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The significance of knowledge readiness for co-creation in university industry collaborations

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ABSTRACT

This study explores value co-creation in university industry collaborations. The study is inspired by the constructivist approach to grounded theory and self-ethnography and based on interviews with 27 informants (eleven industry mentors and 16 academics) engaged in university industry collaborations. The findings suggest that co-creation depends on knowledge readiness and knowledge readiness develops through an interplay between temporary geographical and cognitive proximity. This study contributes to the existing literature on value co-creation, university industry collaborations, and proximity as follows: first, we shed light on the use of the co-creation perspective to enhance understandings of how value can be co-created in university industry collaborations. Second, we introduce the concept of knowledge readiness and demonstrate that co-creation in university industry collaborations between academics and industry mentors rests on knowledge readiness. Knowledge readiness concerns knowledge use and develops in the interplay between temporary geographical and cognitive proximity. We describe knowledge readiness as a sub-dimension of cognitive proximity. Knowledge readiness takes time to develop and is important for value co-creation and, subsequently, innovation in university industry collaborations.

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Value co-creation; knowledge readiness; proximity; innovation; university industry collaborations

Introduction

Collaboration between universities and the industry has received considerable attention from researchers for many years (Ankrah & Al-Tabbaa, 2015; Skute et al., 2019). This type of collaboration has been seen as important for regional knowledge spillovers and innovation (Mueller, 2006; Ponds et al., 2010). Such collaborative innovation processes can be described as co-creation when knowledge contributed by partners is used to create new value, e.g., products and services (Martínez-Cañas et al., 2016; Payne et al., 2008; Perks et al., 2012). A perspective on co-creation is rare in the university-industry literature, but such a perspective can contribute to opening up the black box of collaboration. I.e., what are the prerequisites for university-industry collaborations aiming to create value for both partners? We argue, in this study, for the usefulness of this perspective in exploring co-creation in collaborations between academics and industry actors.

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Partners in such collaborations come from different contexts, with different knowledge types and modes of innovation (Bjerregaard, 2010; Isaksen & Karlsen, 2010; De Wit-de Vries et al., 2019), which can limit innovation and value creation. In particular, tacit knowledge is difficult to use, because this type of knowledge is less accessible than other types of knowledge (Nonaka & Konno, 1998).

Considering the fact that innovation is a collaborative process (Greer & Lei, 2012; Magnusson et al., 2003; Roser et al., 2013) understanding the potential for knowledge use, particularly use of tacit knowledge, to innovate becomes pertinent. However, this perspective on knowledge as an accessible input in innovation processes fails to address what makes actors capable of using accessible knowledge. Considering the fact that universities, as knowledge providers, are linked to regional development at a larger scale (Karlsen et al., 2017), knowledge of what enables industry actors to use knowledge is crucial in realising innovation potential in university-industry collaborations. This brings us to the concept of co-creation, which describes processes in which producers, users, companies and external actors collaborate to create new value (Payne et al., 2008; Tekic & Willoughby, 2019; Vargo et al., 2008). The value co-creation literature conceptualises innovation as one potential outcome of the 'co-creation or collaborative recombination of practices that provide novel solutions for new or existing problems' (Vargo et al., 2015, p. 70), involving 'the joint creation of value by the firm and its network of various entities (such as customers, suppliers and distributors), which are termed actors' (Perks et al., 2012, p. 395). The knowledge process is central to innovating and creating value that can extend beyond dyadic levels (Frow et al., 2016; Perks et al., 2012; Vargo et al., 2015). This multilevel perspective considers knowledge to be an emergent process, with involved and committed actors interacting across levels to create value.

However, successful innovation requires a recognition of knowledge in use, i.e., the value that can be created based on accessible knowledge. In this study, knowledge use and co-creation is connected to collaborations between academics and industry actors. Given that the social context helps explain knowledge use, our study argues that for actors in university-industry collaborations to realise the knowledge potential embedded in knowledge-interaction processes, they must understand tacit knowledge; i.e., they must have an awareness of how they can integrate new knowledge and thus innovate.

In line with existing research (Broström, 2010; D'Este et al., 2013; Villani et al., 2017), we suggest that the concept of proximity (Boschma, 2005), i.e., how actors form connections to gain access to knowledge, is central to co-creation in university-industry collaborations. Our study suggests that the interaction between temporary geographical proximity, i.e., short- or medium-term visits in which the partners meet face-to-face (Torre, 2008, 2011), and cognitive proximity, i.e., a shared knowledge base (Boschma, 2005), is particularly important for knowledge creation in university-industry collaborations because these types of proximity facilitate knowledge exchanges (De Fuentes & Dutrénit, 2016; Garcia et al., 2018; Maietta, 2015). We argue that temporary geographical proximity is important in realising the innovation potential embedded in university-industry collaborations because of the tacit component of knowledge (Johnston, 2020; Villani et al., 2017). However, existing research emphasises that geographical proximity (permanent or temporary) is not sufficient for knowledge exchange (Boschma, 2005; Müller & Stewart, 2016; Torre & Rallet, 2005). In addition, while existing research has studied the interplay between temporary geographical proximity and organisational

proximity (Gilly et al., 2011; Torre, 2011), with regard to social and personal proximity (Werker et al., 2016), the interaction with cognitive proximity remains rather unexplored. Furthermore, the co-creation literature highlights knowledge as crucial to creating value. Hence, we focus on cognitive proximity and its interplay with temporary geographical proximity.

Based on the above, the aim of this study is to explore the following research question: *How does temporary geographical and cognitive proximity increase knowledge use and thereby enhance co-creation in university-industry collaborations?*

In the current study, we use a constructivist grounded theory approach (Charmaz, 2014), in combination with a self-ethnographical perspective (Alvesson, 2003), in which the focus is on interactive knowledge creation in university-industry collaboration. The empirical setting of this study is the collaboration between academics and industry actors in Norway through an arrangement labelled industry mentors. The study is structured as follows: the next section presents the theoretical background on proximity and value co-creation. The following sections present the method and the findings, before we discuss our findings, conclude and consider the implications for future studies.

