of knowledge illustrated in Table 1 is explained by relying on the four micro-processes from Crossan et al.'s (1999) organizational learning framework. I claim that *intuiting* and *interpreting* processes create individual knowledge, *interpreting* and *integrating* new knowledge create group/team knowledge, and *integrating* and *institutionalizing* new knowledge create organizational knowledge and, consequently the foundation for organizational learning to occur (Crossan et al., 1999, 2011). This division of learning and knowledge creation on different levels of aggregation also establish that organizational learning is not guaranteed merely because the organization's members create new knowledge and consequently get more knowledgeable (see, e.g., Brusoni & Rosenkranz, 2014; Jensen et al., 2007). Hence, I echo the studies of Crossan et al. (2011) and Brix (2014) claiming that knowledge is created through a learning process, and that the same knowledge influences the learning occurring on different levels of aggregation.

2.3.1. An integrative framework for organizational learning and knowledge creation

In the following, I build on the review above to provide arguments for how and why the organizational learning and knowledge creation literatures are both connected and disconnected. Fig. 1 illustrates how *organizational learning* can occur in a given context in which (strategic) renewal is on the agenda.

According to Crossan et al. (1999), Crossan and Berdrow (2003) and Burton et al. (2015), it is important to understand how the *organization as context* enables (or disables) the process for (strategic) renewal. The importance of the context (the *ba*) is also stressed by knowledge creation scholars as a highly influential aspect, which may not be forgotten in the search for development or innovation (Nonaka et al., 2014; Von Krogh et al., 2000). To exemplify the necessity of the context, both streams of literature state that the top management has to create an enabling context that incentivizes employees to initiate the organizational learning/knowledge creating process by sharing and making the newly created knowledge accessible for others so that it can become imbedded in the cultural and collective knowledge of the organization (see also Burton et al., 2015; Curado, 2006). This argument is based on, e.g., how the leadership style and incentive structure foster or hamper knowledge creation and the "exchange behavior" of knowledge among group/team members, and between team members and decision makers (Nonaka et al., 2006; Peronard & Brix, in press). In line with this proposal, Jakobsen (2015) argue that a clear strategic focus is important for both the organizational level and the micro-levels (the *bas*) in which the individual and/or the group/team operate. Jakobsen stresses that a clear focus influences the actions and behaviors of employees and managers so that they are attuned to the level of ambition and change that is expected from new projects.

This context for strategic renewal is dependent on the existing *organizational knowledge*. Organizational knowledge influences both the individual person as a knowledge creator and the group/team of individuals in their collective knowledge creation and conversion processes. Therefore, it is important to study not only the process of knowledge creation but also how the existing organizational knowledge such as work tasks, rules, and heuristics influence the knowledge

Table 1
Types and levels of knowledge.
Source: Author's development.

Unit of analysis	Types of Knowledge	Comment(s)	References
Individual	Personal knowledge (<i>Created as a process of intuiting and interpreting</i>)	Knowledge is created by the individual using his/her educational, vocational and avocational backgrounds and experiences. Learning is cumulative building on existing knowledge and hence more difficult in novel domains. “How can I know what I mean until I see what I say?”	Cohen and Levinthal (1990) Crossan et al. (1999) Nonaka (1994) Weick (2012) Brix (2014)
Group/team	Collective knowledge (<i>Created as a process of interpreting and integrating</i>)	Knowledge is created and converged as a ‘negotiation of meaning’ as well as collective sensemaking and sensegiving processes between individuals. “How can we know what we mean until we see what we say?”	Crossan et al. (1999) Gioia and Chittipeddi (1991) Weick (2012) Nonaka and von Krogh (2009)
Organizational	Organizational knowledge (<i>Created as a process of integrating and institutionalizing</i>)	Knowledge must be documented and/or used as part of the organization’s intellectual capital, e.g. in work processes, routines and in IPR-related documents. Knowledge is embedded in the organization’s culture and it is collective (or available e.g. via transactive memory systems). People know <i>how</i> to act and react to certain situations, and most often also <i>why</i> their response to the situation is appropriate.	Weick (1995a) Crossan et al. (1999) Rozenblit and Keil (2002) Argote (2011) Brix (2015)

creation behavior occurring (Argote, 2012; Crossan & Berdrow, 2003; Nonaka et al., 2006).

Fig. 1 also establishes how *individual knowledge creation* stimulates *group/team knowledge creation*, and vice versa. In the group/team knowledge creation context, it is important to understand how knowledge is created and converted as an iterative process into *knowledge for (strategic) renewal* that can be diffused to the relevant decision maker(s) (Nonaka, 1994). According to Fig. 1, organizational learning first occurs when a decision on the knowledge for strategic renewal is made. This decision can be a divided into three categories: 1) a *decision not to use the new knowledge*, 2) a *decision to ask the group/team to rework and improve the new knowledge*, or 3) a *decision to use the new knowledge* and implement it as a new or changed part of organizational knowledge. The formal decision to use, to rework or not to use the new knowledge in the organization is dependent on the organization’s preparedness to proactively absorb the new knowledge for strategic renewal (see Crossan & Berdrow, 2003). Alternatively, it is dependent on the ability

of the decision makers to evaluate whether the use of the new knowledge will leave the organization or its products/services in an inferior situation compared to existing activities (Hernes & Irgens, 2012).

According to the integrative framework, I propose that the overlooked link (Lyles, 2014) between knowledge creation and organizational learning theories may be the deliberate process of refining new knowledge so that it fits the organization and its strategy for exploration and exploitation (Burton et al., 2015; Curado, 2006; Kao et al., 2011; March, 1991). This process of refinement is what Nonaka and von Krogh (2009) refer to as *organizational knowledge creation*, in which newly created knowledge is promoted in the organization among its members and in which the new knowledge is selectively connected to existing knowledge in the organization. Nonaka et al. (2006) argue that organizational knowledge creation is “the process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting it to an organization’s knowledge system” (Nonaka et al., 2006 p.1179). A similar underlying process is *institutionalizing* in the

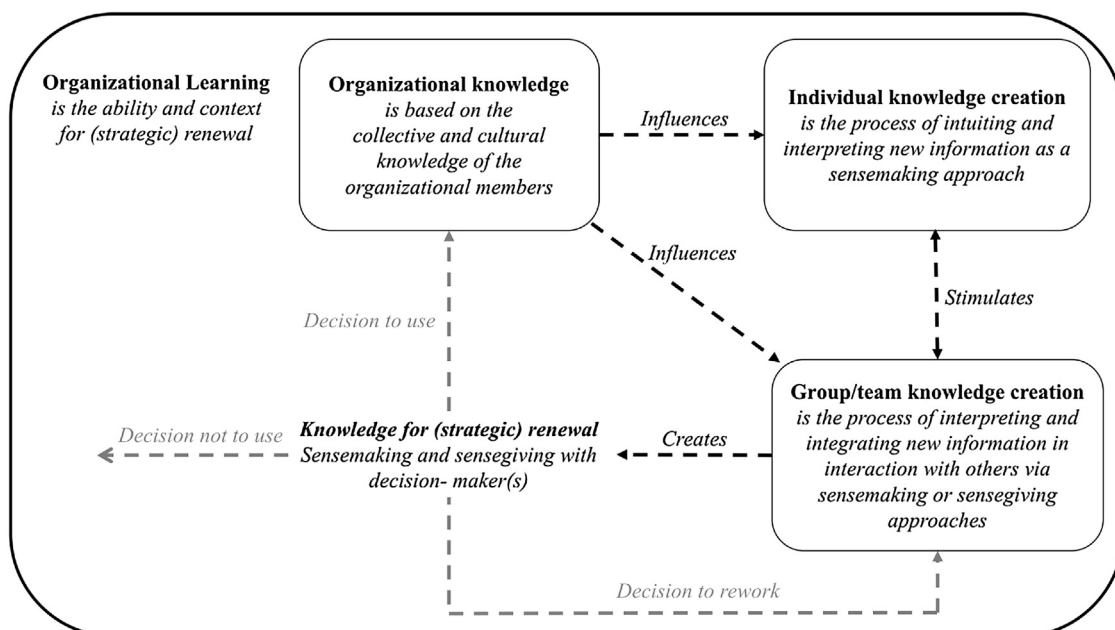


Fig. 1. Integrative framework for Organizational Learning and Knowledge Creation.
Source: Author's development.

