

Building capacity for sustainable innovation

A field study of the transition from exploitation to exploration and back again

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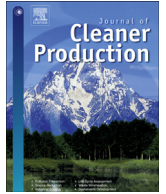
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Building capacity for sustainable innovation: A field study of the transition from exploitation to exploration and back again

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ABSTRACT

In this study, I investigate how a European company with a 50-year history creating and producing polymer products completed an entire innovation project that was being implemented as part of a new, sustainability-oriented strategy. The aim of the new corporate strategy was twofold. The first aim was to recognize new sustainable opportunities and to translate these opportunities into concrete products or services that could be commercialized. The second aim was to build the organization's innovation capacity such that organizational members would be able to better manage the difficult transitions they experienced when switching between activities related to exploration and exploitation. Organizational learning theory was applied as a theoretical lens, and a qualitative multimethod approach was utilized to build the case that served as the empirical foundation for the study. Five propositions that provide new and more granular perspectives to the study's theoretical background were developed. Additionally, a new model was proposed that can be used to explain how organizational members' innovation capacity can be developed via feedforward and feedback when implementing a sustainability-oriented strategy.

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1. Introduction

The ability to learn has long been recognized as an imperative characteristic that allows organizations to remain continuously relevant (March, 1991; Huber, 2004; Argote, 2012). Such relevancy is also echoed in studies of sustainability and cleaner production (e.g., van Hoff, 2014; Nicolletti et al., 2019) – especially in the context of strategic sustainability behavior and innovation practices (Klewitz and Hansen, 2014). Theoretically, organizational learning can be divided into two types of activities that must be prioritized and implemented: *exploration* and *exploitation* (March, 1991; O'Reilly and Tushman, 2013). Exploration consists of activities such as searching for new opportunities and creating new knowledge whereas exploitation relates to activities that rely on the creation of value by utilizing existing knowledge and old certainties (Smith and Tushman, 2005; O'Cass et al., 2014). In this literature, organizations that are able to strike a balance between exploration and exploitation are theoretically referred to as being *ambidextrous* (Van Kleef and Roome, 2007; Simsek, 2009). The proactive search to become an ambidextrous organization is regarded as imperative. One argument is that continuous adaptation and innovation are

required to respond to the changes imposed by, for example, phenomena related to climate change and/or resource scarcity (van Hoff, 2014; Ortiz-Avram et al., 2018; Nicolletti et al., 2019). Another argument is that organizations that are capable of striking a relevant balance between exploration and exploitation obtain better performance compared to organizations that cannot strike such balance (Lubatkin et al., 2006; Raisch et al., 2009; Junni et al., 2013). Hence, the organizational learning literature can assist in explaining how sustainable strategies can be implemented, both as part of, for example, CSR integration in organizational practices and as a performance-oriented approach to short- and long-term survival (Van Kleef and Roome, 2007; Ortiz-Avram et al., 2018). However, the problem is that organizations and their members are often good at either exploration or exploitation, but not both. More specifically, organizational members find it difficult to move from the one type of activity to the other as well as to transition the new knowledge created in exploration processes towards exploitation (March, 1991; Gibson and Birkinshaw, 2004; Brix, 2019a). In the context of sustainability and cleaner production, Klewitz and Hansen (2014) propose that collaboration with external actors in the innovation process can increase organizations' innovation capacity. Scholars Vieira and Amaral (2016) find that an entrenched organizational culture, a lack of certain competencies and unclear communication represent inhibiting barriers to the exploitation of

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new opportunities, and Nicolletti et al. (2019) complement these finding by arguing for the importance of building new organizational routines. These studies demonstrate that it is imperative to investigate how organizations build their ability to innovate with the specific aim of realizing sustainability-oriented strategies (van Hoof, 2014).

The purpose of this study is to investigate how an organization and its members seek to build their capacity to create a local balance between exploration and exploitation with a dedicated focus on sustainable innovation. The research questions guiding the study are as follows: What barriers and opportunities can be identified when organizational members transition between modes of exploration and exploitation, and how can these findings be used to advance the current understanding of the nexus between sustainability-oriented strategy implementation and organizational learning?

To provide an answer to these research questions, I had the opportunity to study the implementation of an entire sustainability-oriented innovation project from its initiation to the commercialization of new products at a European polymer manufacturer. My role as researcher was that of a participant observer (Kristiansen and Krogstrup, 2015) as I was allowed to study the organizational professionals during their collaboration. The data from my field research (December 2013–January 2017) are used to build the case presented in this manuscript (Eisenhardt, 1989; Edmondson and McManus, 2007; Yin, 2009). The case is built using a multimethod research approach consisting of ‘participant observation’ (Kristiansen and Krogstrup, 2015), ‘semi-structured interviews’ (Kvale and Brinkmann, 2009), and ‘document analysis’ (Justesen and Mik-Meyer, 2010). The key contribution of my study are five new propositions related to the study’s theoretical background as well as a new model that illustrates the nuances of ‘how’ and ‘when’ innovation capacity building processes occur as part of the realization of a sustainability-oriented strategy (Vieira and Amaral, 2016; Ortiz-Avram et al., 2018; Nicolletti et al., 2019; Brix, 2019b).

2. Theoretical background

Inspired by van Hoof (2014) and Nicolletti et al. (2019), this study is based on organizational learning theory with the goal of extending the literature toward the body of knowledge related to the research on sustainability and cleaner production. From an organizational learning perspective, I begin this section by defining the fuzzy constructs of *exploration* and *exploitation*. The premise is that bringing clarity to these constructs represents the foundation for understanding how the activities related to the implementation of sustainability-oriented strategies and cleaner production can be understood as approaches to organizational learning. I then introduce the organizational ambidexterity literature. Finally, I briefly present the multilevel theories of organizational learning. The argument for introducing the multilevel theories in studying the processes of exploration and exploitation is that, later in the study, the multilevel literature will enable me to structure both the content and process data into three units of analysis: the individual level, the group/team level, and the organizational level (Crossan et al., 1999, 2011; Brix, 2017; Morland et al., 2019). During the introduction to the theoretical background, I will relate the literature to existing studies on sustainability and cleaner production to identify the clear linkages that already exist between the two bodies of knowledge.

2.1. Exploration and exploitation in organizational learning

According to March (1991), activities related to *exploration*

include conducting experiments, searching for new opportunities and seeking variation when intentionally working on creating new knowledge. Activities related to *exploitation* include projects that seek to improve existing products and their features or projects related to the creation of more sustainable production processes; the reduction of CO₂ emissions based on logistics and, generally, obtaining cleaner production (van Hoff, 2014; Ortiz-Avram et al., 2018; Nicolletti et al., 2019). Fig. 1 illustrates an example of the exploration – exploitation continuum and their main differences.