Theoretical background

The notion of co-creation and the value of knowledge

The notion of value co-creation concerns actors' reasoning about their involvement in and contribution to their own value-creation processes (Lusch & Vargo, 2014; Vargo & Lusch, 2004), and it is increasingly used to describe various types of collaborations in which knowledge is considered key to the creation of value (Payne et al., 2008; Vargo et al., 2008). The focus is on knowledge use and how this creates value, i.e., value-in-use and value-in-context (Akaka & Parry, 2019; Chandler & Vargo, 2011; Edvardsson et al., 2011). Value-in-use concerns the use of knowledge to enact activities; value-in-context, meanwhile, concerns how culture, history, and socio-technical and situational factors influence how knowledge is used. It follows that viewing knowledge as an attainable resource for firms to use in innovation is too simplistic because it fails to consider knowledge use in context (Waluszewski & Håkansson, 2007).

In line with the logic of value co-creation (Lusch et al., 2016), Waluszewski and Håkansson (2007) argue that knowledge is only useful when it can increase the value of something that already exists, that is, when it can circulate and thus be combined and re-combined to create new value. Actors, e.g., individuals, firms, and organisations, are always embedded in larger structures and systems, which influence their ability to estimate the value of circulating knowledge for future value creation. This means that the potential for innovation depends on actors' ability to recognise knowledge and thus be able to act on it. In particular, knowledge is a process in which direct, indirect and unintended incidents can contribute to new ways of knowing (Nonaka & Konno, 1998).

Use of knowledge in university-industry collaborations

University-industry relationships include forms of collaborative innovation, which points to knowledge integration and use as essential (Greer & Lei, 2012; Kristensson

et al., 2004; Magnusson et al., 2003). Integrating different types of knowledge, as is the case in university-industry collaborations, is considered particularly advantageous because of the possibility of creating knowledge that cuts across mindsets. However, combining different types of knowledge highlights the possibility of a failure to integrate knowledge and use it due to a lack of understanding concerning this knowledge in terms of use and context.

We argue that to achieve knowledge integration in university-industry collaborations, partakers in knowledge-creation processes must take on an active role because active involvement is crucial for knowledge use (Lusch & Nambisan, 2015; Vargo & Lusch, 2004), particularly due to the tacit component of knowledge (Eklinder-Frick Jens, 2016; Nonaka & Konno, 1998; Nonaka & Takeuchi, 1995). We suggest that enabling knowledge access is not sufficient to realise the innovation potential present in university-industry collaborations, particularly because the vagueness of tacit knowledge makes it difficult to identify and use (D'Este & Patel, 2007; Nonaka & Konno, 1998; De Wit-de Vries et al., 2019).

The ability to use knowledge is crucial to developing new knowledge, which is at the core of innovation and future value creation (Nonaka, 1994; Nonaka & Konno, 1998)). The literature points to issues such as the use of lead users (Baldwin & von Hippel, 2011; Von Hippel, 1986); the way participants are involved in innovation projects; and how their competencies are identified, valued, and included (Christensen et al., 2017; Pals et al., 2008) as influencing the success of knowledge integration in collaborative innovations. The concept of co-creation focuses on actors collective actions and combined ability to act on knowledge to create value. Through co-creation, actors expand their opportunities for knowledge integration and innovation by increasing the cognitive space for innovation (Akaka et al., 2017; Christensen et al., 2017), including their ability to recognise the value of knowledge that enables and facilitates innovation.

Temporary geographical and cognitive proximity

Temporary geographical proximity is explained as short- or medium-term visits in which the partners meet face-to-face (Torre, 2008, 2011). The contextual nature of knowledge, e.g., tacit knowledge (Vallance, 2011; Vissers & Dankbaar, 2013), highlights the importance of some form of geographical proximity because actors from different contexts may perceive the value of knowledge differently. Temporary geographical proximity can create favourable conditions for interactions that facilitate the use of tacit knowledge (Müller & Stewart, 2016; Torre, 2008). To innovate in short-term collaborations, more frequently physical interactions between the partners is needed, while this is not considered equally important when collaborating across geographical distances for a long period of time (Broström, 2010).

Cognitive proximity, e.g., shared knowledge bases, are considered essential to enable future knowledge creation in university-industry collaborations because it influences knowledge sharing directly (Boschma, 2005; Molina-Morales et al., 2014) and creates a mutual understanding between university and industry partners (Lauvås & Steinmo, 2019). This implies that actors that are cognitively proximate may not depend on being geographically close to create value, because access to knowledge, e.g., reports, models, and drawings, contributes to knowledge use. In university-industry collaborations, the

nature of academic and industry knowledge, particularly in terms of tacit knowledge, can create barriers to innovation and value co-creation (De Wit-de Vries et al., 2019). Hence, we argue that cognitive proximity is key to integrating the theoretical knowledge from universities with the more experience-based knowledge from industry.

Further, co-creation in university-industry collaboration places the interplay between temporary geographical and cognitive proximity at the very centre of value creation. This is in line with the literature suggesting that, over time, temporary geographical and cognitive proximity enables collaborative innovation through the development of platforms that facilitate value creation and innovation (Balland et al., 2015; Boschma, 2005; Torre, 2008). In fact, knowledge integration rests on a minimum level of cognitive overlap, with temporary geographical proximity being argued to play a supportive role (Boschma, 2005; Santos et al., 2020; Torre, 2008). Recent research demonstrate that for academics in relationships with industry partners, temporary face-to-face contact, in combination with modern communication tools, is crucial to overcoming cognitive distance (Werker & Ooms, 2020). On the other hand, research also demonstrates that cognitive proximity is a substitute for geographical proximity in stimulating long-distance collaboration (Garcia et al., 2018). However, how the interplay between temporary geographical and cognitive proximity can increase knowledge use and co-creation in university-industry collaboration is not clear.