organizational learning literature (Crossan et al., 1999; Crossan & Berdrow, 2003). Crossan, Lane and White argue that institutionalizing is “(...) the process of embedding learning that has occurred by individuals and groups into the organization, and it includes systems, structures, procedures, and strategy” (Crossan et al., 1999). Hence, by comparing the two definitions from each stream of literature, it is argued that there exists a common ground between knowledge creation and organizational learning theories since both streams agree on the process of making individual and group/team knowledge organizational. However, the discussion of the framework also leads to a bold claim concerning empirical studies of organizational learning. Studies that represent a fragmented picture of an organizational learning process do not represent the study of organizational learning; they represent the study of knowledge creation. Hence, unless a decision is made on a formal organizational level with regard to the newly created knowledge in such empirical processes – to use, to rework or not to use the knowledge – these studies are not to be labelled with the keyword of organizational learning. Although my claim is bold; it strongly resonates with the arguments of Crossan and Berdrow (2003), Felin and Hesterly (2007), and Lyles (2014); who emphasize the importance of reporting on full stories of innovation and organizational learning in the creation and development of robust theories. Hence; the integration of the organizational learning and knowledge creation theories in Fig. 1 can represent a theoretical contribution since it provides researchers with a tool for structuring and analyzing empirical data from full-scale innovation and learning projects. The framework clearly distinguishes and integrates knowledge creation and organizational learning as two different processes that occur in an organizational context. In this context; knowledge creation is an iterative individual and group/team activity that relates to the creation of content. Organizational learning is a process that enables the dissemination – and potential re-creation – of new knowledge in the same context. Combined; the systemic view of context; content and process can make established organizations continuously relevant since these perspectives can explain the what; the where; the how and the why of strategic renewal (Huber, 2011). A working definition that can be used to unite and study the two theoretical constructs can be: *Organizational learning is the process of creating new knowledge for strategic renewal and disseminating it to where it is relevant so that it can be used; reworked or rejected*. An important part of this working definition is the deliberate focus on the decision to reject the use of new knowledge because it also represents a key process in organizational learning (Hernes & Irgens, 2012; Weick, 1996). A final note regarding the creation of the integrative framework is that I have deliberately placed brackets around the word “strategic” because not all projects that seek renewal are necessarily “strategic”. Additionally; because I do not wish to delimit the potential use of the framework to explain the search for small-scale improvements. Having built an integrated framework for organizational learning and knowledge creation; I proceed to present the study’s methodology.

3. Case study methodology

I acted as participant observer in an innovation project in a public service organization, from the definition of the purpose of the project to the implementation of new initiatives. The justification for utilizing an innovation project as empirical evidence to study knowledge creation and organizational learning is based on the argument that innovation requires the creation of new knowledge and its use in practice (OECD, 2005). The focus of the innovation project was directed at creating new opportunities and developing them, with the ambition of presenting input for strategic renewal for the organization’s top management team. The ambition of the public service organization’s approach to innovation corresponds to Crossan et al.’s (1999) core definition of organizational learning and Nonaka’s (1994) and Nonaka and von Krogh’s (2009) definitions of knowledge creation. This correspondence makes

the case selection relevant for this study (Antonacopoulou, 2007; Lyles, 2014; Rosenkopf & McGrath, 2011).

3.1. The innovation project

The innovation project studied was initiated by the Division of Education Management (DEM) in the Municipality of Ikast-Brandø in Central Region Denmark. The municipality had previous experience with small-scale development projects aiming at a two-to-three percent performance increase per year. Because of increased costs and stagnant tax revenue, politicians and the top management team had to initiate projects with higher levels of ambition to seek strategic renewal for the public services provided to citizens. The purpose of the innovation project was “to increase the learning capacity among the children and adolescents in the municipality by 20 per cent so that they become better prepared for the future requirements of increased knowledge and skills on the labor market”. The goal of the project was to use human resources more efficiently and to rethink how new educational environments could support the project’s purpose. Since the municipality did not have prior experience with an innovation project with this type and amount of uncertainty, it decided to contract with an external consultancy [the Danish Technological Institute’s Center for Ideas and Innovation] to help it guide and facilitate the innovation process.

3.2. The participatory research process

The case study is based on longitudinal participatory data. Table 2 represents the timeline for the project and the key activities in the project. I was allowed to follow the external consultancy as a participant observer, from the project formulation (and reformulation) in March and April 2012 to the final presentation of the 14 business model designs to the top management team in January 2013. I waited two months to collect post-project data in March 2013 with the members of the innovation team.

In September 2014, I collected interview data with the CEO and the management team that were responsible for the innovation project. The purpose of the time-lag (Guest, 2011) between the post-project interviews was to allow the institutionalized knowledge to become part of the cultural knowledge for the organizational members (Choo, 1998). The findings from the participatory inquiry led to many insights concerning organizational learning and knowledge creation for the organization. I presented these insights at a seminar for the organization’s

Table 2
Timeline for the participatory research process.
Source: Author’s development.

Time	Key activities
April–May 2012	Project definition and contracting between DEM and the external consultancy
August 2012	The innovation project is started up
September 2012	Idea generation workshop
October 2012	Opportunity recognition workshop
November 2012	Business model prototyping workshop
December 2012	Presentation of 14 concepts to the steering committee and their feedback
January 2013	Presentation of 14 concepts to the City Council (decision-making)
February 2013	No research–secure time-lag
March 2013	Post-project interview with the innovation team members
April 2013	First reporting to the DEM by the researcher
May 2013–August 2014	No research–secure time-lag
September 2014	Second round of post-project interview with the Top Management Team
October 2014–October 2015	Data review, preparation and analysis
November 2015	Final seminar for Top Management Team and Innovation Project Managers

Table 3
Illustrating the empirical evidence.
Source: Author's development.

Data collection activities	Time spend	Data types
Participation in meeting	75 h	Field notes: 90 pages Pictures: 35 Audio recordings: 8 h
Fieldtrips	20 h	Field notes: 12 pages Pictures: 70 Audio recordings: 0 h
Workshops	18 h	Field notes: 70 pages Pictures: 170 Audio recordings: 8 h
Semi-structured and structured interviews	20 h 8 informants 2,5 h average	Field notes: 118 pages Pictures: 3 Audio recordings: 20 h
Direct observation in project related activities (and unstructured interviews)	190 h	Field notes: 45 pages Pictures: 75 Audio recordings: 0 h
Sum	323 h	Field notes: 335 pages Pictures: 353 Audio recordings: 28 hours

top management team and the innovation project manager in November 2015.

Table 3 presents the time that I used on different activities when collecting data as well as the data sources and the amount of data to which I gained access. The data sources represent field notes – both electronic and paper notes such as drawings, spreadsheet data, and written text. The data sources also include interview transcripts, status reports, photos, and audio and video files. I also gained access to the content of the idea management system that was utilized in the project. Finally, I obtained a copy of the decision-making reports from the DEM management team. This data material enabled me to report on the explicit knowledge that was created and used throughout the innovation project. Moreover, the data allowed me to report on the tacit dimension of knowledge creation since I could document the actions and behaviors of the innovation team and the top management team as the innovation project progressed (Crossan & Berdrow, 2003; Nonaka & von Krogh, 2009).

The main value of my participatory research strategy is that it enables me to utilize multiple sources of data to extend the incumbent theory and to identify new areas of inquiry for research (Colquitt & Zapata-Phelan, 2007; Crossan & Apaydin, 2010; Langley, 1999). The units of analysis are 1) the knowledge-creating behaviors of the innovation team members and 2) the institutionalizing behavior of the decision makers.

3.3. Data analysis and theory extension

Inspired by the work of Danneels (2002), I use the extended case method to integrate and synthesize my data with existing bodies of work. Therefore, my research objective is not to build a new theory – rather, it is to consolidate and develop what has already been done (Burawoy, 1998). In practice, I followed Danneels (2002) to structure and analyze my data. I read through my field notes, the interview transcripts and the project-related documents such as project reports, decision reports and idea management system data. The purpose of this work was to identify patterns and themes that could represent small interesting stories and insights (Langley, 1999). In this process, I created analytical notes containing pieces of new insight that were relevant or may have been relevant to further investigate. When I could not find more insights, I presented the analytical notes to members of my research group, which I did to gain inspiration – and to discuss with them, if the empirical evidence could be relevant to utilize within the

context of organizational learning and knowledge creation theory. My colleagues assisted me in combining these analytical notes into conceptual groups that could be relevant in this/these theoretical context (s). After getting their help, I reviewed the empirical evidence once again pertaining to these groups. Based on this work I developed eight empirically-driven propositions. I used the propositions to search for existing theories within organizational learning and knowledge creation which could be extended, complemented or questioned. It was in this process that I outlined the content and contributions that are presented in this manuscript. The propositions and their potential relationship with the extant theory was strengthened by obtaining collegial feedback after having presented my work in progress to two research groups at other universities. The purpose of these presentations was to increase the robustness and credibility of my analysis, the empirical findings and the contributions of my study (Burawoy, 1998; Danneels, 2002; Eisenhardt, 1989). Since there are many different views and opinions about what constitutes a decent proposition I wish to clarify my thoughts concerning developing these. First, I develop propositions and not hypotheses, so the testability argument is not a methodological requirement in an explorative study like this (Eisenhardt, 1989). Second, according to Weick (1995b) an empirical article exploring and describing novel phenomena – like this one – can represent an ‘interim struggle’ which can help scholars to develop more comprehensive theories in the future. Therefore, if my propositions were reduced to “if – so” statements or alike, then both the value of my qualitative research approach would be decreased and the opportunity for future theorizing would be weakened (Colquitt & Zapata-Phelan, 2007). Instead, my wish with the developed propositions is to make awareness of the complex situations I observed as being non-obvious during my study, so other scholars will get the opportunity to further study and thus refine the propositions – perhaps into concrete, testable explanations (Corley & Gioia, 2011).