Activities related to *exploration*, such as initiating new collaborations with external organizations or translating new policies into product and/or service opportunities, can be diffuse and have long time horizons. The argument is that such activities imply ‘more than a technological change’ (Vieira and Amaral, 2016, p.13) to organizations and their members (van Hoff, 2014). Exploitation activities are therefore more precise because many certainties are known beforehand. However, according to March (1991) and Gaim and Wählin (2016), it is difficult for many organizations and their members to transition from exploration to exploitation. Vieira and Amaral (2016) provide an intriguing study that identifies a range of barriers to implement cleaner production in organizations. Some of the important barriers identified include the need for defining new roles and responsibilities for organizational members and understanding how new technologies integrate with existing technological platforms (Ibid.). Another argument is that the organization and its members are used to navigate situations that are often *either* exploitative *or* explorative. Brix (2019b, p.13) argues that “A potential cause of this *either/or* problem is that ‘doing things better’ (*exploitation*) leads to fewer struggles and less opposition from organizational members while ‘doing better things’ (*exploration*) attracts much more attention and resistance”. Many dilemmas arise when seeking to strike a balance between exploration and exploitation, and the organizational ambidexterity literature suggests the following.

2.2. Organizational ambidexterity

There are two competing views on how to create balance between exploration and exploitation: the *differentiation view* and the *integration view*. Scholars promoting the *differentiation view* argue that exploration and exploitation represent incompatible activities that compete for the same resources (Smith and Tushman, 2005; O’Reilly and Tushman, 2013). The solution presented in this line of research is to separate the activities across different units, where one unit is responsible for the activities associated with exploration, e.g., an R&D department, and where the other units are responsible for production, sales and aftermarket services (Simsek et al., 2009). Proponents of the *integration view*, such as Gibson and Birkinshaw (2004), Wang and Rafiq (2014) and Caniëls et al. (2017), argue that the processes can coexist within the same unit and that there are complementary benefits between the two approaches to learning and knowledge creation (Brix, 2019b). This study deliberately adopts the integration view based on that premise. In relation to studies of cleaner production and organizational learning, the integration view represents a relevant avenue. The argument is that social interactions are emphasized as an important mechanism for the creation of awareness and collective understanding of how difficult problems such as ‘sustainability’ and ‘cleaner production’ can be translated from strategic intents into organizational practices (van Hoff, 2014; Vieira and Amaral, 2016; Nicolletti et al., 2019). Studies of the integration view are also identified with the label of ‘contextual ambidexterity’. For further insights into different typologies and extended discussions thereof, please see Simsek et al. (2009) and, more recently, Brix (2019a).

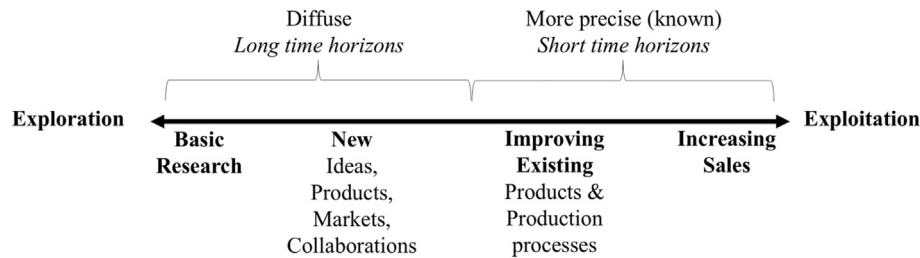


Fig. 1. Illustration of differences between exploration and exploitation
Source: Author's development.

2.2.1. Contextual ambidexterity

Gibson and Birkinshaw (2004, p. 209) define contextual ambidexterity as “the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit” in which there are “(...) processes or systems that enable and encourage individuals to make their own judgments about how to divide their time between conflicting demands” (Gibson and Birkinshaw, 2004, p.210). Based on this definition, a key focus of the contextual ambidexterity approach is therefore directed at the behavioral and social means of managers and employees in organizations to prioritize and integrate exploration and exploitation activities. Please recall that such perspective was emphasized by van Hoof (2014), Vieira and Amaral (2016) and Nicolletti et al. (2019) as an important mechanism in the implementation of sustainable strategies. To enable the creation of a contextual ambidextrous organization, Andriopoulos and Lewis (2009, p. 698) argue that “supportive social processes (e.g., socialization and recognition practices), culture, and interpersonal relations help actors throughout the firm think and act ambidextrously”. Although Andriopoulos and Lewis (2009) stress the importance of the ‘actors’ within the firm, it is important to stress that the study of contextual ambidexterity entails a minimum of two units of analysis. The first unit of analysis is the organizational context in which the ambidexterity dilemma is manifested, and the second unit of analysis is individual employees’ judgements on how to best divide their work between the conflicting requirements of exploration and exploitation (Wang and Rafiq, 2014; Havermans et al., 2015). The organizational context must be based on: an interaction of stretch, discipline and trust (Gibson and Birkinshaw, 2004, p. 214) if the employees’ individual ‘switching’ between tasks is to be promoted and effectuated (Raisch et al., 2009), which could imply that the entire organization must rethink its approach to innovation at the process and organizational levels if the employees are given the mandate to— and are expected to —behave in ways that can translate sustainable strategies into organizational practices (Klewitz and Hansen, 2014). On the individual level, the switching between exploration and exploitation tasks can be performed as sequences or even short phases of exploration (e.g., minutes or hours) before the employees must ‘return’ to daily operations (Raisch et al., 2009; Brix, 2019a). The argument is that contextual ambidexterity enables a high degree of efficiency in existing work flows since the individual employee can decide to break out of an existing routine and explore whether the new work flow variations will make their job more efficient or reduce the existing amount of waste (Klewitz and Hansen, 2014).

However, implementing contextual ambidexterity in an established organization is not problem-free. According to Haibin and Atuahene-Gima (2007, p. 6), “significant resources and managerial efforts need to be invested up front to develop the superior capabilities for reining the two opposing forces (...)”. Following their argument, scholars emphasize that successful implementation requires the ‘mitigation of resource conflicts’, ‘suitable leadership styles’, and

‘supportive incentive structures’ (Wang and Rafiq, 2014; De Clercq et al., 2014; O’Cass et al., 2014; Havermans et al. 2015). Recently, Brix (2019b) introduced the ‘innovation capacity building’ framework as a conceptual solution for processing the implementation of contextual ambidexterity in established organizations. Innovation capacity building is “a process in which an organizational context is created that, via managerial feedback, supports the use and development of the employees’ knowledge, skills and decision-making capabilities in such a way that the employees are empowered to decide when to switch between activities pertaining to exploration and exploitation” (Brix, 2019b, p21). Therefore, the innovation capacity building framework can be applied to determine how the roles of managers and employees change when implementing sustainable-oriented strategies (Klewitz and Hansen, 2014; Vieira and Amaral, 2016; Nicolletti et al., 2019). The role of the management in innovation capacity building is both to provide opportunity for ‘direct capacity building’ and to enable the ‘indirect capacity building’ of employees. Direct capacity building concerns formal professionalization initiatives such as membership in professional network associations and competence development courses (Krogstrup, 2016). Another important management role is that of providing employees with feedback concerning their ‘learning by doing’ when the employees switch between activities related to exploration and exploitation, i.e., when they engage in indirect capacity building (Brix, 2019b).

To summarize, the premise of contextual ambidexterity is that it is possible to create an organizational context in which activities pertaining to both exploration and exploitation can co-exist. The theoretical argument is that the capacity of management and employees to process activities within both domains can be built, just as their capacity to transition new knowledge from exploration towards exploitation can be built.

