Early steps in learning about organizational learning in customization settings

A communication perspective

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Abstract

Purpose – This study aims to empirically investigate the role of learning for suppliers of individualized customizations from a communication perspective.

Design/methodology/approach – Five companies providing individualized customizations are investigated through an in-depth qualitative approach. The empirical material is based on data from five presentations in one workshop and seven interviews.

Findings – Four important categories of communication processes between suppliers and customers that stimulate learning were identified: the identification and confirmation of existing knowledge, the identification of knowledge gaps and the creation of new knowledge, the definition of relations and procedures and evaluation and learning.

Practical implications – These findings can help suppliers of individualized customizations become aware of the important role of organizational learning in their day-to-day operations and the value of improving as a learning organization.

Originality/value – This cross-disciplinary study brings together organizational learning and customization research. It is a study that focuses on communication in customization tasks as a base for learning.

Keywords Organizational learning, Communication, Learning organizations, Customization, Collaborative research, Task-based learning

Paper type Research paper

Introduction

To stay competitive, industrial companies have been forced to become increasingly customer-centric rather than merely focusing on costs and quality issues (Wortmann *et al.*, 1997). The idea that "one size fits all" has over time become less accurate, and by embracing the varied needs of the market, suppliers of customizations have obtained a competitive edge in a demanding environment (Pine, 1993). This has driven some companies to position

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themselves as providers of products and services that meet unique customer needs, which demands considerable flexibility and competence.

A supplier's ability to communicate to understand the needs of their customers is of utmost importance in this context (Du *et al.*, 2003; Hicks *et al.*, 2000; Holweg and Pil, 2001), but it's something they tend to struggle with (Ulwick and Leonard, 2002). For example, difficulties can emerge from unclear customer requests, or from suppliers being unaware of important contextual factors of the product or conditions that can cause problems in production processes (Bertrand and Muntslag, 1993). Such issues can be related to Örtenblad's (2018) inclusive approach. Flexibility and the empowerment of employees to fulfill their tasks and customers' wishes is an important aspect that Örtenblad (2013) acknowledges when considering organizational learning in customization settings:

> [T]he employees need to learn things to satisfy new and hitherto unknown customer demands. They also learn from the customers regarding their needs, and in case the employees' previous knowledge is not sufficient, they learn how to meet the customers' demand (Örtenblad, 2013, p. 30).

Communicating to understand customers' needs is thus an important learning process. For this to be transformed to organizational learning, reflection and the development of routines and work procedures for the customization task must be established (Örtenblad, 2018). This is in line with Dixon's (2017) definition of organizational learning as a collective learning process that intends to "continuously transform the organization in a direction that is increasingly satisfying to its stakeholders" (Dixon, 2017, p. 6).

The research fields of customization and learning in organizations became popularized in the 1990s through Lampel and Mintzberg's (1996) "Customizing Customization", Senge's (1990) "The Fifth Discipline" and March's (1991) "Exploration and exploitation in organizational learning". In this study, these research areas are brought together to demonstrate that communication concerning the task of customization can stimulate organizational learning, and that it is important for suppliers of customizations to improve as learning organizations. The study takes inspiration from Senge (1990) who initially focused on how organizations should withstand competition by concentrating on vision, investing in competence and team work, and engaging in systems thinking and consideration of the organization's surroundings. March (1991) emphasized the logics of exploiting existing knowledge as well as exploring new knowledge as an important balance for organizational learning. The way a supplier communicates and deals with customer requirements can also be considered with regard to the four constructs of organizational learning that Huber (1991) highlighted during the same period: knowledge acquisition, information distribution, information interpretation, and organizational memory. Dixon (2017) contributes to this view by arguing that organizational members must collectively make sense of such information for organizational learning to occur.

Many scholars have contributed to the learning organization field, and in reviewing its literature, Santa (2015) found that it related to a variety of domains of interest, such as cultural aspects, leadership, strategy, and technology development, but also change management, power issues, and business outcomes. These interest domains sometimes have varying definitions of the learning organization. However, there is no doubt that research on learning organizations has found outlet in practice in the new knowledge economy (Dixon, 2017). Several researchers (Edmondson, 2012a, 2012b; Engström, 2014; Hackman, 1987; Senge, 1990) have agreed that learning in organizations is largely decided by communication among individuals acting within groups. In a review, Santa (2015) also found that the team level is the most important level for research on learning organizations. Furthermore, Edmondson and Harvey's (2017) research on extreme teaming not only focused on the importance of cross-

functional work within an organization, but also between organizations as in communication with customers.