Method

Research design

To answer our research questions about how geographical and cognitive proximity can increase knowledge use and enhance value co-creation in university-industry collaboration, we have used a qualitative approach combining the constructivist version of grounded theory (Charmaz, 2014) and a self-ethnographical perspective (Alvesson, 2003). In addition, we have attempted to make our research as transparent as possible (Aguinis & Solarino, 2019). Grounded theory consists of systematic and flexible guidelines for collecting and analysing data to develop theories 'grounded' in the data themselves (Glaser & Strauss, 2017). Constructivist grounded theory includes researchers' and participants' experiences and views the findings as constructed rather than discovered, which is useful when theoretical concepts are deployed to explore research ideas in a dynamic way (Charmaz, 2014). Both authors are employed at one of the universities involved in this study and collaborate with industry mentors; thus, both researchers are insiders who share experiences with the study participants (Berger, 2013). We see this as a self-ethnographic approach (Alvesson, 2003; Brannick & Coghlan, 2007), which draws attention to our experiences in the organisational context rather than our deeply personal experiences (Alvesson, 2003). As academics interacting with industry actors, we have experiences that allow us to build on in-depth direct knowledge (Bleiklie et al., 2015), which can enrich the data and, as such, improve this study's reflections, quality, and resonance (Alvesson, 2003; Brannick & Coghlan, 2007; Charmaz, 2014). However, care must be taken to avoid pre-understandings stagnating into prejudices and restricting reflection and exploration. We have therefore strived to be as transparent as possible in our research, and according to the criteria suggested by Aguinis and Solarino

(2019), we have described our qualitative research and design and our roles as insiders. In addition, we will explain the selection of informants and their relative importance, data collection, the saturation point, and how we analysed the data.

Participant selection and data collection

The participants in the study were selected based on current or recent employment as industry mentors and academics at UiT, The Arctic University of Norway, and Nord University. The overview of the industry mentors hired at the two universities is limited due to the number of short-time contracts, various application procedures, and differences in how the mentor positions were financed. However, based on our own knowledge, secondary sources (i.e., webpages and newspaper articles), and referrals from participants, we have identified 25 persons in such positions. We applied a purposive sampling procedure based on a desire for variation related to industries and academic disciplines, and we selected eleven industry mentors and 16 of their academic counterparts for interviews (see an overview in Table 1).

The industry mentors were engaged in adjunct positions at the universities. In these positions, their roles were related to activities taking place at the universities (mainly teaching and supervising but also research and consultancy) and companies (arranging company visits, excursions, and other practice-related activities for the students), as well as activities connecting the industry and academia (work as door openers, information carriers, and translators). Outside the university, nine of the industry mentors were entrepreneurs from local or national private companies, and two had types of expertise that were particularly interesting for the university department. Our key informants were Industry Mentors B and C because we have collaborated with them ourselves. The selected academic participants were involved in close collaborations with industry mentors over time. The interviews were loosely structured and conducted over a two-year period (May 2017 to May 2019). In total, 27 participants were interviewed through 22 semi-structured interviews, three of which were group interviews, four of which were Skype interviews, and four of which were telephone interviews. The length of the interviews varied from 45 to 90 minutes. All interviews were audiotaped and transcribed. After these 22 interviews, we felt that we had reached a saturation point (Corbin & Strauss, 2008), beyond which little new insight into the proximity dimensions and co-creation in the collaboration between industry mentors and academics was added.

Data analysis

Our paper follows a semi-inductive approach, using our research question and the concepts of proximity and value co-creation as a point of departure for the data analysis (Charmaz, 2014). As such, our paper has *a priori* conceptualisations anchored in research on proximity and value co-creation, which has influenced the coding of the data. The analysis began by coding the data from the interviews using NVivo 12 Plus. We conducted two rounds of coding, one initial and one focused. The initial coding round was based on the research question, which meant that we arranged the data into broad categories to identify proximity, knowledge use, and co-creation. In the second and focused coding round, new categories linked to our initial codes but with improved

Table 1. Overview of participants.

Industry mentors	Academics	Industry/Academic discipline	Industry mentor's employment period	Industry mentors employment in %
Industry mentor A	Academic-1	Tourism	2016 (one year)	20
	Academic-2			
	Academic-3			
	Academic-4			
	Academic-5			
Industry mentor B	Academic-6	Food industry/Business & management	2016–2018	20
	Academic-7		2019 – ff	10
	Academic-8			
Industry mentor C	Academic-6	Manufacturing/Business & management	2015 – ff	10
	Academic-7			
	Academic-8			
Industry mentor D	Academic-9	Construction/Engineering	2016 (one year)	20
Industry mentor E	Academic-10	Fisheries	2015–2017	20
Industry mentor F	Academic-10	Consulting/Interdisciplinary	2019 – ff	20
Industry mentor G	Academic-11	Mining/Geology	2016–2018	10
Industry mentor H	Academic-12	Shipping/Engineering	2016–2018	20
Industry mentor I	Academic-13	Engineering/Business & management	2014–2017	20
Industry mentor J	Academic-14	Energy/Business & Management	2005–2017	20
	Academic-15		2017 – ff	40
	Academic-16			
Industry mentor K	Academic-14	Energy/Business & Management	2008 – ff	20
	Academic-15			
	Academic-16			

theoretical centrality were constructed (Charmaz, 2014). For instance, the category 'knowledge readiness' subsumed the initial categories of 'knowledge and context', 'recognise knowledge', 'acknowledge knowledge', and 'knowledge about'. In addition, the categories 'meet and greet', 'meeting places', and 'historical closeness' indicate geographical proximity, while the categories 'communicate knowledge', 'needed competence', and 'recombine knowledge' indicate cognitive proximity.

Findings

Value co-creation in university industry collaborations revolves around knowledge use, i.e., the fact that partners who are collaborating are actively involved in knowledge activities, during which they gain knowledge that is used to create value. For instance, both academics and industry mentors agree that to understand how knowledge can be used by each individual partner, is essential to further knowledge creation and growth. In the following sub-sections, we describe the key findings from the interviews.

Temporary geographical and cognitive proximity

The informants in this study offered the view that temporary geographical proximity is essential in mediating cognitive proximity; for instance, the two industry mentors believe that understanding the potential of academic knowledge for value creation in industry requires face-to-face meetings because these meetings provide a solid foundation on which to develop cognitive proximity.