4. Findings

I structure the findings by using the integrative framework developed in Fig. 1. Therefore, I begin this section by briefly explaining the Municipality of Ikast-Brandø and the DEM as the *context for strategic renewal*. Thereafter, I describe how the *organizational knowledge* influenced the team members throughout the project. Then, I present different situations for *individual knowledge creation* and *group/team knowledge creation*. Hereafter, I explain how and why the decision makers decided to either use or not to use the new knowledge with which they were presented. Throughout the presentation of the findings, I build 8 propositions that are used in the discussion and implications section below. Finally, I conclude the findings section with my reflections on the advantages and disadvantages of applying the integrative framework as theoretical lens.

4.1. The context for strategic renewal (organizational learning)

On a strategic level, the Municipality of Ikast-Brandø is a unique public service organization since it is one of the few Danish municipalities that has been allowed to act as an “Entrepreneurial Municipality” [in Danish: Mental Frikommune]. In practice, this entails that the municipality is allowed to conduct strategic pilot studies that are radically new compared to the traditional method of providing public service to citizens. On a tactical level, the top management team spent two months (March–April 2012) on defining, redefining and designing the innovation project. First, a steering committee was created by upper level managers to act as the overall authority over the innovation project. Then, the steering committee and the top management team defined and redefined the purpose and the goal of the project according to the Municipality’s entrepreneurial strategy. An innovation team was assembled by employees from the DEM who found participation in the innovation project to be interesting. Thereafter, an

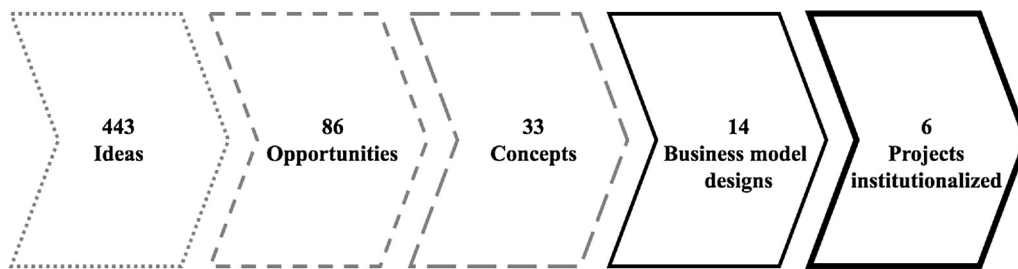


Fig. 2. From ideas to implementation in the DEM innovation project.
Source: Author's development based on the idea management system.

external consultancy with experience in innovation management was contracted to lead the innovation project. When the formal definition of the purpose and goal of the innovation project had been established, the top management informed the innovation team and the consultancy of its ambitions for strategic renewal. To motivate the innovation team and to show support for the work with knowledge creation, the top management team was present at formal workshops, and it was positive in relation to the project during the process to incentivize. A date was set for the preliminary presentation of new knowledge to the steering committee, and a date two months later was planned to present the new knowledge to the City Council. In August 2012, the innovation project commenced.

4.2. Organizational knowledge

As part of my participatory research strategy, I observed that the employees in the innovation team began to change their attitude towards both new ideas and the current manner in which they performed their jobs during the process of opportunity recognition. It seemed that the *organizational knowledge* had less influence on the opinions and attitudes of the innovation team members as the project progressed. Since I did not want to influence the innovation team and make them aware of the emerging change in attitude and behavior, I waited to confront them with the anomaly in the post-project interviews in March 2013. During these interviews, the anomaly was acknowledged by the team members. One team member said, “Our behavior in the team has changed because we have learned from the innovation process that it does not ‘hurt’ to play with different ideas and thought experiments and try to create new knowledge based on them. The innovation project has caused me – and my fellow team members – to explore new ideas and opportunities more than we ever have before. And that is nice...!” Another team member exemplified his considerations concerning the change of attitude over time: “By being forced to work appreciatively with the good things we do and trying to consider whether we could do something with even more effect was a gift to us because we actually started to discuss and consider the output of completing or participating in different activities. This simple questioning of our everyday activities and the fact that the external consultants did not accept a quick answer for ‘the truth’ actually made us realize that things could be drastically reconsidered!” The same opinion is echoed by another team member; she said, “Yes, my attitude towards the job has changed during the innovation project: Today, I am not embarrassed to say out loud that our profession is to take care of children and nothing else. – However, I use this bold statement to create a burning platform for my colleagues so that they can realize that they need to rethink their own way of performing their jobs as pedagogues. In other words, I try to directly and indirectly force them to think of the specific learning outcome that can potentially be gained by the children when they are participating in the given activity!” The line of examples and arguments presented here explains the causal relationship between the aspect of time and the team members’ perception of organizational knowledge in relation to the innovation project. Based on this explanation, I build the following propositions in relation to organizational knowledge.

Proposition 1. *Organizational knowledge has a larger influence on team members’ perception of the value of new ideas at the beginning of an*

innovation project compared to the subsequent stages of it.

Proposition 2. *Organizational knowledge has a larger effect on team members’ perception of the correctness of the manner in which they perform their work tasks at the beginning of an innovation project compared to the subsequent stages of it.*

4.3. Individual and group/team knowledge creation

For the Municipality of Ikast-Brande and its DEM, the innovation project led to the creation of a large amount of new knowledge that was documented in an idea management system by the innovation team and the external consultants. Fig. 2 provides an overview of the knowledge that was created in the innovation project.

After the purpose and goal of the innovation project were determined and the project was initiated, the innovation team ran a co-creation workshop with 20 participants who were all direct or indirect stakeholders in the project. The workshop resulted in 443 ideas that, in practice, were represented by short sentences on yellow post-it notes. These ideas were entered into the idea management system. After the workshop, the team members were instructed by the external consultant to access the idea management system and scale/rank the 443 ideas according to their own perception of the “*potential and relevancy of the idea according to the innovation project’s purpose and goal*”. When the innovation team had completed this task, it was submitted to a two-day “opportunity recognition” workshop. This workshop led to the recognition of 86 opportunities that were represented by 1) a headline and 2) a brief description of the content and context for the opportunity – including the explicit assumptions. At the end of this workshop, the team members were asked to individually choose the opportunities that they found the most interesting and to take individual responsibility for the further development of these ideas. Status meetings or co-development meetings were arranged by the external consultants every second week to secure progress in the project. The iterative process of working alone and working in the team on opportunity development led to the creation of 33 concepts. A total of 14 out of 33 concepts were selected to be developed into business model designs by the team members. These 14 business model designs were first presented to the steering committee and subsequently to the City Council. Within the years 2013 and 2014, the decision makers decided to use 6 of the 14 business model designs.² The interactions among the team members and between the team members and the external consultants during the knowledge creation processes explained above led to many interesting insights. These are presented in the following two sections: 1) insights from the first team meeting and 2) insights from the opportunity recognition workshop (Picture 1).

² An important note regarding the study is that the Danish Government decided to create a new reform of the national Danish school system during the innovation project. Major changes that led to high degrees of uncertainty for everyone in the school system were announced, which may have influenced the decisions that were made concerning the project, concerning both the time used in decision making and the six business model designs that were used.

**Picture 1.** The first team meeting.

Source: Author's own photo archive.