2.3. Organizational learning as a multilevel learning phenomenon

To enable the creation of a more nuanced view of the study of contextual ambidexterity, the literature concerning organizational learning as a multilevel phenomenon is introduced to the study (Crossan et al., 1999; Brix, 2017; Morland et al., 2019). The solution provided by this literature is twofold. First, it separates organizational learning processes into three levels of analysis: a) the individual level, b) the group/team level, and b) the organizational level (Crossan et al., 1999). Second, this literature employs four micro-processes to explain how knowledge related to exploration and exploitation processes flows across the three levels.

The four micro-processes are *intuiting*, *interpreting*, *integrating*, and *institutionalizing*. See Table 1 for their concrete definitions. Together, these micro-processes are referred to as the 4i-framework (Crossan et al., 1999, 2011). The division of the micro-processes across the three levels is as follows: Intuiting and interpreting happen at the individual level, interpreting and integrating

Table 1
Three levels of analysis and the four micro-processes related to each level.

Level of analysis	Micro-processes	Definitions of micro-processes
Individual level	Intuiting and Interpreting	Intuiting is the preconscious recognition of the pattern and/or possibilities inherent in a personal stream of experience. Interpreting is the explanation, through words and/or actions, of an insight or idea to oneself and to others.
Group/team level	Interpreting and Integrating	Integrating is the process of developing shared understanding among individuals and of taking coordinated action through mutual adjustment.
Organizational level	Integrating and Institutionalizing	Institutionalizing is the process of ensuring that routinized actions occur. Tasks are defined, actions specified, and organizational mechanisms put in place to ensure that certain actions occur. (Crossan et al., 1999, p.525).

Source: Inspired by Crossan et al. (1999).

happen at the group/team level, and integrating and institutionalizing happen at the organizational level. The four micro-processes are well established in the multilevel organizational learning literature, and recent publications emphasize the important role of the sensemaking and sensegiving processes that occur when employees in group/team constellations interact to create new knowledge and translate such knowledge into value for the organization (Brix, 2017; Morland et al., 2019). By proposing the integration of the literature of contextual ambidexterity with the three levels of analysis and the four micro-processes from the multilevel models, the ambition of the current study is to enable a more detailed analysis and discussion of how exploration and exploitation come about in the context of sustainability and cleaner production (van Hoof, 2014; Klewitz and Hansen, 2014; Ortiz-Avram et al., 2018; Brix, 2019a; Sætre and Nguyen, 2019).

3. Research method

Inspired by Nicolletti et al. (2019), I utilize a qualitative single case study to create new empirical knowledge that can be used to answer the explorative research question guiding the study (Eisenhardt, 1989; Yin, 2009). My ambition with this research approach is to contribute using process theories as provisional explanations (Edmonson and McManus, 2007) by qualitatively determining how transitions between exploration and exploitation can take place when an organization implements a sustainability-oriented strategy (van Hoof, 2014; Nicolletti et al., 2019). The case company is a European manufacturing company that specializes in polymer foam products. The products are sold B2B and B2C. Examples of the products sold B2B are tailor-made sound insulation materials that minimize noise in structures such as cabins and wind turbines. Examples of the products sold B2C are disposable polymer wash cloths.

3.1. Qualifying the sample

The case organization was founded in the 1970s primarily based on the sale of disposable washing sponges. Since then, the organization has expanded its product range and entered new markets. According to the chief sales officer, this product expansion and the penetration of new markets did not occur as a result of proactive and deliberate strategies. Rather, the organization's innovations were often created reactively. In 2013, a new corporate strategy was launched: 'Excellence in innovation for a sustainable future'. The implication of the new sustainability-oriented strategy was that the managers and the employees had to begin working proactively with innovation processes. Especially needed was for them to build their capacity to explore new sustainable opportunities and to transition these opportunities into value-creating activities or outputs that could be exploited. In other words, the case organization wanted to change strategy from being reactive to being innovation-based (Klewitz and Hansen, 2014). Because the

organization wanted to adopt a proactive, systematic approach to innovation management, the leadership contracted with an experienced, external innovation consultant. In 2013, the case organization thus decided to collaborate with an external agent to build their innovation capacity, a recommendation that was later proposed in this journal by Klewitz and Hansen (2014) as being a potentially beneficial decision. An innovation project was defined by the leadership, and a team was created that consisted of the R&D director, the chief sales officer, and an experienced production worker. The external consultant was given a twofold task. The primary role of the external consultant was to manage the innovation project for the case organization. An equally important role was given to him as he was also contracted to provide the team with hands-on training and reflective practice during the innovation project; thus, the team received innovation training in the form of 'learning by doing'.

The present case study illustrates what happens when an organization initiates a sustainability-oriented strategy (Nicolletti et al., 2019) to reduce company internal barriers to innovation (Vieira and Amaral, 2016) and does so by seeking to collaborate with external agents (Klewitz and Hansen, 2014). From this perspective, it is argued that the case organization qualifies as a relevant arena to address the study's research question.

3.2. Data

3.2.1. Data access

I was invited to participate in the project via the external consultant who had previously been a close colleague of mine. The external consultant was aware of my research interest in organizational learning and capacity building, and he knew that access to real world data often is difficult to obtain for people who are employed at a university. The external consultant took initiative to propose to the case organization that I could follow the innovation project as a participant observer (Kristiansen and Krogstrup, 2015). A dialogue was initiated, and we agreed that I would be allowed to observe the innovation process and engage in dialogue with the professionals during my participation. The case organization accepted the proposal, and I was allowed access to the field.

3.2.2. Data collection

I base the study on a qualitative multimethod approach by combining participant observation (Kristiansen and Krogstrup, 2015), semi-structured interviews (Kvale and Brinkmann, 2009) and analysis of sales brochures (Justesen and Mik-Meyer, 2010). This multimethod approach enabled me to document 1) the actions and behaviors of the team members participating in the innovation project, 2) the conversations between the team members and the external consultant, and 3) the output of the innovation project. Inspired by Langley's (1999) recommendation, a mapping of my field research is briefly described below (See Fig. 2).

I was allowed to follow the organizational team and the external

consultant in the exploration phase of the innovation project from December 2013 to March 2014. I participated in two 3-h meetings in December, a 4-h opportunity-recognition workshop in January 2014, and, finally, I was allowed participate in a 2-h opportunity-elaboration workshop in March 2014. Thereafter, to secure the time lag between the exploration phase and the case organization's exploitation phase, I did not collect data again before November 2016. This time lag enabled me to investigate if any outputs or outcomes had been created because of the project (Guest, 2011). To gain access to this information, I conducted a semi-structured interview with the chief sales officer in November 2016, and in January 2017, I downloaded the newly published product catalogue. The document analysis of the product catalogue made it possible for me to investigate if any of the opportunities identified in the exploration phase of the innovation project had been elaborated into commercialized products.

3.2.3. Data types

The data created were as follows: 45 pages of field notes including short summaries of unstructured interviews, 4:45 h of audio recordings from the workshops, 1 semi-structured interview with the chief sales officer, and product catalogues. Hence, I reported on real time process data, and I was able to document whether and how the content created in the exploration process ended up being exploited.