This study regards the two concepts – learning organizations and organizational learning – as separate but intertwined. In accordance with Örtenblad (2001), *learning organization* refers to a noun – the ideal organization to be achieved. *Organizational learning*, however, is considered an activity or process that occurs in organizations. This view regards organizational learning as a collective process (Örtenblad, 2001). As knowledge is changing constantly, it is learning processes, which continuously transform organizations, that organizations must be skilled at managing (Dixon, 2017).

In this study, focus will be directed towards how suppliers of customizations can strengthen their position as learning organizations by working systematically with their organizational learning processes. The study also takes an interest in how such organizations can find organized procedures, routines and work practices that support organizational learning and improve their communication processes as Dixon (2017) highlights. Thus, Örtenblad's (2013) understanding of organizational learning fits well, i.e. organizational learning as a collective process of which team-level communication is crucial. In accordance with Dixon (2017), this study also argues that suppliers of customizations can benefit from striving to develop as a learning organization – not with specific knowledge content in mind but rather as an important resource for learning structures and procedures. It also responds to Tuggle (2016) who argues that there is a lack of understanding about where in organizations that learning processes are centered.

The need for organizational learning research in proximity to practice has been acknowledged by several scholars (Berends *et al.*, 2003; Örtenblad, 2018), and one way of approaching this is by considering how dealing with tasks triggers organizational learning (Ellström, 2010a; Engström, 2016; Hackman and Oldham, 1980; Nonaka, 2002). Understanding a customer's needs can be viewed as a collective learning process during which individuals with different functions in and between organizations communicate and learn from each other. While suppliers need to learn to understand their customers' needs, the procedures of doing so can also be improved by organizational learning (Ellström, 2001), being the actual learning activities or processes that transpire in organizations (Örtenblad, 2001). Thus, these suppliers can benefit from improving their ability to understand their customers and thereby strengthening their capabilities as learning organizations.

Purpose

This study is a first step in developing an understanding of the role of learning in individualized customization settings. The purpose is to empirically investigate how suppliers of individualized customizations can facilitate organizational learning by improving their communication processes and strengthen their capabilities as learning organizations through the task of understanding customers' needs. The purpose is addressed through a research question:

RQ1. What are suppliers' experiences of their communication with customers and their internal work processes in individualized customization settings?

Customization as a base for learning

Performing tasks creates opportunities for individuals and groups to learn. At the same time, some degree of knowledge is required for individuals and groups to be in a position to handle different tasks in the first place (Ellström, 2001). Some tasks, often those of a more

complex nature, require communication between several individuals and groups with different skills to reach a solution (Ellström, 1992, 2001, 2006). To provide customizations can in some cases be considered as such a task.

Customization processes

Companies have adopted a variety of production approaches to customization, and these production approaches employ different degrees of customized activities (Lampel and Mintzberg, 1996). They all comprise some production-related activities that are influenced by customer requirements, as this is a prerequisite for customization (Hoekstra and Romme, 1992; Wikner and Rudberg, 2005). Such activities are referred to as customer-order driven or commitment driven, as they cannot be performed until after committing to a customer. These activities stand in contrast to speculation-driven activities that are based on speculation of future customers' needs. Speculation-driven activities can be performed in advance of committing to a customer and are therefore not customized.

For products whose development, design or engineering activities are commitment driven, customers can get their product fully tailored to their preferences. Here, a customer's individualized needs are responded to, which is why this type of customization is hereafter referred to as an individualized customization. An individualized customization can be defined as a customized solution that are defined after commitment to the customer, of which there are no predefined solutions to choose from (Käkelä and Wikner, 2018). It differs from modularization and mass customization (Fogliatto *et al.*, 2012) where suppliers design or engineer possible solutions in advance of committing to a customer by speculating about prospective customer's idiosyncratic needs (Salvador *et al.*, 2009).

When considering complexity and intensity of communication required, the task of providing individualized customization is arguably more demanding than that of mass customization. For individualized customizations, suppliers must comply with differing customer needs for each customer commitment (Holweg and Pil, 2001) and additionally, these needs must be spread out in the internal supply chain (Lee and Whang, 2000). Uncertainty concerning the task and the needs of the customer is usually inherent, while the ability to plan or make decisions about activities in advance is limited (Bertrand and Muntslag, 1993), meaning that new knowledge and competencies must be continuously developed for new customer requirements to be met.