> *They (academics) have a type of competence that is important for the industry, is important that the industry understands. Moreover, how can they communicate this competence? It is of no use to refer to books; it has to be communicated where academia meets industry. However, how to organize – seminars, symposiums?* (Industry Mentor K)

> *Value creation is anchored in discussions where we first meet to share stories about who we are and then we make suggestions of themes linked to academic subjects and our experiences. After this, we have something to build on and understand better what and how we can share and use our knowledge.* (Industry Mentor F)

The importance of temporary geographic proximity is also reflected in the following quote: '*For me, as a person from academia, it is essential that I go around and meet people as much as possible*' (Academic 1). This academic was unfamiliar with the local and regional industry and thought it essential to meet face-to-face to establish a cognitive foundation for future interactions. While temporary geographical proximity, in terms of having meeting places in which actors can meet face-to-face, seems to facilitate future interactions through, e.g., digital platforms, geographic proximity is considered by some industry mentors to be essential in developing the knowledge that the region needs: '*We need to have academic institutions physically close to facilitate recruitment to the industry that the industry needs*' (Industry Mentor I). This means that '*more students with a PhD are working in the industry*' (Industry Mentor I). It can be difficult to recruit young people from larger cities to knowledge-intensive industries in rural areas. These industry mentors thought it fundamental to have some form of geographic proximity to academic knowledge institutions and thus facilitate the recruitment of students with relevant

knowledge who are from the area. Relevant knowledge was also described as essential by one academic (Academic 9), who said that the knowledge that industry mentors can contribute to help students is very important. This industry mentor was also active in a group planning the course curriculum. This group was central in the development of new educational courses. The work in this group entailed regular face-to-face meetings over two years. In addition, the majority of the industry mentors in the studied region work in SMEs. Traditionally, SMEs in this region have had little interaction with knowledge institutions; hence, geographic proximity, in itself, has had a limited effect on knowledge transfers.

> *If you consider history, then it is obvious. The oldest university in this region is 50 years old, while the University in Oslo was established in the 1790s or around that time. It is the same with NTNU. In addition, the alumni linked to these are stronger. Therefore, these regions have older structures; they have stronger spatial links to organizations, institutions, and the industry*. (Industry Mentor F)

Regions with a history of collaborating with universities are perceived to be better equipped to initiate collaborations with universities because they have experience with this type of collaboration. Academic 14 said, '*When there is not a tradition if it (collaborating with industry), it is difficult to start working to establish such collaborations*' and '*We (universities and industries in the studied region) have more issues separating us than binding us together, and we need time to create activities that bind us*' (Industry Mentor J). This lack of experience has hampered co-creation. For industry mentors, the interplay between temporary geographical and cognitive proximity in acting on knowledge is clear.

> *We have to educate the young generation, those who are enrolled in universities now and will have positions in the future, to see the positive aspects of being located and doing business in north Norway, how you can do business in north Norway and what it is that makes north Norway different*' (Industry Mentor C).

Two of the industry mentors in our study found collaborations with academics necessary to new ways of thinking, i.e., innovation and enhanced value creation: '*We are unable to get there unless we can use research and rethink; thus, we think it is to our advantage to have local actors with us on such a journey*' (Industry Mentor I). Also, the use of knowledge is linked context: '*He (*industry mentor D*) contributed to a better discussion about the context, on what the industry finds interesting, which shed light on new research possibilities for us*' (Academic 9).

To sum up, the interplay between temporary geographical and cognitive proximity is essential in enabling actors to construct new sense-making frames that will enable them to realise the knowledge potential embedded in relationships with academics/industry mentors. This can be viewed as reaching a higher cognitive level that strengthens the integration and use of knowledge, which fuels future co-creation processes. We describe this as a precondition, which we call knowledge readiness, for knowledge management.

Knowledge readiness

Our data show the importance of temporary geographical and cognitive proximity for value co-creation and innovation over time. Moreover, our findings suggests that the interplay between these forms of proximity creates knowledge readiness. We suggest

knowledge readiness as a sub-dimension of cognitive proximity. For example, the co-supervision of graduate students can be viewed as a co-creation process facilitated by knowledge readiness. When co-supervising, academics and industry mentors meet and spend time together on a regular basis, during which they discuss, negotiate, and reflect on knowledge, i.e., knowledge types meet and are applied in a particular context. Co-supervision takes time, which allows for an expansion of the cognitive space for innovation (Akaka et al., 2017; Christensen et al., 2017) and. Hence, facilitates co-creation and knowledge use, e.g., for future innovation (Dahlin et al., 2019; Kristensson et al., 2004; Magnusson, 2009).

Other examples that show knowledge readiness in a different light are new course development and research projects. Academics and industry mentors who participate new course development and/or research are involved in knowledge creation processes for the future, i.e., ensuring that the region is prepared to leverage future opportunities for innovation and value co-creation. As with co-supervision, these processes are characterised by discussions, negotiations, and reflections on knowledge (developing knowledge readiness).

Discussion

Knowledge readiness

Readiness, as a concept, is linked to individuals' and/or organisations' ability to absorb or manage knowledge to succeed in, e.g., change or innovation processes (Cohen & Levinthal, 1990; Mohammadi et al., 2009; Van Wijk et al., 2008) and their ability to identify and use knowledge in new ways (Dahlin et al., 2019; Kristensson et al., 2004). Our study points in particular to a lack of understanding about the contextual element of knowledge, as in tacit knowledge, as a barrier to knowledge integration between universities and industry. Industry mentors often underestimate the value of academic knowledge, and vice versa because of the unfamiliarity connected to knowledge use. Because tacit knowledge is argued to be key for organisations' knowledge creation (Nonaka & Konno, 1998), a lack of understanding on the part of universities in particular can reduce the realisation of the region's knowledge potential and, subsequently, innovation.

Based on this and our empirical findings, we describe the state of actors' readiness to act on knowledge as knowledge readiness. Activities in which actors feel they can contribute equally with their expertise facilitates the development of knowledge readiness. In line with research describing the ability to identify and absorb knowledge (Dahlin et al., 2019; Mohammadi et al., 2009), our study view knowledge readiness as a precondition that facilitates the unfolding of actors' collective knowledge contributions in context, i.e., the co-creation of value and innovation (Frow et al., 2015; Greer & Lei, 2012). Furthermore, once established, knowledge readiness can, over time, increase the speed of knowledge creation in the region, e.g., by facilitating the development of new university courses that better suit the needs of the region or contributing to projects and research and thus strengthening regional knowledge creation. Relating cognitive proximity to context and time through knowledge readiness can be important in strengthening innovation and value creation in university industry collaborations.