4.3.1. Insights from the first team meeting

During the first team meeting, it came to my attention that the team members began to negotiate meaning in regard to the purpose and goal of the innovation project. This was done after the project's purpose and goal had been presented to the team by the steering committee. During small talk, the team members were positive about being part of the innovation team, but they were also skeptical with regard to whether they could actually create ideas that could potentially have a large impact on the organization. This small talk led to an extensive negotiation of meaning in regard to the purpose and the goal of the project. The process of the negotiation of meaning is outlined in the following: *One project member told the other team members that his interpretation of the project was (...). Then, another team member said that she had a different opinion about the project, being (...). Thereafter, a third team member said that she found it to be a mix of the first team member's interpretation and her own opinion. This pattern of interaction continued among the team members, and the external consultant took over and said that the strategic ambition of the project was (...).* This interaction led to a new iteration among the team members that combined the project's strategic ambition and each others' insights into a united understanding of where they were going with the project. Hence, the team negotiated meaning in regard to the project, and team members used their individual interpretations to inform other team members about their personal sensemaking of the project. The team members then used this personal sensemaking as leverage to frame the project as a sensegiving approach to each other. In this context, it is interesting to observe how team members in a project that was defined "top-down" needed to go through this collective sensemaking process about the project's purpose and goal. This was done to convert their personal knowledge into the collective group/team knowledge that acted as an overall framing of the project. This insight leads to following proposition:

Proposition 3. *An innovation project that is initiated as part of a top-down decision undergoes a "negotiation of meaning" among team members so that they can make sense of it.*

4.4. Insights from the opportunity recognition workshop

The opportunity recognition workshop occurred at a nearby hostel to prevent the team from being biased by its organizational knowledge and to minimize interruptions from coworkers in the creative process (Picture 2).

The external consultant initiated the workshop by introducing the purpose and goal of the two-day seminar. He instructed the team how the process was going to proceed and how the knowledge from the

opportunity recognition was to be entered into the idea management system by his colleague. The workshop began at 2:05 pm with the presentation of the first idea, and the team worked on opportunity recognition until 10:15 p.m. By the end of the first day of the workshop, the team had recognized 29 opportunities that were relevant for the purpose and goal of the innovation project. During these eight hours, the team went through multiple processes and iterations of "negotiation of meaning". Without the external consultants and the team members being aware of what I was doing, I timed the opportunity recognition processes of each of the ideas. See Fig. 3.

Fig. 3 illustrates interesting perspectives for the study of team knowledge creation. It took the team 35 min to recognize the first opportunity when the external consultant read aloud the top-ranking idea in the idea management system. Once again, the team began to negotiate meaning in regard to the purpose and the goal of the innovation project, and team members used sensemaking and sensegiving approaches to agree on a common frame of reference. The time used on opportunity recognition for the next two ideas accounted for 17 min each, which represented almost half as much time compared to the first idea. Here, the framing that had been developed during the recognition of the first opportunity was used to discuss and make sense of the new ideas. This leads to the following proposition:

Proposition 4. *The time spent on opportunity recognition decreases as team members get used to converting their personal knowledge into group/team collective knowledge.*

During opportunity recognition, the team members engaged in different types of dialogue as part of their sensemaking and sensegiving approaches to converting their individual knowledge into collective knowledge. I documented four types of dialogue: 1) convergent dialogue, 2) divergent dialogue, 3) flow dialogue, and 4) rejection dialogue. *Convergent dialogue* occurs when the team members treat two ideas as one opportunity because they are similar. *Divergent dialogue* is performed when one idea is divided into two different opportunities by the team members because they define important differences in, e.g., the context or level of strategic ambition. *Flow dialogue* represents the interactions among the team members when they complement and build on each others' ideas. Finally, *rejection dialogue* occurs when the team members decide that the idea is not sufficiently interesting to pursue. During the different types of dialogue, I observed that the team members frequently utilized two different strategies in their sensemaking approaches: *opinion-driven* meaning negotiation or *experience-driven* meaning negotiation. This insight emerged during the workshop because the external consultant (or other team members) asked a person "why" s/he had a particular interpretation of an idea. The



Picture 2. Opportunity recognition in action.
Source: Author's own photo archive.

answers to this question ranged from “*I just think so – it is a gut feeling!*” to “*I saw it once in a previous job that I had!*” As time went by and the team members became comfortable talking freely together, the knowledge conversion process was accelerated, and the team members utilized their personal knowledge to stimulate group/team discussions. Less time was spent on meaning negotiation as the day progressed (see, e.g., the difference between ideas 2–5 and 22–27), and less focus was directed at sensegiving among the team members. By the end of the day, the average time that was spent on each recognized opportunity had an approximate duration of 12 min. A calculation of the time that was spent on opportunity recognition during the second day of the workshop led to a total average time of 10 min. The second day also revealed a similar pattern of how less time was spent during the recognition of 39 opportunities. A total of 12 ideas were not used in the opportunity recognition process because within seconds the team agreed not to pursue them further. The empirical evidence presented above leads to the following propositions:

Proposition 5. *Group/team knowledge conversion processes are constituted by dialogue of 1) conversion, 2) diversion, 3) flow, 4)*

rejection or by a combination of these.

Proposition 6. *Group/team knowledge conversion is based on opinion-driven and/or experience-driven attitudes and behaviors.*

4.5. Knowledge for strategic renewal

The interaction between the team members and the external consultants led to the development of 14 business model designs that were presented to the project's steering committee in December 2012. The steering committee was positive about the knowledge with which it was presented. Thereafter, the team and the external consultants used the idea management system to create an idea catalogue and a slide deck presentation of the business model designs. These documents were distributed at the formal presentation of the project's findings to the City Council in January 2013. See Table 4 for a brief summary. Within a few months after the presentation to the City Council, the idea catalogue was published online on the municipality's homepage, and the decisions made were announced as the results of the project ultimo

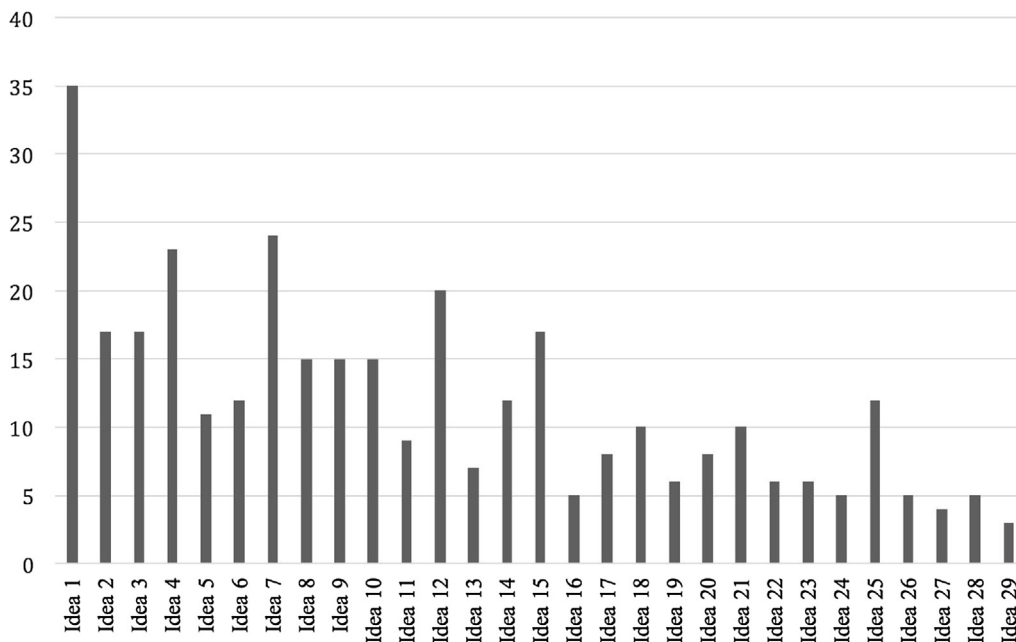


Fig. 3. Minutes spend on ‘negotiation of meaning’ during opportunity recognizing.
Source: Author's field notes.

Table 4

Summary and status of the 14 business model designs.

Source: Author's development – data from idea management system and interviews.