Communication processes

Organizational learning is a collective process based on communication between individuals at the group level of the organization (Dixon, 2017; Edmondson, 2012a). Engström (2014) identified specific communication patterns in work groups that were related to particular dimensions of a task. To execute a predefined task, communication patterns included minor variation, consolidated information, and a focus on solutions. Communicative actions such as instructing, ordering, finding solutions and agreeing were used frequently to exploit knowledge. To develop a task, communication patterns included major variation, expanded information, and a focus on problems. Communicative actions such as generating ideas, building on other people's ideas, and asking exploratory and critical questions were common ways of creating new knowledge. Sharing experiences and information as well as listening and receiving information in general had a positive impact on all situations. Conversely, hiding information and not answering questions hindered. Individuals and groups often prevent the development of organizations by resisting learning and engaging in defensive routines to avoid critical reflection (Argyris, 2010). These defense patterns take the form of blocking conversations, blaming others, or foreclosing on other individuals or

their reasoning (Argyris, 2010). Illeris (2007) also discusses obstacles to development, and mentions "learning wrong" as a dimension, along with defense against learning and resistance to learning. The way a task is handled also generates important opportunities for responses and feedback for learning (Engström, 2014, 2016). Feedback can engender both support and challenges, not as a judgment of performance but as guidance in the learning process (Egan, 2002). *Confirmatory feedback* aims to support and strengthen a person in something that he or she already knows or does. *Corrective feedback* engages a person in dialogue, exploring new ways of thinking or doing things (Egan, 2002).

In another view of communication, according to problem solving and levels of abstraction in an organization, Watzlawick *et al.* (2011) suggest we look into the problem itself, as this is where the solution is embedded. Problems that occur in communication between humans can be solved when people talk about what is going on in the communication process. Such use of communication skills to communicate about communication is *metacommunication*. Metacommunication and communication processes related to a task in a situation are characterized by different levels of abstraction (Watzlawick *et al.*, 2011). Metacommunication is more abstract, while communication is more concrete.

Levels of learning

Task content, methods and goals trigger learning in an organization, and depending on the situation, different levels of learning (Figure 1) can be activated (Ellström, 2001).

If the task (content), its methods (work procedures) and its goals (results) are predefined, the lowest level, *reproductive learning* (Ellström, 2001), is needed. The learner knows exactly what to do, has probably done it many times before and knows what the results will be. Quite routinized or automated actions can be performed without much conscious attention. The knowledge required already exists in the organization, and its use can be compared with March's (1991) concept of exploitation. If the task and methods are predefined but the goal of the task is not, *productive learning type 1* (Ellström, 2001) occurs. The learner needs to evaluate the outcomes and possibly make minor adjustments to the methods used, which can be viewed as a process of improvement. If only the task is predefined and the methods and goals are not, *productive learning type 2* is needed, whereby the learner engages in knowledge-based problem solving through experimentation. If neither the task nor its methods and goals are predefined, the learner will probably need to diagnose a perhaps unclear and puzzling situation. Here, the task, conditions and goals must all be defined by the learner, suggesting that *creative learning* is needed. The learner needs to question established definitions of problems or solutions and retrospectively reflect on and evaluate

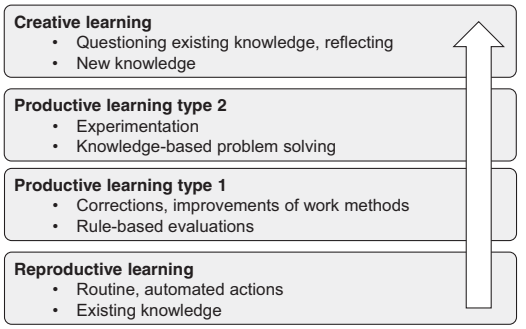

Figure 1.
Ellström's (2001) levels of learning

existing knowledge to create new knowledge; this process could be compared with March's (1991) concept of exploration. In other words, the degree of uncertainty, for example in terms of individualized customization tasks, dictates the level of learning required.

Learning organizations

Örtenblad (2013) suggested four important aspects of learning that together can provide a complete learning organization: learning at work, organizational learning, climate for learning and learning structures. If all are not represented, at least one should be in place for an organization to be called a learning organization.