3.2.4. Data analysis

I utilize deductive content analysis to analyze the data (Elo and Kyngäs, 2008). Elo and Kyngäs (2008) divide deductive content analysis into four phases: 1) developing an analysis matrix, 2) data gathering by content, 3) comparison of the findings with earlier studies, and 4) reporting the findings. The tri-partition of the individual, group/team and organizational levels of analysis from the organizational learning theory was used as a matrix for data analysis. I could categorize the data into the relevant levels of analysis by using the 4i micro-processes during this coding and categorization (Crossan et al., 1999; Brix, 2017; Morland et al., 2019). The data coded with the 4i micro-processes are illustrated explicitly in the findings section. Some of the codes had an amount of data that could be used to create sub-categories 4.2.1, 4.2.2 and 4.2.3 that were included to further unfold the findings and to illustrate the richness of the data. The themes presented in these subsections were included because they were all relevant to the study's first

research question, which as a reminder is: *What barriers and opportunities can be identified when organizational members transition between modes of exploration and exploitation?* Hence, inspired by Vieira and Amaral (2016), the data analysis seeks to identify both facilitators and barriers in the process of building innovation capacity in the case organization.

4. Findings

This section begins by first presenting the results pertaining to the micro-processes on the organizational level and then on the group/team and individual levels. Finally, I present the output of the innovation capacity building process as proxied by the ideas, opportunities and products that were finally commercialized. When possible, the micro-processes are indicated as [interpreted] in the text to demonstrate how the data were coded during the data analysis. To recall the definitions of the different micro-processes, please refer to Table 1 in section 2.3, 'Organizational learning as a multilevel phenomenon to learning'.

4.1. Micro processes on the organizational level

The purpose of the innovation project was to build the team members' ability to explore new opportunities, and the goal of the project was to create and develop concepts for new, sustainable polymer-based products. One of the managerial ambitions of the innovation projects was also to identify potential new products based on the large amount of excess material stemming from production so the amount of waste could be reduced and turned into value. With this dual-focused innovation project defined, the leadership formed an innovation team and informed the team about the innovation project and the learning process related to it. This was done to create a shared understanding of the project so the team would be able to take the necessary actions accordingly [Integrating]. The team members were 1) the R&D director, 2) the chief sales officer, and 3) an experienced production worker. The team had collaborated before on innovation projects but not in a structured way. The leadership provided the innovation team with resources and the mandate to recognize and develop new product opportunities [institutionalizing]. The innovation project was initiated December 2013, and the collaboration with the external consultant lasted until March 2014.

During the first meeting, the following conversations took place

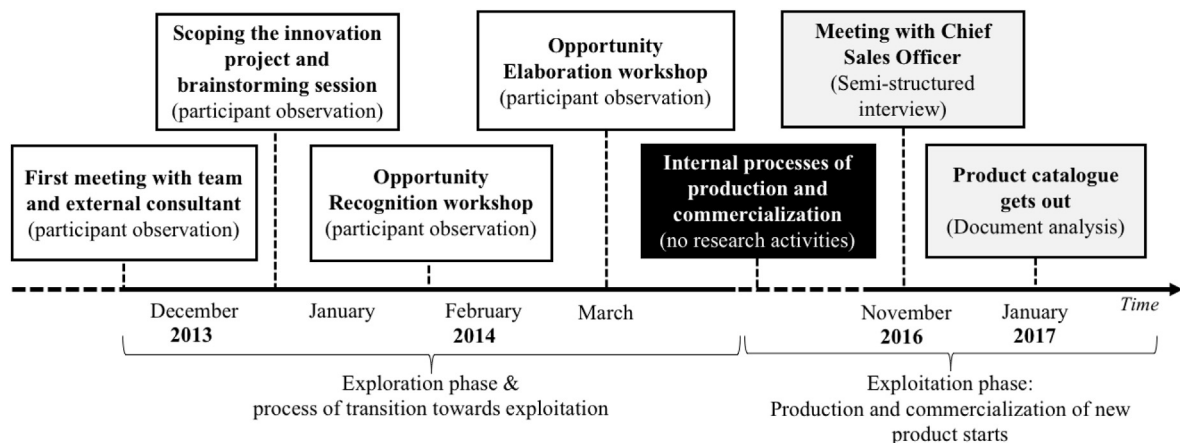


Fig. 2. Visual mapping of my data collection
Source: Author's development.

among the chief sales officer (CSO), the R&D director (R&D) and the production worker (PdW). The conversation presented in the vignette below illustrates two aspects. First, it illustrates the team members' reflections on initiating an innovation project as a source of their innovation capacity building. Second, the conversation emphasizes how the organizational context and prior innovation project experiences had influenced the team members' way of thinking:

R&D: "I think that it is hard for all of us on the team to break out of our daily routines!" *[interpreting]*

CSO: "I agree – my experience is that if we introduce change to a product or even a new product. My work with sales has become more difficult because I do not have as good of a sales pitch or arguments as I would have had with our current product portfolio!" *[interpreting]*

PdW: "Well, I sometimes find it hard to think about so-called end-products because most often what we produce and sell becomes part of a larger product and sometimes even an invisible part of that product – this aspect makes it difficult for me to think innovatively!" *[interpreting]*

R&D: "There is a reason why we contracted with you [the external consultant] – I might have the title of R&D Director, but I manage our production sites, and we do not have any formalized innovation center or positions within innovation or new product development. So, when a new opportunity arises, we all help each other and do the best we can!" *[Institutionalizing]*

CSO: "Yes, in our organization the process of creating new products is never the same. We operate in so many different markets, so I find it hard to buy into one particular process in which all our ideas have to go through. Is it a product for our acoustics market, is it a product for the construction industry, or is it a product for furniture production? There is such a big difference!" *[interpreting]*

R&D: "Well, I do think that we have many ideas, but somehow the good ideas are seldom realized!" *[interpreting]*

PdW: "I agree, we are good at spotting new ideas, and we are especially good at identifying ideas that would be easy for us to turn into products, but more often than not it turns out that we get stuck in the process of turning the idea into a product!" *[Institutionalizing]*

During the meeting, in which these perspectives were articulated by the team members, the external consultant (EC) told the team that these perspectives were natural human mechanisms that were triggered and that innovation processes had to be operated on a systematic basis so the team could build their capacity to run innovation projects in the future. The external consultant utilized following metaphor to create a common understanding among the team members with regard to the importance of a systematic approach to innovation projects:

EC: "Try to think about a game of handball. There are rules in place, you know who is on the bench and who is playing at specific times, and you know that you have different roles to play and that you have the opportunity to play the game differently depending on the team you are playing against. Additionally, you know when to move backwards and forwards in the process!" *[integrating]*

The external consultant's usage of this metaphor seemingly made the team members lose their guard towards the process that the external consultant had presented as foundation to the innovation project – especially the chief sales officer who explicitly had

articulated a reluctant attitude towards utilizing one specific method only.