Concept Name	Description	Potential	Status
"All day school"	The before and after school (BAS) institution is fully integrated with the elementary school	High potential	Not implemented
From caretaking to learning	Linking BAS activities with the school curricula	Medium potential	Implemented
Learning via 3D prototyping	The BAS institutions PCs are not only used for playing games; also for simple programming	High potential	Not implemented
RFID badge for children to locate them when playing outside	Less time spend on locating children playing outside the BAS premises provides more time to develop learning activities	High potential	Not implemented
Joint activities with local clubs and associations	Inviting local sport clubs and associations to arrange activities for the children provides insight about new hobbies and fun exercise	Medium potential	Implemented
Pedagogues help in the primary school	Pedagogues become part of the primary school as teachers and facilitators of good social behavior and interactions	High potential	Implemented
The BAS institutions as elementary school	The BAS institutions are responsible for linking all activities such as sports, education and play to the curricula in close collaboration with the teachers	High potential	Not implemented
Competitions as creative capability building	It is possible to compete in almost everything; competitions can be used as valuable lessons for young children	Low potential	Not implemented
Playing as learning	The children's' interests and hobbies are used to learn new things and be aware of the knowledge in use	Medium potential	Implemented
Participation in mandatory themes	All children have to select a certain theme to work on in the BAS institution.	Medium potential	Not implemented
Outdoor pedagogics	Focus is on using outdoor areas to increase the activity level and motivation for exercise and play among the children	Medium potential	Implemented
The Entrepreneurial BAS institution	Local enterprises invite children to company visits and get the children's views on the company and its products	Low potential	Implemented
Focus on the pre-teenage children	Create specific BAS institution that focuses on this group of children and their interests	Low potential	Not implemented
Focus on life-proficiency	Include the children in e.g. cooking, cleaning and recycling activities in the daily work	Medium potential	Not implemented

2013.

Interestingly, not all of the knowledge for strategic renewal created by the team represented business cases that could lead to the realization of the purpose and goal of the innovation project. As demonstrated in Table 4, the decision makers mostly decided to implement the knowledge created that had medium potential for strategic renewal. Only one business model design with high potential was implemented. During the post-project interview with the Chief Operational Officer in October 2014, I asked why the decision makers had mostly chosen to seek strategic renewal by using the knowledge from the business model designs with medium potential. He responded, "Well, the team presented some bad ideas. When I say bad ideas, I am referring to ideas that did not meet the strategic ambition of the innovation project. Having said this, I acknowledge that some of the ideas have potential, and I see the business case (...), but the actual decision to use the ideas in the departments is not my task – that responsibility lies with the head of that department!" He continued his line of reasoning: "The problem is – I guess – that some ideas that seem radical to one group of employees may seem incremental to others. Thus, we have started up a project with strategic renewal as our ambition, and now, the decision makers, are focusing on using the incremental ideas – perhaps because they find the ideas to be strategically important. Thus, we are currently working on an alignment of the employees' and the line managers' interpretation of 'innovation for strategic renewal' for future projects!" The same view on the non-alignment of interpretation among the employees concerning "what innovation for strategic renewal is" was highlighted by a member of the top management team in the same round of post-project interviews in October 2014. She said, "I just interviewed three managers on different operational levels in our municipality. The subject was innovation. When I went out to conduct the interviews, I was certain that their thoughts and opinions on innovation were similar to mine: Innovation requires methods, processes and collaboration across disciplines – and high ambitions. I must admit that I was wrong. Our interpretations of innovation and strategic renewal were not aligned!" Hence, a clear link between the purpose and goal of the innovation project was not made clear to the managers with decision-making authority. These insights lead to following propositions:

Proposition 7. *If organizational members have not aligned their interpretations of "ideas for strategic renewal", then the project will*

provide decision makers with ideas that have low, medium and high levels of ambition according to the strategized purpose and goal.

Proposition 8. *If decision makers on different levels in the organization have dissimilar interpretations of "ideas for strategic renewal", then they will not decide to use the most ambitious ideas according to the innovation project's purpose and goal.*

The decision makers offered an interesting perspective on propositions 7 and 8 during the seminar that I arranged in November 2015. Their explanation represents a dynamic perspective on the decision to use or not to use the newly created knowledge. One decision maker stated that "The decision to use our scarce resources on creating a pilot study based on a radical idea is not easy; some of the radical ideas that were presented cannot be measured because we do not know what to measure. On the other hand, I am sure that, although an idea is not initiated as a new project immediately, the idea may be used for subsequent purposes in another context or in another project. Thus, merely because we do not explore the concept any further or exploit the potential instantly does not mean that the idea is never going to be used!" This attitude was acknowledged by the other participants in the seminar, which supports the dynamic perspective on the aspects of knowledge, uncertainty and time.

4.6. Reflections on the framework as empirical lens

The use of my framework as theoretical lens has made me aware of following advantages and disadvantages pertaining to the use of it. An advantage of relying on the integrative framework is that it enables me to report on a full story of innovation (Crossan & Berdrow, 2003; Felin & Hesterly, 2007; Lyles, 2014). This is argued, since I would not be able to study both the content (the knowledge created) and the process (the interaction between the team members and the behavior of the decision makers) if I relied on one of these theories in its purest form. Another advantage concerning the use of the integrated model is that it enabled me to establish that there is a lot of individual and group/team knowledge creation occurring in organizations, that is not disseminated to decision makers to make possible organizational learning. This is argued since the team members in the Ikast-Brande case recognized many ideas and elaborated these to 33 concepts, but only 14 of these

were developed into business model designs that were reported to the decision makers.

A disadvantage of utilizing the integrative framework in the short form of an academic manuscript is that it requires the researcher to report on data in relation to both context, content and process. It is a delicate process to present data that make sense for the reader so it is both understandable as well as robust and convincing enough to make a clear case for new theoretical advances. My way of handling this issue has been to follow the recommendations of [Corley and Gioia \(2011\)](#) and therefore report on the non-obvious data that my integrative framework facilitated me in identifying.

5. Discussion & implications

I utilize the content of the “organizational learning and knowledge creation” framework to structure the discussion while relating the findings to the reviewed literature on organizational learning and knowledge creation (cf. [Danneels, 2002](#); [Rosenkopf & McGrath, 2011](#)). Moreover, the discussion claims how the empirical data can be used to illustrate the framework’s theoretical contribution to the call for research on the link between organizational learning and knowledge creation by [Crossan and Berdrow \(2003\)](#), [Easterby-Smith and Lyles \(2014\)](#).

5.1. The context for strategic renewal (organizational learning)

My fieldwork helped me determine that the top management team in the Municipality of Ikast-Brande gave importance on considering how knowledge from the project-led learning was to be disseminated to both the administrative and political decision makers so that the new knowledge had a better chance of being adopted and used (see [Brady & Davies, 2004](#)). For example, the top management had planned a final review meeting with the project’s steering committee for the team to make a preliminary presentation of the 14 business model designs so that the team could obtain feedback before the official presentation to the City Council. Moreover, the top management team followed the recommendations of [Lyles \(2014\)](#) and spent many hours and held numerous meetings to formulate and reformulate “the right question” for the innovation project. It also received criticism and feedback from the external consultancy on the project’s definition in relation to the strategized purpose and goal. Hence, an effort was made to avoid ‘type III errors’ ([Lyles, 2014](#)) that represent projects that are initiated too quickly with the wrong focus. The findings at this level indicate that the case organization considered the importance of the leadership’s role in the project. This point is argued because important issues of organizational design were used to plan and facilitate the move from exploration to exploitation and the managerial focus was on incentivizing the team members so that they became motivated to create the foundation for change ([Burton et al., 2015](#); [Curado, 2006](#); [March, 1991](#); [Crossan et al., 2011](#)). Hence, my study determines that the Municipality of Ikast-Brande’s pre-project work in planning and formulating its ambitious innovation project was executed reasonably, since they worked dedicated on preparing the context for strategic renewal for the new innovation project. Interestingly, I found at the first team meeting that the team members had their own interpretation of the project’s level of ambition. In this setting, I observed that the top-down initiated innovation project underwent a “negotiation of meaning” process among the team members as they attempted to make collective sense of the work that they were to commence ([Weick, 1996, 2012](#)). See proposition 3. It was the external consultant who had to remind the team members of the top management’s version of the project’s purpose, goal and level of ambition. The consultant facilitated the project-related context and process, which enabled the team members to mentally adjust their actions and behaviors to create knowledge that aspired to meet the strategized purpose and goal of the project. This meaning negotiation in the team demonstrates the

importance of both giving a mandate to create new concepts and providing the correct skills for the process ([Brix, 2015](#); [O’Connor, 2008](#)). If the team’s collective sensemaking process was not facilitated by the external consultant, then the team may have delivered project results that were non-aligned with the project’s purpose and goal because they were already incrementalizing the project’s level of ambition during the first hour of collaboration. When relating this insight to my integrative framework, it demonstrates that just because the top management team’s ability to create a reasonable ‘context for strategic renewal’ and to define and set the boundaries for an ambitious innovation project is well executed, it does not imply that the team members’ interpretation of this work is in congruence. In other words, according to my integrative framework the *process* of the pre-project work was well executed by the top management team, but the top management team did not examine if the *content* (what had to be done) was interpreted correctly by the team when the project was commenced. This example illustrates the importance of studying not only the process (organizational learning) or the content (knowledge creation) of an innovation project but also the organization and the team setting as influential contexts. The combination of applying a context, a process and a content view on the data enabled me to attach importance to this insight – an insight that I have had for a long period of time but had not attached importance to before re-reading the field notes with the combined view in mind ([Burawoy, 1998](#); [Danneels, 2002](#)).