The creation of knowledge readiness

This study suggests that knowledge readiness is created in the interplay between temporary geographic and cognitive proximity. Knowledge readiness facilitates co-creation, along with the subsequent creation of new knowledge that can enhance value creation and/or innovation. The co-supervision of graduate students and participation in the development of new courses and research projects are examples of activities that contribute to the creation of knowledge readiness, which, in turn, contributes to establishing platforms for co-creation (Frow et al., 2015).

In line with literature on temporary geographical and cognitive proximity (Torre, 2008, 2011; Vissers & Dankbaar, 2013), our study finds that temporary geographic proximity alone is not sufficient for knowledge readiness to be developed. Still, temporary geographic proximity is important in initiating knowledge readiness because academics and industry mentors can obtain information about their own knowledge use. Academics and industry mentors' knowledge types differs (De Wit-de Vries et al., 2019), and meeting to explore how knowledge is used in these two contexts increases the likelihood that the actors can identify and visualise how knowledge can be integrated and used to create something new. Knowledge readiness helps them to understand the value of knowledge and thus engage in co-creation processes with other actors, which can result in new activities and the creation of new knowledge. This means that temporary geographical proximity matters most during the initial phase of the collaboration process.

In line with the existing literature, we confirm that partners who are more cognitively close but geographically distant are better able to take advantage of accessible knowledge because they partly understand one another's knowledge contributions (Molina-Morales et al., 2014; Rosenkopf & Almeida, 2003). While this facilitates collaboration, it is inadequate for co-creation. Scant contextual understanding limits value creation and innovation. While our study shows that actors with different knowledge types must, first, understand this difference and, second, understand the relationship between the contexts of the knowledge dispersed in these collaboration processes, we suggest that also actors who have some cognitive overlap can benefit from the creation of knowledge readiness.

The importance of knowledge readiness for co-creation

Our study illustrates that once knowledge readiness is established, the interplay between geographic and cognitive proximity increases the realisation of the knowledge potential that is embedded in the context when knowledge is used to create value-in-use and value-in-context (Akaka & Parry, 2019; Vargo et al., 2020). It is difficult for academics and industry mentors to realise the knowledge potential embedded in university-industry collaborations. Knowledge readiness can facilitate knowledge creation in university-industry collaborations through co-creation and the creation of value for end users, e.g., value-in-use and value-in-context (Akaka et al., 2017; Magnusson et al., 2003; Van Wijk et al., 2008). Our findings show that the potential for value creation is, in part, contextual and that academics and industry mentors must understand how knowledge is contextualised to realise this potential. The importance of including context with regard to value creation is discussed in the literature on knowledge creation (Hautala & Höyssä,

2017; Hautala & Jauhiainen, 2014) and collaborations between universities and entrepreneurs (Hytti et al., 2015). Knowledge readiness, like other sub-dimensions of cognitive proximity (Huber, 2012), can enhance knowledge integration between partners in university-industry collaborations because it enables them to act on knowledge.

Knowledge readiness, innovation, and value co-creation

We argue that knowledge readiness is particularly important for actors in university-industry collaborations because of the current focus on universities' third mission, i.e., as an active participant in regional development processes (Karlsen et al., 2017). Our study argues that creating knowledge readiness among academics and industry actors in these regions is an important contribution to this endeavour. For instant, knowledge readiness can broaden the scope of action for both industry actors and academics in terms of expanded opportunities for innovation and new research in the region (Akaka et al., 2017; Dahlin et al., 2019; Perks et al., 2012). In addition, fast-paced global knowledge changes mean that actors who are able to interpret, integrate, and use knowledge quickly are in a better position to be innovative. For universities, this means outdated educational activities with diminishing student applications, while for industry actors and regions, it often means reduced value creation and increased unemployment. This can have detrimental effects on organisations' ability to think new thoughts and conduct the other business and research activities needed to sustain and/or develop regional value creation.

Conclusions, implications, and future research

By studying the relationship between academics and industry mentors, this study enhances our understanding of how context, or tacit knowledge, is woven into the interplay between temporary geographical and cognitive proximity, as well as how this strengthens the realisation of actors' knowledge potential with regard to subsequent innovation. Moreover, this study proposes that knowledge about the context, or knowledge readiness, is a sub-dimension of cognitive proximity that facilitates co-creation. This can be considered a precondition for value co-creation because partners in university-industry collaborations are more likely to understand the value of knowledge and, as such, contribute to realising the potential embedded in partners' knowledge to create value. Hence, the key contribution in this study is twofold. First, we shed light on the use of the co-creation perspective to enhance understandings of how value can be co-created in university-industry collaborations. Second, we demonstrate that co-creation in university-industry collaborations between academics and industry mentors rests on knowledge readiness, which concerns knowledge use and develops in the interplay between temporary geographical and cognitive proximity. As such, this study clarifies the factors linked to knowledge as a primary resource for value co-creation and highlights areas of concern in terms of the interplay between temporary geographic and cognitive proximity in university-industry collaborations.

Our findings have practical implications for universities and industry actors seeking to collaborate to create value. For industry actors, the findings suggest that, to co-create value, they must invest effort into activities in which they have the opportunity to meet face-to-face and work together on actual projects with academics because this will help

them to develop knowledge readiness. Over time, they will be able to use knowledge readiness to engage in value co-creation processes. For universities, the findings suggest that universities must work with industry on a long-term basis to create levels of knowledge readiness among academics that enable academics to make use of industry knowledge to enhance the value of their own activities. By carefully building knowledge readiness, both academics and industry mentors can spot opportunities for knowledge use that create value-in-use and value-in-context (e.g., contributing to strengthening and diversifying local and regional knowledge readiness to increase the future scope of action and thus realise local and regional attractiveness and value co-creation potential). This creates new and mutually beneficial traditions and a culture of future value creation. Our findings also have value for policy actors, particularly when they are designing funding schemes to increase university-industry linkages and regional value creation. Our findings suggest that, for example, the criteria for funding must be thought of as contextually constructed, which indicates a move on the part of future funding schemes away from uniform national standards to better match the knowledge potential in, e.g., local/regional contexts.