4.2. Micro processes on the individual and the group/team level

The results of the micro-processes on the individual and the group/team levels are divided into the following sub-categories:

4.2.1. Difficulties staying in 'exploration mode', 4.2.2. Easier to recognize and elaborate opportunities closer to core business, and 4.2.3 Processing towards 'exploitation' is difficult.

4.2.1. Difficulties staying in 'exploration mode'

During the opportunity recognition workshop, the external consultant had to break out of his role as project manager and initiate a reflection-in-action process to provide feedback to the team members when he found that there was a need for capacity building. In particular, the team members' tendency to 'jump to conclusions' and their consequent lack of ability to stay in the exploration mode was problematic in the early stages of the innovation process, which is illustrated by the following vignettes:

EC: "I think that you are trying to develop a lot of things into one product. I see your dialogue as taking two different directions that relate to two different products with two different purposes and goals!" *[interpreting]*

R&D: "What do you mean?" – We are all talking about the same idea, right?" *[interpreting]*

EC: "I see it as two different opportunities: 1) a product that can function as an air-plug (...), and 2) a product that is inflammable. These at two distinctive features, and therefore we need to break this idea into two different opportunities I reckon!" *[interpreting]*

CSO: "You are indeed right! – I did not see it this way!" *[integrating]*

R&D: "Yes! – that might actually work! – but is that not difficult and expensive?" *[Integrating]*

EC: "I guess! – but remember, now is not the time to evaluate or judge the ideas or opportunities; we are in a process of exploring and recognizing their value, so please no judgments!" *[interpreting]*

R&D: "That is true (...) It is just quite fuzzy for me not to know what the product might be, when we are only talking about the 'job of the product' without an actual product!" *[interpreting]*

EC: "This is a classic example in innovation management (...) we will experience a lot of uncertainty in this process (...)!" *[integrating]*

R&D: "It is okay! – I just had to say that I find it difficult not to go directly into solution mode!" *[intuiting]*

As the opportunity recognition process continued under the guidance of the external consultant, it became notable that the members within the team began to articulate the importance of their not 'jumping to conclusions too quickly'. This change of attitude is illustrated with the following vignette stemming from the opportunity recognition process of idea 7:

R&D: "Well, we already talked about utilizing ceramics in the thermos mats [idea 3], so I think that this idea has been covered!" *[interpreting]*

PdW: "I still think that it is interesting to delve into, if we look at the 'job of the product' and the purpose of adding materials that accumulate heat!" – "We could do experiments with technical ceramics and utilize a PUR method to see how the ceramics act and react to the froth!" *[integrating]*

4.2.2. Easier to recognize and elaborate opportunities closer to core business

It also became notable that the team found it easier to recognize opportunities when the ideas were closer to the organization's core business compared to opportunities that were more adjacent thereto. Note differences in the dialogues in the following two vignettes:

R&D: "I do not know anything about biology, so I find this idea very hard to relate to!" [*intuiting*]

CSO: "However, if we consider air filters for operating rooms at hospitals and quarantined areas in hospitals, then it might be an interesting idea!" [*integrating*]

R&D: "Well, in that case, I find the idea to be too far away from our core business, so I think that we should let it go!" – We would rather focus on opportunities closer to our core business!" [*interpreting*]

PdW: "However, if we look at the general transportation of goods, the traditional way is to utilize Styrofoam granulates that get all around!" [*interpreting*] – "How about we create a soft core foam as a sandwich construction so it is hard, e.g., close to the edges of cardboard boxes and soft on the insides, so it automatically fits the element!" [*integrating*]

CSO: "That would be an interesting opportunity – and an easy solution!" [*integrating*]

R&D: "If we go for products for the private market, it could be great to create a high-end box, e.g., for porcelain and other fragile goods!" [*interpreting*]

PdW: "We could also sell and distribute it as a vacuumed-packed product, so it does not fill up space in warehouses!" [*interpreting*]

CSO: "Great thinking – this would also make logistics cheaper!" [*integrating*]

The first vignette illustrates an example of an opportunity that was perceived to be too far away from the organization's core business by the R&D director. The second vignette provides an example of an opportunity that is closer to the core of the organization's routines and technology. In line with this, it seemed easier for the team members to contribute perspectives and solutions during the process of opportunity elaboration compared to the process of opportunity recognition. Their critical sense concerning fast decisions and assumptions became explicit in their dialogue. See the example below:

R&D: "We have worked with different types of glue, but we do not know if it will work and keep the product mounted to the element for half a year, three years or even more, and we do not know how the glue will react to different temperatures!" [*interpreting*]

PdW: "I actually do not think that we have a problem with the glue we use!"

CSO: "Well, we actually do not know this!" [*interpreting*]

PdW: "What do you mean?"

R&D: "For example, we have not tried to freeze the glued element and test it, so we do not know how it will react to changes in temperature!" [*integrating*]

PdW: "Luckily, we have a good contact with a glue expert, so we can always get advice!" [*integrating*]

EC: "This is great, as long as you are working proactively with creating and testing your prototypes and as long as you base your opportunity elaboration on expert advice and not your own assumptions, then I am very happy!" [*Institutionalizing*]

4.2.3. Processing towards exploitation is difficult

During the elaboration process, the team members stated that they found it difficult to create ideas for how to test the prototypes of the products they had created, in reference to their previously mentioned history of not realizing the many good ideas they would normally come up with. The external consultant stated that it is often simpler than expected to create a test for a proof of concept for an idea. The following examples are taken from dialogues pertaining to the elaboration of idea 3, 'Winter mats that keep materials frost-free', and idea 12 'Wave-shaped condensation-free batches':

EC: "I noticed that your neighbor down the road is a mason – why do not you go visit him and ask if he can create a few prototype mock-ups for you with bricks and mortar so you can test the insulation mats this weekend? – The weather forecast this morning said that there would be around minus 20 °C, so this is a perfect condition for testing your idea!" [*institutionalizing*]

EC: "I think that it would be a great idea if you [PdW] took a few different elements back to your home and that you tested how the elements react to the large changes in temperature there are [between day and night time] in your greenhouse!" [*institutionalizing*]

Later in the opportunity elaboration process, the external consultant's reflection in action concerning prototype testing could have influenced the mode of thinking in the team since one of the team members stated the following when elaborating the opportunity related to idea 19:

CSO: "We could actually just take this prototype with us and visit one of the sites where they are building new houses. There, we could ask some of the builders to try to utilize the prototype and see if they find it smarter and easier to utilize compared to what they use today!" "This would give us immediate feedback!" [*institutionalizing*]

4.3. Output of the innovation capacity building process

Although the team members from the beginning of the innovation project expected that it would be difficult for them to take on the role as innovators responsible for exploring new, sustainable product opportunities, they did complete the innovation process. The combination of completing an innovation project as a source of innovation capacity building together with the external consultant led to following output (See Table 2):

The brainstorming session led to the identification of 20 ideas. Some of these ideas represented concrete product ideas, e.g., idea 9 'doors with thermal and sound insulation' and idea 17 'flexible walls (...)'. Other ideas focused on the 'job of the product' being the problem the idea would solve without specifying a product as a solution, e.g., idea 6 'carbonize outer surface on polymer' and idea 14 'avoid household drains clogging'. In the process of opportunity recognition, some ideas were not found to be viable by the team members; thus, they decided not to continue working on them, e.g., idea 10 'vacuum insulation'. However, the elaboration of some opportunities that seemed to be 'easy' to produce were discontinued in the process, e.g., the 'sausage-like PPI foam to household draining systems' (idea 14: 'a'). When I asked the chief sales officer about this decision, his line of argument was as follows: "We found a cheap product very similar to this in our local DIY store a few days after the workshop, so it would not make sense for us to continue elaborating on this opportunity!". Other ideas were used as a foundation to create different types of opportunities, e.g., idea 1

Table 2
Overview of ideas, opportunities and commercialized products.