5.2. Organizational knowledge

My study determines that the *organizational knowledge* influences the individuals and the team in the knowledge creation process. However, the influence was not constant, as I expected it to be. Propositions 1 and 2 both claim that organizational knowledge influences team members more at the beginning than in the subsequent stages of an innovation project. When relating this insight to my integrative framework it creates an interesting awareness: The influence of organizational knowledge is not constant, but rather dynamic and decreasing when taking a team member perspective. Hence, the findings indicate that when team members recognize opportunities, they are more biased by organizational knowledge than when they develop these opportunities into concepts and business model designs. [Brix and Peters \(2015\)](#) indicate that such changes in attitude may occur in an innovation team because the team members’ readiness for change increases during the exploratory project work. When comparing this insight to [Weick \(1995a\)](#) and [Crossan et al. \(2011\)](#) it might demonstrate that the team members are already – at least mentally – enacting the innovation instead of seeing the organization’s existing work tasks and structures as ‘the correct way of doing things’. If this is the case, then propositions 1 and 2 lead to a fundamental question concerning the management of innovation that follows classical stage-gate and review systems: *Why is the potential value of new ideas evaluated and judged early in the innovation process when innovation team members are less biased by organizational knowledge later in the innovation process?* This perspective extends beyond [Lyles’s \(2014\)](#) focus on ‘asking the right question’. This I argue, because I could use the finding to develop a follow-up question to [Lyles’s](#) work: *“Are team members selecting the right – or the easiest answer?”* Hence, if team members are less biased and influenced by organizational knowledge two or three months into a project, then it could be an interesting implication to allow them to complete a second round of opportunity recognition and to work on developing these ideas instead. The outcome of such a pilot study could be that more novel opportunities are recognized, which could lead to the development of business model designs with high – or even higher – strategic potential than the traditional approach. More research is needed to support this claim and to further develop propositions 1 and 2.

5.3. Individual & group/team knowledge creation

In the context of *individual and group/team knowledge creation*, I find indications that are relevant to how the individual team member acted and behaved in a group/team setting (the *ba*) and how the team collaborated to recognize new opportunities. The findings discussed here pertain to propositions 4, 5 and 6. In relation to proposition 4, I find that the time spent on recognizing new opportunities decreased as time went by. This phenomenon can represent a situational example of groupthink (Janis, 1982), which often carries negative connotations in innovation studies. However, the phenomenon identified here may represent a positive aspect. It may be that the opportunity recognition process becomes more effective because the team members become attuned to their different ways of making and giving sense to each other while explaining new ideas and discussing their importance to the project (Gioia & Chittipeddi, 1991). Hence, I establish the following contribution concerning the effectiveness of knowledge creation processes when relating this insight to the literature on knowledge conversion: *When members in innovation teams have collectively interpreted and converted a few ideas into collective knowledge and when they have integrated this knowledge to make it relevant to the purpose and goal of the innovation project, they automatically create a more effective process* (Nonaka et al., 2006; Nonaka & von Krogh, 2009). This insight, based on proposition 4, also provides an empirical implication for the study of organizational learning according to the 4i framework of Crossan et al. (1999): *Processes of having a team interpret new knowledge and integrate this new knowledge into the purpose and goal of an innovation project are accelerated as team members learn to work together on knowledge creation and knowledge conversion*. This insight stresses that facilitators of learning, and not only barriers, occur when new knowledge is created between an individual team member and the other team members during opportunity recognition (Crossan et al., 2011). When relating this insight to my integrative framework, it illustrates another dynamic aspect worth noticing: *When the individual team members collaborate on knowledge creation and knowledge conversion, their approaches to sense-making and sensegiving is accelerated because they become faster in stimulating each others' interpretation of the phenomena they are working with, and thus each other's thought patterns* (Crossan et al., 1999; Gioia & Chittipeddi, 1991; Nonaka & von Krogh, 2009).

Another line of empirical evidence that contributes new knowledge to the study of organizational learning and knowledge creation on this level of analysis relates to how team members interact during knowledge creation. The extant theory explains that sensemaking or sensegiving approaches are used to create new knowledge among individuals (Argote, 2011; Gioia & Chittipeddi, 1991; Weick, 2012). Based on propositions 5 and 6, I advance these approaches to sensemaking and sensegiving. This point is argued because I determine how team members working on opportunity recognition engage in sensemaking and sensegiving 'types of dialogue' in practice. The identification of the four types of dialogue, i.e., 1) conversion, 2) diversion, 3) flow, or 4) rejection (or a combination of these), advance the existing literature on the exact manner in which knowledge is identified, created and developed. Hence, according to the knowledge conversion literature (Nonaka & von Krogh, 2009; Von Krogh et al., 2000), I identify four dialogue-based processes for how team members interact while creating and converting knowledge. In line with this advance, I find that team members utilize either opinion-driven or experience-driven attitudes and behaviors to negotiate meaning in relation to a new opportunity (proposition 6). This claim leads to an additional advance to research on knowledge creation (Brix, 2014; Rozenblit & Keil, 2002). This is argued because my study exemplifies how individual team members evaluate and justify the 'truth' of the opportunities that they recognize according to the purpose and goal of the innovation project (Nonaka & Takeuchi, 1995). Therefore, my study resonates with the argument by Nonaka and von Krogh (2009) that knowledge is regarded as a temporary truth: *'Beliefs are true to the extent that they can be justified*

by the individual organizational member at certain moments and using various mental models' (Nonaka & von Krogh, 2009; p.639). Hence, knowledge that is created during opportunity recognition is regarded as a temporary truth until the team begins to select opportunities for further development and thus further knowledge creation. This resonates with the argument provided in my integrative model: It is the group/team that creates knowledge for (strategic) renewal. But the knowledge the team members create represent their version of the 'truth' and their perspectives on integrating the new knowledge from the innovation project to the organization and to the purpose and goal of the project. When disseminated, the decision makers decide if the knowledge has to be reworked, used or put on hold/rejected, so in this part of the process the 'truth' about the opportunity (and its potential) is challenged and most likely subject to change.

To the extent that propositions 5 and 6 can be related to the literature on opportunity recognition, an interesting anomaly emerges from the analysis: *Entrepreneurial teams do not simply connect the dots between the market and technology. They negotiate meaning in regard to plural areas of application – and contents of application – before their knowledge is converted into a justified true belief and, hence, a new opportunity* (Baron, 2006; George, Parida, Lahti, & Wincent, 2016). However, a further investigation of this anomaly is only relevant if it can be assumed that opportunity recognition occurs in a public service organization as it would in a private enterprise or in other entrepreneurial settings.

5.4. Knowledge for strategic renewal

Contributions can also be found in the *knowledge for (strategic) renewal* part of the framework. Here, two perspectives emerge. The first concerns the team members' work on integrating the new knowledge into the purpose and goal of the project. The second perspective concerns the managerial approach to decision making, as proxied by the decision to use, to rework or not to use the new knowledge. First, the findings in proposition 7 reveal that some team members preferred to work on projects that were less uncertain and of lesser strategic ambition than expected by the top management. This is observable because the team members also developed business model designs that were of low and medium potential and not only of high potential. This tendency indicates that the initiation of an innovation project with high ambition for strategic renewal also leads to the creation of knowledge that is less ambitious but still relevant to the purpose and goal of the initiated project. This returns us to the discussion of sensemaking and sensegiving presented above (Gioia & Chittipeddi, 1991), in which the context (the *ba*) influences the justification of the truth and thus the potential value of the knowledge created (Nonaka & von Krogh, 2009). Consequently, I use this finding to echo the study by Brix and Peters (2015), who establish that a deliberate knowledge creation process in search of strategic renewal also determines knowledge that may lead to renewal on a non-strategic level. Concerning the literature on organizational learning, this multilevel outcome of an exploration process represents an empirical example that may lead back to the understanding of how the individual team member interprets and justifies new knowledge (Easterby-Smith & Lyles, 2014). In relation to my integrative model, this tendency may determine that team members link the new knowledge in their integrating processes to the organization in a manner that is different from how a decision maker with more organizational knowledge would do it. This could be because of different views on what is experienced as being important (Crossan et al., 2011). For example, if people who are not trained – or educated in strategic management are asked to deliver on projects that have high strategic ambition, they may find it hard to develop ideas that break out of their own lifeworld, which may not take place on a strategic level in the organization. This is exemplified because the team members in the innovation project consisted of line managers, organizational consultants and front-end staffers who did not act on a strategic level on a daily

basis.