Learning at work implies learning in an informal way while working. As a way of learning to improve skills and routines without joining special courses (Örtenblad, 2013), learning at work can be defined as learning while acting. When our habits are disturbed (Dewey, 2002) the potential to learn is highly stimulated. The literature on workplace learning (Ellström, 2011; Malloch *et al.*, 2011) has focused on situations in which we visualize problems, disorders or difficulties and take the opportunity to find new ideas, test new ways of working, and build new routines (Ellström, 2010b). That research field is close to the concept of *organizational learning*, Örtenblad's (2013) second aspect. The knowledge learned by single individuals or teams needs to be stored and made available for others in the organization. Organizational learning implies exploitation of the already known to execute tasks in the most efficient way at the same time as the organization explores new areas of knowing and creates new knowledge to improve and renew the organization or the task performance. This balance between exploitation and exploration build on March's (1991) understanding of organizational learning and is investigated in the growing research area of ambidexterity (O'Reilly and Tushman, 2004), which in recent research has also been considered in connection to customization (Engström and Wikner, 2017). Örtenblad's (2013) third aspect, *climate for learning*, implies that workers should be encouraged to make mistakes as a way of stimulating learning. Edmondson (2011) finds learning from failure to be an important starting point for teams to speak up and question old ways of doing things, and to feel safe enough to test new ways and experiment in work processes. The fourth aspect, *learning structures*, focuses on flexibility and empowerment of employees to fulfill their tasks and customers' wishes to the very best of their ability. The way of looking at structures here is about how to organize the work through high degree of participation, and to give people in the organization responsibility and inclusion in decision making. Dixon's (2017) way of dealing with learning structures is more about organized processes and creating flexible routines and processes so that the organization can transform itself continuously.

Research methodology

This study seeks an in-depth understanding of a phenomenon, and its practice of interest – that is, suppliers' experiences of communication with customers – is contingent upon context. This argues for a research approach that allows the phenomena to be studied in a community of practice (Adler *et al.*, 2004). The present study has been performed within the frame of a collaborative research project called "The Whispering Game" (TWG), focusing on communication in customization settings. Collaborative research is defined by Adler *et al.* (2004, p. 83) as "an emergent and systematic inquiry process, embedded in a true partnership between researchers and members of a living system for the purpose of generating actionable scientific knowledge". The interaction between the scientific and the practical systems works as a boundary spanner in the knowledge-creation processes (Aagard Nielsen and Svensson, 2006).

Samples

Five different companies participated in TWG, all industrial business-to-business suppliers of individualized customizations, and all having expressed a need for a better understanding of their communication processes in relation to customizations. Because of this, they had requested to take part in the research project. Besides providing individualized customizations, the companies differed from each other in various respects (Table I).

Each company had a representative who served as the stakeholder of the company's engagement in TWG. The representatives' roles in their respective companies varied but were similar in that they had responsibility for the challenges that formed the basis of their participation in the research project.

Data collection procedure

The empirical material is based on qualitative data from five presentations made in one workshop and seven in-depth interviews (Table II). A second workshop was conducted to allow for validation support. The workshops acted as a way for scholars and company representatives to share experiences and develop understanding about a specific problem or common interest. The workshops and interviews were conducted during the fall of 2017 at the premises of the participating companies. All presentations at workshops and interviews were recorded and transcribed verbatim.

In the first workshop, data were collected from company representatives' presentations of customer-order incidents, based on Flanagan's (1954) critical incident technique (CIT). CIT has its roots in industrial and organizational psychology and was developed to get an understanding of human actions in dealing with tasks (Flanagan, 1954). The technique has since been used extensively in research fields such as communication, business administration and organizational learning (Butterfield *et al.*, 2005). It has also been used as a tool for understanding customer relationships and the technique is based on the respondents' ability to remember perceived incidents and make judgements based on that (Edvardsson and Roos, 2001). It allows for critical reflection, both from positive and negative incidents, which can lead to organizational learning (Davis, 2006; Gray, 2007).

In this study, CIT has enabled concrete descriptions of incidents embedded in customization practices to be analyzed. The company representatives were instructed to select a case they regarded as complicated in terms of communication with customers and within the company. The representatives were given questions to base their presentation on:

- What caused the different communication problems that occurred in the case?
- What were the characteristics of the communication in the case in regard to the whole customer order fulfillment process?
- What was the effect of the communication in the case?

One or two representatives from each participating company presented in detail the customer-order case they had selected as a critical incident. The audience (in total five researchers and eight representatives from the other participating companies) asked clarifying questions and made comments. These five presentations gave a necessary understanding of the companies' circumstances while also providing a conceptual apparatus that could be employed in the interviews.