Ideas (20)	Opportunities (28)	Products (13)
Idea 1 Oxygen-blocking surface	a) Oxygen-blocking surface b) Fire-resistant surface c) Antipuncture car tire d) Antipuncture bicycle tire e) PPI foam bicycle seat	(None)
Idea 2 Use foam underneath concrete floors as insulation	(None)	(None)
Idea 3 Winter mats that keep materials frost-free (e.g., on construction sites)	a) Adding 10–15% ceramics and heat it so it keeps warm for hours b) Sew batches with aluminum thread and mount a 12-V battery c) Utilize isocyanate to froth polyurethane to avoid thermal bridge	(None)
Idea 4 Mats for the agro-industry	a) Utilize aluminum thread to keep temperature warm in winter b) Integrate technical gas as growth retardant or accelerator	(None)
Idea 5 Acoustic screens along rural roads	a) Mobile acoustic screens for large, outdoor concerts to avoid reflecting sound	Commercialized as noise reducing sound baffles to reduce industry acoustics in production sites
Idea 6 Carbonize outer surface on polymer	a) Fire-resistant insulation	(None)
Idea 7 Increase weight by adding stone or rubble	a) Sound insulation that reduce/remove resonance noise	(None)
Idea 8 Insulation for felt roofing to eliminate dew point	(None)	(None)
Idea 9 Doors with sound and thermal insulation	a) A sound-insulated door b) A thermal-insulated door	(None)
Idea 10 Vacuum insulation	(None)	(None)
Idea 11 Protection for transportation and freight carriers	a) Customized foam to transport fragile content such as porcelain b) Sell the foam as a vacuum-packaged product to reduce amount of space used in warehouses	Commercialized as 1) customized packaging foam, 2) transport solutions, and 3) PE foam tool boxes
Idea 12 Wave-shaped condensation-free batches for steel plates	a) A product that reduces condensation (heat/cold) issues b) A product that increases condensation to generate water	(None)
Idea 13 Dew point and polymer batches	(None)	(None)
Idea 14 Avoid that household drains clogs	a) Sausage-like PPI foam to avoid leaves going into draining system b) Applying layers of different types of PPI (sandwich construction) to create a straining mechanism	(None)
Idea 15 Poly-grow product	a) A horticulture product to grow vegetables in, so rinsing of dirt and sand is taken out of production chain	(None)
Idea 16 Use polymer to make seed sprout	a) Make seed sprout faster via photosynthesis	(None)
Idea 17 Flexible walls that function as room separator	a) Flexible room separators with noise reduction b) Fire resistant room separators	Commercialized as 1) acoustic ceilings, 2) acoustic walls, 3) acoustic floors, 4) In-house acoustic panels, 5) In-house screen walls with options for art-work
Idea 18 Noise-reduction for kitchen hardware	a) Use foam to reduce noise from e.g., refrigerators and dishwashers	Commercialized as standardized foam sheets with adhesive tape that can be mounted in e.g., kitchen structures
Idea 19 Filters for ventilation systems that enable high airflow	a) Air filters for buildings	Commercialized as filter applications in different materials and densities for 1) air, 2) dust, and 3) water
Idea 20 Biological filters	a) Biological filters containing of magnesium or copper	(None)

Source: Author's development

'oxygen-blocking surface' led to the recognition of five opportunities such as an 'antipuncture car tire' and a 'PPI foam bicycle seat'. Finally, some ideas were elaborated upon by discussing potential solutions, e.g., idea 3 'winter mats that keep materials frost-free' where 3 different solutions were proposed. A total of 13 products were commercialized because of the innovation project, and these 13 products could be traced back to ideas 5, 11, 17–19.

During the post-project interview with the chief sales officer, he stated the following: *"The [innovation] process had provided the team with a new way of thinking about and acting on new opportunities, and throughout the organization, they had adopted the vocabulary utilized by the external consultant to speak about the*

creation of new products in the organization" [institutionalizing]. The perspective presented by the chief sales officer gave me the impression that the innovation project has had a positive effect on the organization but that the process was also difficult and frustrating at times because many existing assumptions had been challenged and new routines developed.

5. Discussion

The discussion is structured as follows. First, to answer to the study's first research question I discuss my findings in relation to the barriers experienced by the team members when they were

asked during the innovation project to switch from their daily work mode of 'exploitation' to the work mode of 'exploration'. Hereafter, I discuss my findings concerning the team members' ability to remain and navigate in the 'exploration mode'. Then, I focus on my findings related to the team's transition from exploration towards exploitation, and, finally, I discuss whether and how the case organization did build the innovation capacity of its members. To recall the definitions of exploration and exploitation, please revisit section 2.1 *'Exploration and Exploitation in organizational learning'*. Inspired by Gallo et al. (2018), I built new propositions as part of my discussion. The ambition with these propositions is to make them both theory-related and real world embedded in such way that they provide answer to the study's second research question: *How can the findings be used to advance the current understanding of the nexus between sustainability-oriented strategy implementation and organizational learning?*

5.1. Transitions from exploitation to exploration and back again

First, the case study supports the premise that it is difficult for organizational members to navigate in both domains of exploration of exploitation when implementing sustainability-oriented strategies via innovation projects (Klewitz and Hansen, 2014; Vieira and Amaral, 2016; Nicolletti et al., 2019). This premise goes back to the argument that the activities related to the daily work of organizational members are often characterized as being either explorative or exploitative (March, 1991; Gaim and Wählin, 2016). Second, and important to note, the case study establishes that organizational members can build their capacity to navigate in both domains and that this learning process is perceived as being difficult by these members (Klewitz and Hansen, 2014; Gibson and Birkinshaw, 2004; Andriopoulos and Lewis, 2009; Havermans et al., 2015). The argument related to the first claim can be found in the vignettes related to the conversation between the team members at the first meeting with the external consultant – see section 4.1 *Micro-processes on the organizational level*. Some of the arguments given by the team members at this meeting were that the organization did not have a formalized innovation center or any experienced innovation professionals employed in the organization. In addition, the team members told me that new work processes were created for new product opportunities depending on the industry at which they would be aimed. This perspective corresponds with the findings of Klewitz and Hansen (2014), and it illustrates an empirical example of how roles and processes change because of the implementation of a sustainability-oriented strategy (Nicolletti et al., 2019). From the multilevel perspective of organizational learning theory, the argument here would be that the case organization does not have any institutionalized processes or routines to realize innovation projects but, rather, more *ad hoc* approaches where the organizational members “*help each other and do the best we [they] can!*” (van Hoof, 2014). Please remember that this lack of institutionalized practices was also the key driver for initiating the collaboration with the external consultant to build the organization's innovation capacity (Klewitz and Hansen, 2014).