Based on proposition 8, my study echoes the importance of creating a mutual interpretation of the strategic ambition of an innovation project on all managerial levels so that line managers do not short circuit or incrementalize ideas with large ambitions (Burton et al., 2015; O'Connor, 2008). This is argued because the findings indicate that the top management's pre-planning of the project had not considered the department head or the middle managers when defining and strategizing the project's purpose and goal. A justification for this decision can be made by exemplifying that the decision makers only decided to use one business model design with high strategic potential – and five business model designs with medium potential. In the organizational learning literature, however, this is a known phenomenon. Crossan and Berdrow (2003) explain that *“Even when ideas are well formulated in the exploration phase, they must not only compete with the well-established logic of exploitation; they must also compete with the investment, in both mindsets and assets, associated with exploitation”* (Crossan & Berdrow, 2003; pp.1102–1103). The choice not to use the new knowledge can also be interpreted as an act of “organizational mindlessness”, in which decision makers automatically use the “solutions of yesterday” to “solve the problems of tomorrow” (Langer, 1989). Here, it is regarded as the decision-making routine of relying on strong business cases and the acceptance of projects with low uncertainty on middle management levels. A final perspective on this level of analysis supports my integrative view of organizational learning and knowledge creation. I propose that a re-integrating process is initiated in the minds of decision makers when the team presents them with knowledge for strategic renewal. Decision makers may see alternative couplings between the business model designs and the organizational knowledge compared to team members with less strategic insight (Crossan et al., 1999; Nonaka & von Krogh, 2009). Hence, the move from the team context to the organizational sphere alters the ‘truth’ about the knowledge, and therefore, alternative justifications are needed – or the knowledge needs to be re-created (Nonaka & von Krogh, 2009). This may be the reason why the decision makers decided to wait and not to use the new knowledge (O'Connor, 2008). Alternatively, in general, it may explain why innovation teams are frequently asked to rework their knowledge before a decision for use or non-use is made (Crossan et al., 2011; Lyles, 2014). To paraphrase the words of Weick (2012), *“how can the team members know what decision makers think before the team members see what the decision makers say!”*

5.5. Limitations

The study has at least four limitations. First, I acknowledge that full papers could be written about the specific topics that are presented in my study. However, my ambition is to share and make public the rare data and insights stemming from three and a half years as a participant researcher. I assert that this is a reasonable decision since scholars such as Corley and Gioia (2011) stress that it is important to focus not only on extending and revising what is known, if the data material provides evidence for something that is revelatory and non-obvious. Burawoy's (1998) extended case method allows me to do both in the context of organizational learning and knowledge creation. Second, since it is ambitious to report on a full-scale innovation project in one manuscript, my contribution remains more exploratory and descriptive than explanatory. Therefore, the goal is not to test the validity of the new theoretical insights stemming from the case study or the use of my framework as theoretical lens. Third, I limit the literature review of organizational learning and knowledge creation to identifying the most important theoretical advances that are relevant for this study. For excellent literature reviews on organizational learning, see Huber (1991), Easterby-Smith, Crossan, and Nicolini (2000), and Argote (2012). For excellent reviews on knowledge creation theory, see Nonaka (1994), Nonaka and Toyama (2003), and Nonaka and von Krogh (2009). Fourth, I acknowledge that I utilize business concepts

such as strategic renewal, organizational learning and innovation in an empirical study of a public service organization. There are differences between the two. According to Røste and Miles (2005), private organizations work and compete under market conditions, whereas public service organizations work under bureaucratic or hybrid conditions in which local government policies, political rules and regulations, and conflicting pressures exist. Therefore, I acknowledge that the empirical evidence and the theoretical advances uncovered may relate only to public service organizations and not necessarily to private enterprises.

6. Conclusion

The study's key contribution is its conceptualization of an integrative framework for organizational learning and knowledge creation (Crossan et al., 2011; Easterby-Smith & Lyles, 2014). The integrative framework demonstrates how the two fields are different, how they complement each other, and how they are related. *First*, I propose the bold statement that knowledge creation processes on an individual level and a group/team level cannot be viewed as organizational learning unless a formal decision to use, rework or reject the new knowledge is made. Hence, both individual employees as well as members of teams in innovation projects can learn without their new knowledge reaches an organizational awareness where it can be used for (strategic) renewal. In line with this my empirical evidence demonstrate that much more team knowledge creation occurred in the case organization compared to the amount of knowledge that was presented to the decision makers to enable organizational learning: The team created 33 concepts whereas the decision makers were only presented with 14 of them that were specially selected and further developed. *Second*, I establish that the “decision to rework knowledge for (strategic) renewal” represents the missing link between organizational learning and knowledge creation. In this setting, decision makers have to relate the knowledge presented by the team to the context in which the knowledge is going to be used. New interpretations of the knowledge may be stimulated during this encounter. In organizational learning theory, this leads to a knowledge “re-integrating process” (Crossan et al., 1999, 2011), whereas in knowledge creation theory, it leads to a knowledge “re-conversion process” (Nonaka & von Krogh, 2009). Hence, here we find an example of how the two fields have developed in parallel creating their own constructs explaining the exact same situation. In addition to this perspective, the integrative framework enables me to provide arguments for why “decisions not to use new knowledge” can represent a source of organizational learning (Hernes & Irgens, 2012; Weick, 1995a). This point is argued because learning does not require change, if the use of new knowledge would leave the organization in an inferior situation (Hernes & Irgens, 2012; Weick, 1996). This implies that organizational learning does not necessarily requires a move from exploration to exploitation (March, 1991). In line with this view, my study motivates an important temporal dimension of knowledge also noticed by O'Connor (2008) and Brix (2014): decision makers may wait deliberately to implement new knowledge because users are not expected to be ready to adopt the changes (O'Connor, 2008). *Third*, the two literatures are related because they both have a strong emphasis on how the context (the *ba*) in which learning/knowledge creation occurs influences the individuals working in it (Brusoni & Rosenkranz, 2014; Crossan & Berdrow, 2003; Nonaka and von Krogh, 2009 Nonaka & von Krogh, 2009; Von Krogh et al., 2012). *Finally*, my endeavor to respond to the call for research on integrating the two paradigms by Crossan et al. (2011), Lyles (2014) and Easterby-Smith and Lyles (2014) has led to the novel insights and theoretical advances presented above. I call for further research to either develop or challenge my claims, and to further develop the propositions stemming from my empirical work. These could also be beneficial to study in adjacent literatures such as opportunity recognition, innovation management and organizational design. Nonetheless, I hope that my study will motivate a constructive discussion in and

between the two literatures.