The in-depth and qualitative interviews were held by two researchers with one or two persons in key functions in the customer interfaces of the companies. The seven in-depth qualitative interviews were based on the same questions as for the presentations, but there was also time to elicit richer descriptions of the processes in other cases. Particular focus

Table I.
Participating companies

Company Alpha	Company Beta	Company Gamma	Company Delta	Company Epsilon
100 employees Engineering consultancy firm Services include commitment projects and taking responsibility for the development of its customers' products. It is common for customer requirements to change during the development process, which calls for responsiveness toward the customer	25 employees Manufacturer of doors and gates Customers varying from construction firms and housing cooperatives to individual private customers. These customer segments require different approaches as they generally involve different numbers of actors and have varying specificities in their requirements	100,000 employees Equipment supplier Complex production with many variants. Its production and the flow of information in its internal supply chain are both characterized by complexity. Being a large and geographically scattered company, customers can also be internal – this sometimes makes the supplier handle the relation with relative ease	400 employees Contract manufacturer Developing and supplying customized solutions in small- and medium-sized series to industrial customers. It is a global company, but the three plants considered in this study are all located in Sweden. These plants develop and manufacture products for a variety of markets and customers	150 employees Manufacturer of industrial machinery Provides industrial machines to customers located around the world. Their products are similar in terms of basic purpose and function but differ in areas of application. Sometimes, this requires an understanding of regulations that not even the customer is aware of

Form	Date	Company	Respondent/Participant
Workshop 1	08/29-30/2017	All (5)	All company representatives
Presentation 1		Company Alpha	Presenter: Project manager
Presentation 2		Company Delta	Presenter: Business manager
Presentation 3		Company Beta	Presenter: CEO and Salesperson
Presentation 4		Company Epsilon	Presenter: Customer support manager
Presentation 5		Company Gamma	Presenter: Global materials manager
Interview 1	9/20/2017	Company Alpha	Project manager/Site manager
Interview 2	9/26/2017	Company Delta	Business manager
Interview 3	10/13/2017	Company Delta	Business manager/Quality manager
Interview 4	10/23/2017	Company Beta	Salesperson
Interview 5	10/24/2017	Company Epsilon	Customer support manager
Interview 6	10/24/2017	Company Epsilon	Customer service
Interview 7	11/06/2017	Company Gamma	Global materials manager
Workshop 2	11/07-08/2017	All (5)	All company representatives

Table II.
Data collection occasions and participants

was placed on the companies' experiences of communication with customers in the initial stages of contact, primarily before signing a contract. The reason for this was that this phase had in the first workshop been identified as the most intense in terms of communication to understand customers' needs. The respondents were selected in conjunction with the company representatives, who were able to suggest informants who were knowledgeable about the communication processes for the task in focus. All respondents were actively operating in roles in proximity to the customer interface and had practical experience of the studied phenomenon.

After the data from the presentations and interviews had been analyzed, the researchers presented preliminary results at the second workshop to obtain support with validation from the company representatives. This enabled them to validate whether the researcher's interpretations of the communication processes in the companies were accurate. It also gave an opportunity for the researchers to clarify events or terms that were unclear. This procedure is illustrated in Figure 2.

Data analysis

The three-step data analysis was inspired by Gioia *et al.* (2013) and is visualized in Figure 3. The first step was empirically grounded, with keywords noted in the transcriptions of the