5.1.1. Transition from exploitation to exploration

As you might recall, the literature on contextual ambidexterity emphasizes the individual member of the organization and his or her ability to switch between activities related to both exploration and exploitation (Gibson and Birkinshaw, 2004; Raisch et al., 2009; Wang and Rafiq, 2014). While, theoretically, the literature has established that it is difficult to switch between exploration and exploitation activities for organizational members, only a few studies report on field data (see e.g., Wang and Rafiq, 2014; Havermans et al., 2015; Gallo et al., 2018; Nicolletti et al., 2019). The

first transition made by the innovation team members was switching away from their daily routines, which in the specific case organization were characterized as being related to activities of exploitation (March, 1991). Referring to section 4.2.1 *Difficulties staying in 'exploration mode'*, it became noticeable that the team members found it difficult to explore and recognize new opportunities, and especially opportunities that were not closely related to the organization's core business. This perspective is also supported by the data presented in section 4.2.2 *Easier to recognize and elaborate opportunities (...)*. In this regard, it might be worth investigating following proposition:

Proposition 1. *It is easier for organizational members to switch mode from exploitation to exploration if a new product opportunity is closer to a core business compared to more novel product ideas.*

Empirically investigating proposition 1 would be beneficial to the study of organizational learning as well as to the literature of sustainability and cleaner production. One argument is that providing answers from this perspective would enable scholars studying 'how' contextual ambidextrous organizations are built to advance and refine their work (Andriopoulos and Lewis, 2009; Brix, 2019a). Another argument is that if organizational members find it difficult to either understand or find a common agreement about why and how sustainable strategies are important, then close managerial attention must be given to promoting the opportunities related to the change to make it relevant (Brix, 2017; Ortiz-Avram et al., 2018; Nicolletti et al., 2019).

5.1.2. Building the capacity to stay and navigate in the exploration mode

Above, it is claimed that it is possible to build the capacity of organizational members to navigate in the domains of both exploration and exploitation (Gibson and Birkinshaw, 2004; Simsek et al., 2009; Klewitz and Hansen, 2014; Havermans et al., 2015; Brix, 2019b). In practice, I experienced how the external consultant often broke out of his role as innovation manager for the project and initiated a reflection-in-action process to explain to the team members 'why' or 'how' he would recommend that they think or work. Please refer to section 4.2.1 *Difficulties staying in 'exploration mode'* for concrete examples. In this case, the feedback and feedforward (Brix, 2019b) are given by the external consultant acting as an innovation manager and not an 'internal' manager as the literature would expect (see also Wang and Rafiq, 2014). During my participatory observations, I began to notice a change in mindset and behavior among the team members stemming from this reflection-in-action and that the team in general began to adopt the recommendations and ways of thinking that were emphasized by the external consultant. For example, the production worker (PdW) insisted on staying in exploration mode regarding an opportunity that the director of R&D (R&D) wanted to skip. In this regard, an interesting perspective that I did not find in the study's theoretical background emerges: the importance of receiving immediate feedback on actions – both verbal and non-verbal – in the process of learning to explore new opportunities.¹ The literature does emphasize the importance of supportive social processes (Andriopoulos and Lewis, 2009; Nicolletti et al., 2019) as well as the feedforward and feedback between managers and employees as important mechanisms for building innovation capacity (Brix,

¹ Please note that 'immediate feedback' is a highly developed area of research in the educational research. The point here is that immediate feedback emerges as an important theme when an external agent is to help organizational members build their innovation capacity, a theme that is not emphasized by Klewitz and Hansen (2014) or Brix (2019b) as part of their recommendations.

2019b). The emerging perspective enables me to propose a refinement to these feedforward and feedback mechanisms:

Proposition 2. *Organizational members who receive expert feedback on their verbal and non-verbal actions during processes of exploration are more likely to build their capacity to navigate exploration processes compared to organizational members who receive feedback after finalizing (parts of) these actions.*

My argument for proposing a temporal division to the feedforward and feedback mechanism is inspired by Schön's (2017) division between 'reflection-in-action' and 'reflection-on-action'. The first concerns reflection during a process as it unfolds, and the latter concerns reflection on a process after it has ended. Empirically investigating proposition 2 would lead to valuable insights to the literature presented in the theoretical background because emphasis could be given to when feedback and feedforward in a capacity building process are most likely to obtain the best outcome for the organizational members (Raisch et al., 2009; Klewitz and Hansen, 2014; Brix, 2019b).

5.1.3. Transition from exploration to exploitation

While the above discussion treats the perspective of 'switching' from exploitation towards exploration, this section focuses on the 'switch' from exploration towards exploitation. My data establish that the innovation team did succeed in commercializing 13 products based on the innovation process. However, my data also—as expected—demonstrate that this transition process from the exploration mode towards exploitation was not problem-free (Haibin and Atuahene-Gima, 2007). The literature suggests that mechanisms such as 'supportive leadership styles' and 'supportive incentive structures' are important for organizational members when deciding to switch between the two domains (De Clercq et al., 2014; O'Cass et al., 2014; Havermans et al., 2015). In addition, van Hoof (2014) and Vieira and Amaral's (2016) studies also emphasize the importance of these mechanisms as well as additional people-centered elements such as 'redefined work roles' and 'building a collaborative organizational culture' towards a more sustainability-oriented focus among organizational members. Nicolletti et al. (2019) complements the importance of this human-centered perspective on the changes induced by sustainability-oriented strategies where new, collaborative created lessons can become new organizational routines. During my participant observation, I began to notice an interesting phenomenon as the team members received feedback from the external consultant on their transitions. This phenomenon was a division of how the team members' ability to transition towards the exploitation mode began to take shape: A division in the exploration of 'ways of thinking' and 'ways of acting'. As stated above, the team's ability to stay in the exploration mode became clearer as the innovation project moved onwards; however, when the team members discussions about the opportunities that were under elaboration began to stall, they found themselves in a situation of not knowing how to proceed. Please see section 4.2.3 'Processing towards exploitation is difficult' for concrete examples. More specifically, when the team's elaboration of product opportunities got to a stage where it would make sense to create a test of a prototype, they got stuck in the process. Again, the external consultant had to initiate a reflection-in-action process to introduce the team members to different approaches he would recommend for the specific product prototypes that were being elaborated. There, focus was on 'ways of acting' on how to explore and test the functionality of these prototypes. With reference to the same section, this perspective on 'ways of acting' also began to be adopted by the team members later in their discussions during the opportunity elaboration process. This perspective leads me to suggest the following:

Proposition 3. *Making explicit the dialectic between 'ways of thinking' and 'ways of acting' enables organizational members to more easily build their capacity to transition from the exploration mode towards exploitation mode.*

Proposition 4. *The requirement for knowledge concerning 'ways of acting' exploratory becomes more important as product opportunities are turned into prototypes that transition towards the exploitation mode.*

The novelty of introducing the division between 'ways of thinking' and 'ways of acting' implied by the literature that building the capacity to explore new opportunities and to exploit these opportunities requires different skills/competencies at different stages of the innovation process (Raisch et al., 2009; Wang and Rafiq, 2014; van Hoof, 2014). This is not necessarily a new finding; however, the interesting aspect lies in the fine-grained division of 'exploration as thinking' and 'exploration as acting' when organizational members begin building their capacity to realize the potential of sustainability-oriented opportunities (Vieira and Amaral, 2016; Ortiz-Avram et al., 2018; Nicolletti et al., 2019).