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References

- Antonacopoulou, E. P. (2007). Actionable knowledge. In S. Clegg, & J. Bailey (Eds.), *International encyclopaedia of organization studies* (pp. 14–17). London: SAGE.
- Argote, L. (2011). Organizational learning research: Past, present and future. *Management Learning*, 42(4), 439–446.
- Argote, L. (2012). *Organizational learning: Creating, retaining and transferring knowledge*. Springer Science & Business Media.
- Argyris, C., & Schön, D. A. (1978). *Organizational learning: A theory of action perspective*, Vol. 173. Reading, MA: Addison-Wesley.
- Argyris, C. (2009). *On organizational learning* (2nd ed.). USA: Blackwell Publishing.
- Baron, R. A. (2006). Opportunity recognition as pattern recognition: How entrepreneurs connect the dots to identify new business opportunities. *The Academy of Management Perspectives*, 20(1), 104–119.
- Biggs, J., & Tang, C. (2009). *Teaching for quality learning at university* Society for research into higher education (5th ed.). England: McGraw Hill.
- Brady, T., & Davies, A. (2004). Building project capabilities: From exploratory to exploitative learning. *Organization Studies*, 25(9), 1601–1621.
- Brix, J., & Peters, L. S. (2015). Exploring an innovation project as a source of change in organization design. *Journal of Organization Design*, 4(1), 29–43.
- Brix, J. (2014). Improving individual knowledge construction and re-construction in the context of radical innovation. *International Journal of Innovation and Learning*, 15(2), 192–209.
- Brix, J. (2015). Fail forward: Mitigating failure in energy research and innovation. *Energy Research & Social Science*, 7, 66–77.
- Brusoni, S., & Rosenkranz, N. A. (2014). Reading between the lines: Learning as a process between organizational context and individuals' proclivities. *European Management Journal*, 32(1), 147–154.
- Burawoy, M. (1998). The extended case method. *Sociological Theory*, 16(1), 4–33.
- Burton, R. M., Obel, B., & Håkansson, D. D. (2015). *Organizational design: A step-by-step approach*. Cambridge: Cambridge University Press.
- Choo, C. W. (1998). *The knowing organization: How organizations use information to construct meaning, create knowledge, and make decisions*. New York: Oxford University Press.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 128–152.
- Colquitt, J. A., & Zapata-Phelan, C. P. (2007). Trends in theory building and theory testing: A five-decade study of the Academy of Management Journal. *Academy of Management Journal*, 50(6), 1281–1303.
- Corley, K. G., & Gioia, D. A. (2011). Building theory about theory building: What constitutes a theoretical contribution? *Academy of Management Review*, 36(1), 12–32.
- Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of Management Studies*, 47(6), 1154–1191.
- Crossan, M. M., & Berdrow, I. (2003). Organizational learning and strategic renewal. *Strategic Management Journal*, 24(11), 1087–1105.
- Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review*, 24(3), 522–537.
- Crossan, M. M., Maurer, C. C., & White, R. E. (2011). Reflections on the 2009 AMR decade award: Do we have a theory of organizational learning? *Academy of Management Review*, 36(3), 446–460.
- Curado, C. (2006). Organisational learning and organisational design. *The Learning Organization*, 13(1), 25–48.
- Cyert, R. M., & March, J. G. (1963). *A behavioral theory of the firm*. Englewood Cliffs, NJ: Prentice-Hall.
- Danneels, E. (2002). The dynamics of product innovation and firm competences. *Strategic Management Journal*, 23(12), 1095–1121.
- Easterby-Smith, M., & Lyles, M. (2014). The evolving field of organizational learning and knowledge management. In M. Easterby-Smith, & M. Lyles (Eds.), *The Blackwell handbook of organizational learning and knowledge management* (2nd ed.). USA: Blackwell Publishing.
- Easterby-Smith, M., Crossan, M., & Nicolini, D. (2000). Organizational learning: Debates past, present and future. *Journal of Management Studies*, 37(6), 783–796.
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550.
- Felin, T., & Hesterly, W. S. (2007). The knowledge-based view, nested heterogeneity, and new value creation: Philosophical considerations on the locus of knowledge. *Academy of Management Review*, 32(1), 195–218.
- George, N. M., Parida, V., Lahti, T., & Wincent, J. (2016). A systematic literature review of entrepreneurial opportunity recognition: Insights on influencing factors. *International Entrepreneurship and Management Journal*, 12(2), 309–350.
- Gioia, D. A., & Chittipeddi, K. (1991). Sensemaking and sensegiving in strategic change initiation. *Strategic Management Journal*, 12(6), 433–448.
- Gioia, D. A., & Pitre, E. (1990). Multiparadigm perspectives on theory building. *Academy of Management Review*, 15(4), 584–602.
- Guest, D. E. (2011). Human resource management and performance: Still searching for some answers. *Human Resource Management Journal*, 21(1), 3–13.
- Hernes, T., & Irgens, E. J. (2012). Keeping things mindfully on track: Organizational learning under continuity. *Management Learning*, 44(3), 254–266.
- Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science*, 2(1), 88–115.
- Huber, G. P. (2011). Organizations: Theory, design, future. In Z. Sheldon (Vol. Ed.), *The APA handbook of industrial and organizational psychology: Building and developing the organization*. Vol. 1, (pp. 117–160). Washington, DC: American Psychological Association.
- Jakobsen, H. S. (2015). *The art of planning and executing workshops [in Danish]*. Aarhus, Denmark: Invencis Publishing.
- Janis, I. L. (1982). *Groupthink: Psychological studies of policy decisions and fiascoes*, Vol. 349. Boston: Houghton Mifflin.
- Jensen, M. B., Johnson, B., Lorenz, E., & Lundvall, B. (2007). Forms of knowledge and modes of innovation. *Research Policy*, 36(5), 680–693.
- Kao, S. C., Wu, C., & Su, P. C. (2011). Which mode is better for knowledge creation? *Management Decision*, 49(7), 1037–1060.
- Langer, E. J. (1989). Minding matters: The consequences of mindlessness-mindfulness. *Advances in Experimental Social Psychology*, 22(12), 137–173.
- Langley, A. (1999). Strategies for theorizing from process data. *The Academy of Management Review*, 24(4), 691–710.
- Lyles, M., & Easterby-Smith, M. (2007). Organizational learning and knowledge management: Agendas for future research. In M. Easterby-Smith, & M. Lyles (Eds.), *The Blackwell handbook of organizational learning and knowledge management* (pp. 639–652). USA: Blackwell Publishing.
- Lyles, M. A. (2014). Organizational Learning, knowledge creation, problem formulation and innovation in messy problems. *European Management Journal*, 32(1), 132–136.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford University Press.
- Nonaka, I., & Toyama, R. (2003). The knowledge-creating theory revisited: Knowledge creation as a synthesizing process. *Knowledge Management Research & Practice*, 1(1), 2–10.
- Nonaka, I., & von Krogh, G. (2009). Perspective-tacit knowledge and knowledge conversion: Controversy and advancement in organizational knowledge creation theory. *Organization Science*, 20(3), 635–652.
- Nonaka, I., Von Krogh, G., & Voelpel, S. (2006). Organizational knowledge creation theory: Evolutionary paths and future advances. *Organization Studies*, 27(8), 1179–1208.
- Nonaka, I., Kodama, M., Hirose, A., & Kohlbacher, F. (2014). Dynamic fractal organizations for promoting knowledge-based transformation—A new paradigm for organizational theory. *European Management Journal*, 32(1), 137–146.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37.
- O'Connor, G. C., & Rice, M. P. (2013). A comprehensive model of uncertainty associated with radical innovation. *Journal of Product Innovation Management*, 30(S1), 2–18.
- O'Connor, G. C. (2008). Major innovation as a dynamic capability: A systems approach. *Journal of Product Innovation Management*, 25(4), 313–330.
- OECD (2005). *Oslo manual—Guidelines for collecting and interpreting innovation data*. Organisation for Economic Cooperation and Development, OECD.
- Peronard, J.-P., & Brix, J. (forthcoming). Sensemaking in collaborative networks: Creating and balancing activities in open business models. *International Journal of Entrepreneurship and Innovation Management*, 00(0), 000–000.
- Røste, R., & Miles, I. (2005). Differences between public and private sector innovation. In T. Halvorsen, J. Hauknes, I. Miles, & R. Røste (Eds.), *Innovation in the public sector: On the differences between public and private sector innovation* Publin Report No. D9.
- Rashman, L., Withers, E., & Hartley, J. (2009). Organizational learning and knowledge in public service organizations: A systematic review of the literature. *International Journal of Management Reviews*, 11(4), 463–494.
- Rosenkopf, L., & McGrath, P. (2011). Advancing the conceptualization and operationalization of novelty in organizational research. *Organization Science*, 22(5), 1297–1311.
- Rozenblit, L., & Keil, F. (2002). The misunderstood limits of folk science: An illusion of explanatory depth. *Cognitive Science*, 26(5), 521–562.
- Tushman, M., Smith, W. K., Wood, R. C., Westerman, G., & O'Reilly, C. (2010). Organizational designs and innovation streams. *Industrial and Corporate Change*, 19(5), 1331–1366.
- Vera, D., & Crossan, M. (2007). Organizational learning and knowledge management: Toward an integrative framework. In M. Easterby-Smith, & M. A. Lyles (Eds.), *Handbook of organizational learning and knowledge management* (4th ed.). USA: Blackwell Publishing.

- Von Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling knowledge creation: How to unlock the mystery of tacit knowledge and release the power of innovation*. Oxford: Oxford University Press.
- Von Krogh, G., Nonaka, I., & Rechsteiner, L. (2012). Leadership in organizational knowledge creation: A review and framework. *Journal of Management Studies*, 49(1), 240–277.
- Weick, K. E., & Sutcliffe, K. M. (2006). Mindfulness and the quality of organizational attention. *Organization Science*, 17(4), 514–524.
- Weick, K. E. (1995a). *Sensemaking in organizations*, Vol. 3. London: Sage Publications.
- Weick, K. E. (1995b). What theory is not, theorizing is. *Administrative Science Quarterly*, 40(3), 385–390.
- Weick, K. E. (1996). The role of renewal in organizational learning. *International Journal of Technology Management*, 11(7–8), 738–746.
- Weick, K. E. (2012). *Making sense of the organization, volume 2: The impermanent organization*, Vol. 2. John Wiley & Sons.
- Yin, R. K. (2013). *Case study research: Design and methods*. Sage publications.