One limitation of this study is that we have addressed the empirical context of northern Norway, in which this study takes place in a limited geographic context. We believe that this rural context, characterised by long geographical distances between actors; young, small, and decentralised universities; and an industry consisting of many SMEs, may be important for understanding proximity and co-creation in university-industry collaborations. However, further research is needed to discover more about the influence of specific regional characteristics on this type of collaboration. Hence, one should be careful regarding the generalisability of our results to other contexts. More work is needed to verify the proposed findings in theoretical and practical contexts that can contribute to enhanced generalisability. The study's findings also show the necessity of extended empirical research on the relationship between geographic proximity, cognitive proximity, knowledge, and value co-creation in university-industry collaborations and other types of collaborations in which different types of knowledge are considered critical in creating value. Extended empirical research can contribute with deeper insights into knowledge readiness in terms of value co-creation.

Future studies on knowledge readiness could also investigate how knowledge readiness influences resilience. Resilience is linked to an increased ability to tackle a variety of challenges (Billington et al., 2017), and the relationship between resilience and knowledge readiness could therefore be an interesting avenue for future studies to explore. Research in rural areas is of particular importance because measures to enhance innovation and value creation in such areas often are based on findings with little contextual relevance. Furthermore, knowledge readiness can also be an interesting concept in terms of tackling the unknown. We live in a complex world, and actors must often tackle challenges for which they have not prepared, e.g., the current global crisis linked to COVID-19. Can knowledge readiness and value co-creation be useful perspectives in this sense? In addition, creating knowledge readiness between actors with different knowledge types takes time. While the literature discussing the role of proximity for value creation often views knowledge as a process detached from time, recent research has discussed time in relation to geographical and cognitive proximity (Hautala & Jauhiainen, 2014). Hautala and Höyssä (2017) link time, knowledge, and micro-scale

knowledge interpretation and suggest that time empowers knowledge to flow between actors at a micro level. More research is needed to understand the relevance of time for knowledge readiness and value co-creation. To gain an in-depth understanding of how time works with the dimensions of proximity – and the meaning of this interplay for knowledge readiness and value co-creation – we suggest that future research could benefit from being undertaken in the form of longitudinal studies.

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References

Aguinis, H., & Solarino, A. M. (2019). Transparency and replicability in qualitative research: The case of interviews with elite informants. *Strategic Management Journal*, *40*(8), 1291–1315. https://doi.org/10.1002/smj.3015

Akaka, M. A., Vargo, S. L., & Wieland, H. (2017). Extending the context of innovation: The co-creation and institutionalization of technology and markets. In T. Russo-Spena, C. Mele, & M. Nuutinen (Eds.), *Innovating in practice: Perspectives and experiences* (pp. 43–57). Springer International Publishing. https://doi.org/10.1007/978-3-319-43380-6_3

Akaka, M. A., & Parry, G. (2019). Value-in-context: An exploration of the context of value and the value of context. In P. P. Maglio, C. A. Kieliszewski, J. C. Spohrer, K. Lyons, L. Patrício, & Y. Sawatani (Eds.), *Handbook of service science, volume II* (pp. 457–477). Springer International Publishing. https://doi.org/10.1007/978-3-319-98512-1_20

Alvesson, M. (2003). Methodology for close up studies–struggling with closeness and closure. *Higher Education*, *46*(2), 167–193. https://doi.org/10.1023/A:1024716513774

AnkrSAnkrah, S., & Al-Tabbaa, O. (2015). Universities–industry collaboration: A systematic review. *Scandinavian Journal of Management*, *31*(3), 387–408. https://doi.org/10.1016/j.scaman.2015.02.003

Baldwin, C., & von Hippel, E. (2011). Modeling a paradigm shift: From producer innovation to user and open collaborative innovation. *Organization Science*, *22*(6), 1399–1417. https://doi.org/10.1287/orsc.1100.0618

Balland, P.-A., Boschma, R., & Frenken, K. (2015). Proximity and innovation: From statics to dynamics. *Regional Studies*, *49*(6), 907–920. https://doi.org/10.1080/00343404.2014.883598

Berger, R. (2013). Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. *Qualitative Research*, *15*(2), 219–234. https://doi.org/10.1177/1468794112468475

Billington, M. G., Karlsen, J., Mathisen, L., & Pettersen, I. B. (2017). Unfolding the relationship between resilient firms and the region. *European Planning Studies*, *25*(3), 425–442. https://doi.org/10.1080/09654313.2016.1276886

Bjerregaard, T. (2010). Industry and academia in convergence: Micro-institutional dimensions of R&D collaboration. *Technovation*, *30*(2), 100–108. https://doi.org/10.1016/j.technovation.2009.11.002

Bleiklie, I., Enders, J., & Lepori, B. (2015). Organizations as penetrated hierarchies: Environmental pressures and control in professional organizations. *Organization Studies*, *36*(7), 873–896. https://doi.org/10.1177/0170840615571960

Boschma, R. (2005). Proximity and innovation: A critical assessment. *Regional Studies*, *39*(1), 61–74. https://doi.org/10.1080/0034340052000320887

Brannick, T., & Coghlan, D. (2007). In defense of being "native": The case for insider academic research. *Organizational Research Methods*, *10*(1), 59–74. https://doi.org/10.1177/1094428106289253

Broström, A. (2010). Working with distant researchers—Distance and content in university–industry interaction. *Research Policy*, *39*(10), 1311–1320. https://doi.org/10.1016/j.respol.2010.09.002

Chandler, J. D., & Vargo, S. L. (2011). Contextualization and value-in-context: How context frames exchange. *Marketing Theory*, *11*(1), 35–49. https://doi.org/10.1177/1470593110393713

Charmaz, K. (2014). *Constructing Grounded Theory* (2nd ed.). SAGE.

Christensen, P. R., Munksgaard, K., & Bang, A. L. (2017). The wicked problems of supplier-driven innovation. *Journal of Business & Industrial Marketing*, *32*(6), 836–847. https://doi.org/10.1108/JBIM-06-2015-0110

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, *35*(1), 128–152. https://doi.org/10.2307/2393553

Corbin, J., & Strauss, A. (2008). Strategies for qualitative data analysis. *Basics of Qualitative Research. Techniques and procedures for developing grounded theory*, 3.