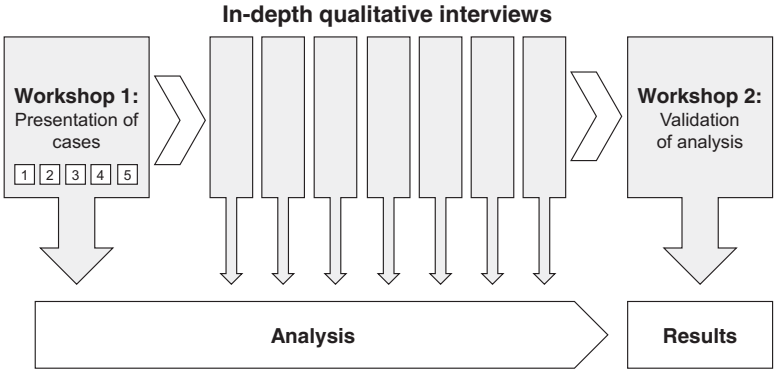

Figure 2.
An overview of data collection and analysis

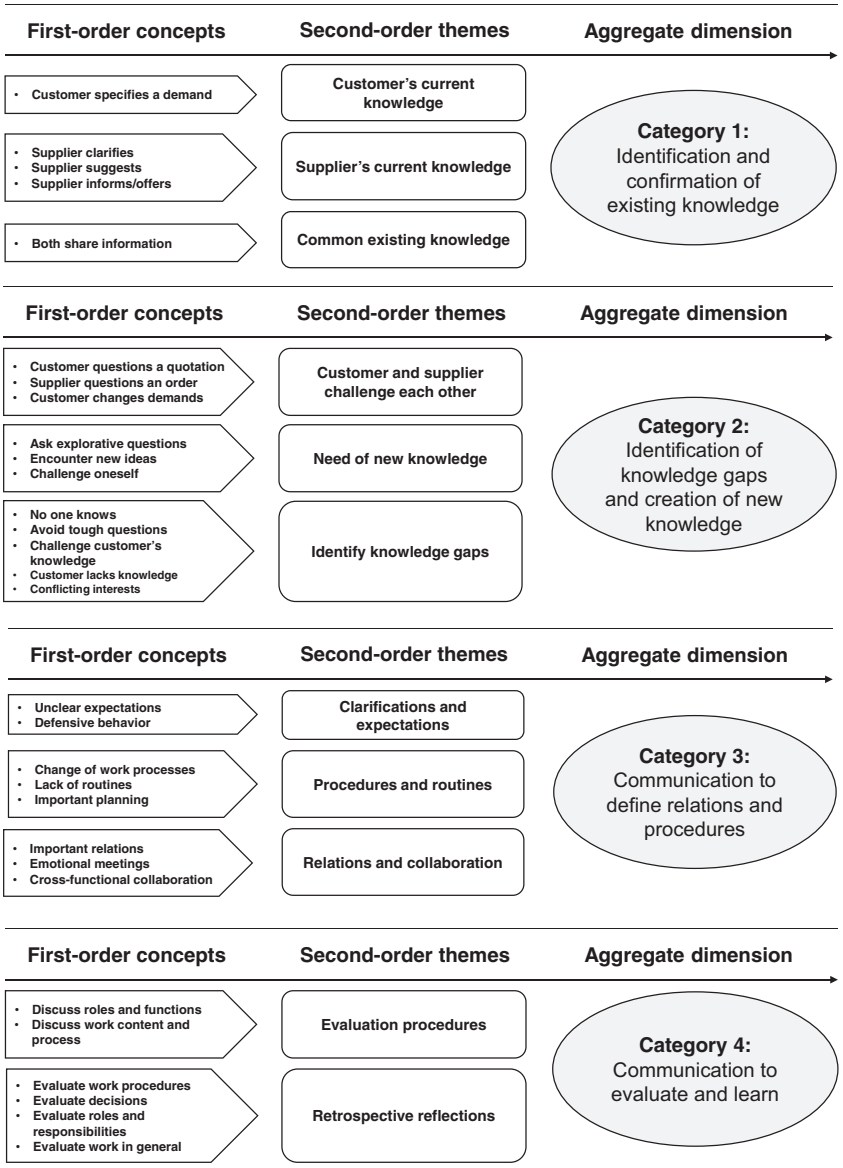

Figure 3.
Data structure with examples of the data analysis process, through three steps inspired by Gioia *et al.*'s (2013) model

interviews and first workshop. The first-order concepts derived from this process were therefore a reflection of the researchers' understanding of the empirical data. The second-order themes were clustered from the keywords and analyzed from our theoretical framework. Gioia *et al.* (2013) describe this step as entering the "theoretical realm, asking whether the emerging themes suggest concepts that might help us describe and explain the phenomena we are observing". The last step of the analysis generated the aggregated dimensions or categories that comprise the results.

Communication in customization settings

With the data clustered and assigned, four categories of communication connected to the suppliers' tasks of understanding customers' needs were found.

Category 1: identification and confirmation of existing knowledge

In some situations, the dialogue between the customer and supplier seemed to run quite smoothly. Typically, when the relationship had lasted a very long time or a similar type of customer order had been handled previously, the communication was described as follows: When customers place an order, send a request, specify a demand, or approve an offer, they acknowledge their own competence regarding the product or service in question, and express their wishes and will on the basis of a relatively detailed preconceived idea. This can be viewed as a way of showing existing knowledge. When a supplier answers requests or, through feedback, confirms customer orders with an offer, clarifications, solutions or declination, they show their knowledge and competence.