5.2. Building innovation capacity

While the above discussion proposes that the individual members of the team and the team in general obtained help building their ability to explore new opportunities and to transition these opportunities into 13 new products, it is difficult to assess whether the organization and its members *post project* lived up to the requirements of the definition of being a contextually ambidextrous organization (Gibson and Birkinshaw, 2004). However, during my post-project interview with the chief sales officer, his reflections on the innovation process and his examples from current practice provided the following two impressions. First, the chief sales officer informed me that a vocabulary of innovation had been adopted by the organizational members in general. According to Nicolletti et al. (2019), such an outcome would enable the organization to mainstream their sustainability-oriented strategy internally, which—in theory—could represent an argument supporting that the organizational members have built new innovation capacity. Second, the different divisions of work activities related to opportunity recognition and opportunity elaboration had been adopted as the organization's approach to product innovation, which represents a new innovation practice (Klewitz and Hansen, 2014) that could also support the argument that the case organization post-project would have built its innovation capacity.

By relying on the multilevel literature in organizational learning, it is argued that the process of building innovation capacity at the case organization had enabled the organizational members to 'integrate' and 'institutionalize' (Crossan et al., 1999; Morland et al., 2019) the 'ways of thinking' and 'ways of acting' exploratory. Therefore, it is possible to add support to the growing amount of literature on contextual ambidexterity that organizational actors within the same unit/organization can learn to both think and act ambidextrously if the context is supportive and if they are given the feedback they need when they need it (e.g., Gibson and Birkinshaw, 2004; Andriopoulos and Lewis, 2009; Wang and Rafiq, 2014; Brix, 2019b).

5.2.1. Building innovation capacity at different paces

My coding of data on the individual, the group/team and the organizational units of analysis suggests that the process of building innovation capacity manifests at different paces. The production worker was the first to adopt the innovation vocabulary, followed by the chief sales officer, and, finally the R&D director. In line with this, the R&D director had more trouble 'staying' in the

exploration mode compared to the two other team members. However, the other two members made the R&D director aware of his ‘jumping to conclusion’ later in the process – interventions that the external consultant had made with all the team members in the early stages of the innovation project. The point is that the transition from having a reactive response – towards the implementation of an innovation-based sustainability-oriented strategy (Klewitz and Hansen, 2014) does not occur over night and that the processes related to such a transition are characterized by different paces of learning occurring on multiple levels (van Hoof, 2014; Nicolletti et al., 2019; Brix, 2019b). While the literature on organizational learning emphasizes the importance of managerial feedback to employees in such a process, and while Klewitz and Hansen (2014) emphasize the relevancy of feedback from external agents, the present case study leads me to suggest the following:

Proposition 5. *The process of building innovation capacity is accelerated if qualified peers provide feedback and feedforward to organizational members compared to if this interaction occurs only between managers and their employees.*

The implication of this finding is that feedback and feedforward from peers is an important mechanism to create a balance between exploration and exploitation, which extends the discussion of how different organizational members can be at different stages concerning their capacity to navigate in and transition between the domains of exploration and exploitation when implementing sustainability-oriented strategies (Klewitz and Hansen, 2014; Brix, 2019b; Nicolletti et al., 2019). By combining the perspectives of proposition 2 concerning the temporal dimension of feedforward and feedback with the proposed phenomenon of peer-to-peer feedforward and feedback of proposition 5, the following matrix can be built:

Fig. 3 introduces a more nuanced perspective on how the interaction concerning feedforward and feedback mechanisms can occur when building innovation capacity in the context of implementing sustainability-oriented strategies (van Hoof, 2014; Klewitz and Hansen, 2014; Brix, 2019b). The nuance becomes especially clear when directing attention towards the peer-to-peer aspect, where it is assumed that there is a lower power asymmetry compared to the high power asymmetry that is most likely present in the manager-to-employee relationship (Gibson and Birkinshaw, 2004; Haibin and Atuahene-Gima, 2007). Another nuance worth restating is that of reflection-in-action compared to reflection-of-action (Schön, 2017). This attention towards a temporal dimension of feedforward and feedback provides a new perspective on both the organizational learning literature and the body of knowledge in this journal as it enables me to suggest a new division between ‘instant capacity building’ and ‘reflective capacity building’.

Combining the dimensions of relationship and time create an opportunity for ‘instant capacity building with high or low power asymmetry’ and ‘reflective capacity building with high or low power asymmetry’. This matrix model hence represents a novel perspective to understand the important mechanisms of feedforward and feedback while implementing a sustainability-oriented strategy (Klewitz and Hansen, 2014), a perspective that goes beyond the manager-employee relationship suggested by Brix (2019b).

6. Conclusion

The study started by asking following research questions: *What barriers and opportunities can be identified when organizational members transition between modes of exploration and exploitation, and how can these findings be used to advance the current understanding of the nexus between sustainability-oriented strategy implementation and organizational learning?* The key contributions of my multi-method approach to answer to these questions are five propositions that extend existing research on how organizational members build their capacity to transition between modes of exploration and modes of exploitation when implementing a new, sustainability-oriented strategy (Gibson and Birkinshaw, 2004; van Hoof, 2014; Klewitz and Hansen, 2014; Ortiz-Avram et al., 2018; Nicolletti et al., 2019; Brix, 2019b). These propositions relate to a more nuanced perspective on exploration with the division between ‘ways of thinking’ and ‘ways of acting’. In addition, another key contribution is Fig. 3 ‘Building innovation capacity across time and relationships’. Fig. 3 offers a more fine-grained elaboration of four behavioral approaches to build innovation capacity compared to the existing body of knowledge in the literatures on sustainability-oriented strategy and organizational learning (Klewitz and Hansen, 2014; Wang and Rafiq, 2014; Brix, 2019b). Although I propose these contributions based on a single case study that is conducted taking a qualitative, multimethod approach, the contributions live up to the expectations of building early stage theories from the fieldwork (Edmondson and McManus, 2007; Colquitt and Zapata-Phelan, 2007; Gallo et al., 2018). The argument is that the study’s contributions enable me to bring out the qualitative nuances of the literature on organizational learning as well as novel perspectives on the implementation of sustainability-oriented strategies in real life practice (van Hoof, 2014).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

		TEMPORAL DIMENSION	
		Reflection-in-action	Reflection-on-action
RELATIONSHIP DIMENSION	Peer-to-peer	Instant capacity building <i>with low power asymmetry</i>	Reflective capacity building <i>with low power asymmetry</i>
	Manager-to-employee	Instant capacity building <i>with high power asymmetry</i>	Reflective capacity building <i>with high power asymmetry</i>

Source: Author’s development

Fig. 3. Building innovation capacity across time and relationships
Source: Author’s development.

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