D'Este, P., Guy, F., & Iammarino, S. (2013). Shaping the formation of university–industry research collaborations: What type of proximity does really matter? *Journal of Economic Geography*, *13*(4), 537–558. https://doi.org/10.1093/jeg/lbs010

D'Este, P., & Patel, P. (2007). University–industry linkages in the UK: What are the factors underlying the variety of interactions with industry? *Research Policy*, *36*(9), 1295–1313. https://doi.org/10.1016/j.respol.2007.05.002

Dahlin, P., Moilanen, M., Østbye Stein, E., & Pesämaa, O. (2019). Absorptive capacity, co-creation, and innovation performance: A cross-country analysis of gazelle and nongazelle companies. *Baltic Journal of Management*, *15*(1), 81–98. https://doi.org/10.1108/BJM-05-2019-0161

De Fuentes, C., & Dutrénit, G. (2016). Geographic proximity and university–industry interaction: The case of Mexico. *The Journal of Technology Transfer*, *41*(2), 329–348. https://doi.org/10.1007/s10961-014-9364-9

De Wit-de Vries, E., Dolfsma, W. A., van der Windt, H. J., & Gerkema, M. P. (2019). Knowledge transfer in university–industry research partnerships: A review. *The Journal of Technology Transfer*, *44*(4), 1236–1255. https://doi.org/10.1007/s10961-018-9660-x

Edvardsson, B., Tronvoll, B., & Gruber, T. (2011). Expanding understanding of service exchange and value co-creation: A social construction approach. *Journal of the Academy of Marketing Science*, *39*(2), 327–339.

Eklinder-Frick Jens, O. (2016). Clustering or interacting for knowledge? Towards an entangled view of knowledge in regional growth policy. *IMP Journal*, *10*(2), 221–242. https://doi.org/10.1108/IMP-08-2015-0042

Frow, P., McColl-Kennedy, J. R., & Payne, A. (2016). Co-creation practices: Their role in shaping a health care ecosystem. *Industrial Marketing Management*, *56*, 24–39. https://doi.org/10.1016/j.indmarman.2016.03.007

Frow, P., Nenonen, S., Payne, A., & Storbacka, K. (2015). Managing Co-creation design: A strategic approach to innovation. *British Journal of Management*, *26*(3), 463–483. https://doi.org/10.1111/1467-8551.12087

Garcia, R., Araujo, V., Mascarini, S., Gomes Dos Santos, E., & Costa, A. (2018). Is cognitive proximity a driver of geographical distance of university–industry collaboration? *Area Development and Policy*, *3*(3), 349–367. https://doi.org/10.1080/23792949.2018.1484669

Gilly, J. P., Talbot, D., & Zuliani, J.-M. (2011). Hub firms and the dynamics of territorial innovation: Case studies of Thales and Liebherr in Toulouse. *European Planning Studies*, *19*(12), 2009–2024. https://doi.org/10.1080/09654313.2011.632904

Glaser, B. G., & Strauss, A. L. (2017). *Discovery of grounded theory: Strategies for qualitative research*. Routledge.

Greer, C. R., & Lei, D. (2012). Collaborative innovation with customers: A review of the literature and suggestions for future research*. *International Journal of Management Reviews*, *14*(1), 63–84. https://doi.org/10.1111/j.1468-2370.2011.00310.x

Hautala, J., & Höyssä, M. (2017). Knowledge rationales in human geography: Economic, policy, empowerment, and methodological. *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography*, *71*(5), 269–287. https://doi.org/10.1080/00291951.2017.1340907

Hautala, J., & Jauhiainen, J. S. (2014). Spatio-temporal processes of knowledge creation. *Research Policy*, *43*(4), 655–668. https://doi.org/10.1016/j.respol.2014.01.002

Huber, F. (2012). On the role and interrelationship of spatial, social and cognitive proximity: Personal knowledge relationships of R&D workers in the Cambridge information technology cluster. *Regional Studies*, *46*(9), 1169–1182. https://doi.org/10.1080/00343404.2011.569539

Hytti, U., Lemmetyinen, A., & Nieminen, L. (2015). A value-creating framework for enhancing entrepreneurial learning in networks. *Journal of Enterprising Communities: People and Places in the Global Economy*,*9*(1), 76–91. https://doi/10.1108/JEC-04-2013-0012

Isaksen, A., & Karlsen, J. (2010). Different modes of innovation and the challenge of connecting universities and industry: Case studies of two regional industries in Norway. *European Planning Studies*, *18*(12), 1993–2008. https://doi.org/10.1080/09654313.2010.516523

Johnston, A. (2020). Open innovation and the formation of university–industry links in the food manufacturing and technology sector: Evidence from the UK. *European Journal of Innovation Management*, *24*(1), 89–107. https://doi.org/10.1108/EJIM-06-2019-0163

Karlsen, J., Beseda, J., Šima, K., & Zyzak, B. (2017). Outsiders or leaders? The role of higher education institutions in the development of peripheral regions. *Higher Education Policy*, *30*(4), 463–479. https://doi.org/10.1057/s41307-017-0065-5

Kristensson, P., Gustafsson, A., & Archer, T. (2004). Harnessing the creative potential among users*. *Journal of Product Innovation Management*, *21*(1), 4–14. https://doi.org/10.1111/j.0737-6782.2004.00050.x

Lauvås, T., & Steinmo, M. (2019). The role of proximity dimensions and mutual commitment in shaping the performance of university-industry research centres. *Innovation*, 1–27. https://doi.org/10.1080/14479338.2019.1662725

Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS Quarterly*, *39*(1), 155–175. https://doi.org/10.25300/MISQ/2015/39.1.07

Lusch, R. F., & Vargo, S. L. (2014). *Service-dominant logic: Premises, perspectives*,*possibilities*. Cambridge University Press.