> It is not always certain that the salesperson has understood what the customer has requested, which is why we want to carry the purchase order and quotation with us. The salesperson can be pressured by the customer, and if our order receiver says that something takes seven weeks to do, but our salesperson sells it by assuring it takes four weeks [. . .] Then our organization will be put under a lot of pressure (Customer Support Manager, Company Epsilon).

> We provide drawings that the customer has to approve (CEO, Company Beta).

Through these processes, both parties confirm their understanding of the other's knowledge. Existing knowledge is thus identified and understood as common shared knowledge between the two actors: customers and suppliers.

Category 2: identification of knowledge gaps and creation of new knowledge

Sometimes, dialogues between the customer and supplier were perceived as a bit more complicated. This typically occurred when the relationship was new or when the type of customer order was unlike anything the supplier had handled before. In some cases, suppliers acted as a customer's "development support". The communication was described as follows: When customers question or oppose an offer, make changes to an order or demand, or ask explorative questions about something that is not clear or is unknown, they challenge the supplier and trigger a need for new knowledge. They can also proclaim uncertainty regarding their own ideas and needs. Conversely, if suppliers ask challenging or more specific questions, encounter new ideas, reveal flawed reasoning or explore their own ideas or customers' ideas, they challenge the customer in a broader sense.

> We must dare to ask questions and be a bit challenging. We are too careful, standing there with cap in hand and pleased that they want to work with us (Business Manager, Company Delta).

> We are not tough enough in negotiations, not asking the necessary follow-up questions because the salesperson might think it's unpleasant. Then, customers do not understand what they request which results in a lot of problems (Customer Support Manager, Company Epsilon).

> This was really a case of the blind leading the blind. None of us knew (Business Manager, Company Delta).

These kinds of processes serve to identify knowledge gaps and seek new knowledge through customer–supplier communication.

Category 3: communication to define relations and procedures

In some situations, the suppliers talked about communication that could help to clear up misunderstandings or prepare for productive dialogue and relations during task execution. They mentioned situations where the people involved got to know each other's competences and roles in the organization. They also talked about a need for procedures and routines in cases where customer dissatisfaction was owing to a lack of timely supplier response. Unclear expectations between customers and suppliers and uncertainty regarding who should be in contact with whom were also mentioned.

> During this project, we had a chaotic situation. At the time, a lot of things were cleared up and I think it was at this point we started to work [in a] more standardized [way]. It's important to have a structured way of working in projects like this. Today, we make [a] project plan and a gap analysis, and the traceability is important. We have also created a follow-up and of course some routines concerning training and the introduction of new staff [have] been improved (Quality Manager, Company Delta).

> We have protested at some point, and they have protested as well. These disagreements have resulted in a good relationship (CEO, Company Beta).

This kind of process clarifies roles and responsibilities and helps to identify important procedures throughout the order fulfillment process.

Category 4: communication to evaluate and learn

The suppliers retrospectively reflected about a lack of internal communication within their own organizations as well as externally in relation to customers. They stressed the need to learn from failures and spoke about a lack of reconciliation and evaluation during the order fulfillment process. They reflected on questions such as "What went wrong?", "How can we learn from this?", and "Maybe we need some kind of evaluation process?".

> We had to sit down and ask ourselves how it could have ended up like this (Project Manager, Company Alpha).

> When we had our evaluation interviews last week, we could see that the distribution of responsibility had been unclear. Who does what when we encounter problems? (Business Manager, Company Delta).

Such processes are a way of evaluating and learning from failure as well as success to improve procedures and communication internally and externally.

Learning about organizational learning in customization settings

The results uncovered four important categories of communication processes, involving learning by:

(1) the identification and confirmation of existing knowledge;
(2) the identification of knowledge gaps and creation of new knowledge;
(3) the definition of relations and procedures; and
(4) evaluation and learning.

The results of this study confirm the idea that customization requires the exploitation of existing knowledge, as Engström and Wikner (2017) mentions. It is also important to stimulate the exploration of new knowledge, not least when suppliers act as developers for

the customer. To manage the uncertainty of not knowing what to produce or manufacture in advance (Bertrand and Muntslag, 1993; Holweg and Pil, 2001), the suppliers in this study talked about defining relations and procedures to prepare for the process and clarify expectations. Because of the uncertainty of the individualized customization task, decision makers on each side need to process a large amount of information to reach a shared interpretation of what is to be done. This can be done by identifying knowledge gaps and learning what needs to be known for the task.

Learning by communicating to confirm existing knowledge (Category 1) can be likened to Egan's (2002) description of confirmatory feedback. It is a process of learning what existing knowledge each party holds when taking on the task. March and Simon (1958) consider feedback to be a coordination mechanism suitable for settings characterized by uncertainty, such as individualized customization (Bertrand and Muntslag, 1993). Egan (2002) also refers to correcting feedback, which has to do with Category 2, learning by communicating the creation of new knowledge. Here, the supplier and customer engage in dialogue to explore, learn, and understand more about the specific task. This can be facilitated by doing what Category 3 suggests: learning by communicating the definitions of relations and procedures. As the relationship between supplier and customer is usually new, this can support the establishment of a communication structure that facilitates collaborative efforts between the parties.

The four categories can also be identified in Watzlawick *et al.*'s (2011) levels of abstraction: The concrete level represents communication concerning the task as such – Categories 1 and 2. The abstract level, metacommunication, embraces Categories 3 and 4.

Two of the categories can be connected to Ellström's (2001) levels of learning and March's (1991) exploitation and exploration concepts. Category 1 involves exploitation, reproductive learning, and productive learning type 1. Category 2 relates to exploration, productive learning type 2, and creative learning. More complex tasks seem to occur when new products are to be developed, designed, or engineered, or when a supplier–customer relationship is completely new. In these situations, uncertainties and dependencies are prominent, placing high demands on learning.

Three of the categories found in this study are strongly related to Örtenblad's (2013) first three aspects of learning: learning at work, organizational learning, and climate for learning. They all relate to Categories 1 and 2, in which different types of knowledge are processed and to Category 4 where opportunities to question the work and learn from failures and mistakes are important. Category 3 and 4, identifies the importance of organized processes and procedures that also caters for transformation of the organization which Dixon (2017) emphasizes.

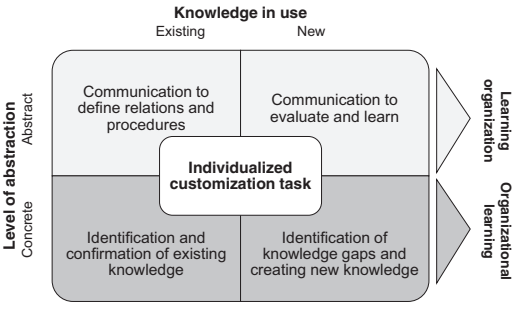

Figure 4.
Four categories of communication that play an important role in learning in individualized customization settings

Concluding remarks

This study responds to scholars' requests for organizational learning research conducted in proximity to practice. It argues that learning processes is centered in communication when dealing with tasks. These early steps in learning about organizational learning in customization settings suggest that more studies are needed on this topic.

The study has revealed four important categories of communication processes that play an important role in learning for suppliers of individualized customizations (Figure 4). Two of these, Categories 1 and 2, are at a concrete level of action where suppliers and their customers either communicate using existing knowledge or engage in dialogue and challenge each other to develop new knowledge. This confirms previous research on *organizational learning* that has identified the exploitation and exploration of knowledge in work processes that include different tasks.

The two other important communication categories are at a more abstract level and represent communication that creates conditions for learning. Categories 3 and 4 step back from practical action and adopt a more reflective and structural perspective on communication: the suppliers, internally or together with their customers, reflect, evaluate and agree on procedures, roles and responsibilities to facilitate task management. This can be related to the learning structures in *learning organizations*, which emphasize the importance of building routines and procedures that creates conditions for flexibility and empowerment of employees to communicate and handle complex tasks, such as individualized customization.

Figure 4 embeds these communication categories within the concepts of organizational learning and learning organization. This study has shown that the task of providing individualized customizations triggers organizational learning, but that organizations operating in customization settings cannot be content with that. They must strive to improve their procedures and organized processes for communication at an abstract level to strengthen their capability as a learning organization.

Organizational learning does not automatically result in a strong learning organization, but no organization can become a learning organization without organizational learning. For suppliers of individualized customizations, know-how need to be consolidated into the organization's memory as it can support in its ability to understand customers' needs. If suppliers succeed in this they will have great conditions for strengthening their capabilities as learning organizations, as each customer order can act as a trigger for organizational learning.

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