Lusch, R. F., Vargo, S. L., & Gustafsson, A. (2016). Fostering a trans-disciplinary perspectives of service ecosystems. *Journal of Business Research*, *69*(8), 2957–2963. https://doi.org/10.1016/j.jbusres.2016.02.028

Magnusson, P. R. (2009). Exploring the contributions of involving ordinary users in ideation of technology-based services*. *Journal of Product Innovation Management*, *26*(5), 578–593. https://doi.org/10.1111/j.1540-5885.2009.00684.x

Magnusson, P. R., Matthing, J., & Kristensson, P. (2003). Managing user involvement in service innovation: Experiments with innovating end users. *Journal of Service Research*, *6*(2), 111–124. https://doi.org/10.1177/1094670503257028

Maietta, O. W. (2015). Determinants of university–firm R&D collaboration and its impact on innovation: A perspective from a low-tech industry. *Research Policy*, *44*(7), 1341–1359. https://doi.org/10.1016/j.respol.2015.03.006

Martínez-Cañas, R., Ruiz-Palomino, P., Linuesa-Langreo, J., & Blázquez-Resino, J. J. (2016). Consumer participation in co-creation: An enlightening model of causes and effects based on ethical values and transcendent motives. *Frontiers in Psychology*, *7*, 793. https://www.frontiersin.org/article/10.3389/fpsyg.2016.00793

Mohammadi, K., Khanlari, A., & Sohrabi, B. (2009). Organizational readiness assessment for knowledge management. *International Journal of Knowledge Management (IJKM)*, *5*(1), 29–45. https://doi.org/10.4018/jkm.2009010103

Molina-Morales, F. X., García-Villaverde, P. M., & Parra-Requena, G. (2014). Geographical and cognitive proximity effects on innovation performance in SMEs: A way through knowledge acquisition. *International Entrepreneurship and Management Journal*, *10*(2), 231–251. https://doi.org/10.1007/s11365-011-0214-z

Mueller, P. (2006). Exploring the knowledge filter: How entrepreneurship and university–industry relationships drive economic growth. *Research Policy*, *35*(10), 1499–1508. https://doi.org/10.1016/j.respol.2006.09.023

Müller, M., & Stewart, A. (2016). Does temporary geographical proximity predict learning? Knowledge dynamics in the Olympic Games. *Regional Studies*, *50*(3), 377–390. https://doi.org/10.1080/00343404.2014.917168

Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, *5*(1), 14–37. https://doi.org/10.1287/orsc.5.1.14

Nonaka, I., & Konno, N. (1998). The concept of "Ba": Building a foundation for knowledge creation. *California Management Review*, *40*(3), 40–54. https://doi.org/10.2307/41165942

Nonaka, I., & Takeuchi, H. (1995). The knowledge-creating company. Oxford university press.

Pals, N., Steen, M. G. D., Langley, D. J., & Kort, J. (2008). Three approaches to take the user perspective into account during new product design. *International Journal of Innovation Management*, *12*(3), 275–294. https://doi.org/10.1142/S1363919608002023

Payne, A. F., Storbacka, K., & Frow, P. (2008). Managing the co-creation of value. *Journal of the Academy of Marketing Science*, *36*(1), 83–96. https://doi.org/10.1007/s11747-007-0070-0

Perks, H., Gruber, T., & Edvardsson, B. (2012). Co-creation in radical service innovation: A systematic analysis of microlevel processes. *Journal of Product Innovation Management*, *29*(6), 935–951. https://doi.org/10.1111/j.1540-5885.2012.00971.x

Ponds, R., Oort, F. v., & Frenken, K. (2010). Innovation, spillovers and university–industry collaboration: An extended knowledge production function approach. *Journal of Economic Geography*, *10*(2), 231–255. https://doi.org/10.1093/jeg/lbp036

Rosenkopf, L., & Almeida, P. (2003). Overcoming local search through alliances and mobility. *Management Science*, *49*(6), 751–766. https://doi.org/10.1287/mnsc.49.6.751.16026

Roser, T., DeFillippi, R., & Samson, A. (2013). Managing your co-creation mix: Co-creation ventures in distinctive contexts. *European Business Review*, *25*(1), 20–41. https://doi.org/10.1108/09555341311287727

Santos, E. G., Garcia, R., Araujo, V., Mascarini, S., & Costa, A. (2020). Spatial and non-spatial proximity in university–industry collaboration: Mutual reinforcement and decreasing effects. *Regional Science Policy & Practice*, 1–13. https://doi.org/10.1111/rsp3.12312

Skute, I., Zalewska-Kurek, K., Hatak, I., & de Weerd-Nederhof, P. (2019). Mapping the field: A bibliometric analysis of the literature on university–industry collaborations. *The Journal of Technology Transfer*, *44*(3), 916–947. https://doi.org/10.1007/s10961-017-9637-1

Tekic, A., & Willoughby, K. (2019). Co-creation – Child, sibling or adopted cousin of open innovation? *Innovation*, *21*(2), 274–297. https://doi.org/10.1080/14479338.2018.1530565

Torre, A. (2008). On the role played by temporary geographical proximity in knowledge transmission. *Regional Studies*, *42*(6), 869–889. https://doi.org/10.1080/00343400801922814

Torre, A. (2011). The role of proximity during long-distance collaborative projects. Temporary geographical proximity helps. *International Journal of Foresight and Innovation Policy*, *7*(1–3), 213–230. https://doi.org/10.1504/IJFIP.2011.040075

Torre, A., & Rallet, A. (2005). Proximity and Localization. *Regional Studies*, *39*(1), 47–59. https://doi.org/10.1080/0034340052000320842

Vallance, P. (2011). Relational and dialectical spaces of knowing: Knowledge, practice, and work in economic geography. *Environment and Planning A: Economy and Space*, *43*(5), 1098–1117. https://doi.org/10.1068/a43186

Van Wijk, R., Jansen, J. J. P., & Lyles, M. A. (2008). Inter- and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences. *Journal of Management Studies*, *45*(4), 830–853. https://doi.org/10.1111/j.1467-6486.2008.00771.x

Vargo, S. L., Koskela-Huotari, K., & Vink, J. (2020). *Service-dominant logic: Foundations and applications*. Routledge.

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, *68*(1), 1–17. https://doi.org/10.1509/jmkg.68.1.1.24036

Vargo, S. L., Maglio, P. P., & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, *26*(3), 145–152. https://doi.org/10.1016/j.emj.2008.04.003

Vargo, S. L., Wieland, H., & Akaka, M. A. (2015). Innovation through institutionalization: A service ecosystems perspective. *Industrial Marketing Management*, *44*, 63–72. https://doi.org/10.1016/j.indmarman.2014.10.008

Villani, E., Rasmussen, E., & Grimaldi, R. (2017). How intermediary organizations facilitate university–industry technology transfer: A proximity approach. *Technological Forecasting and Social Change*, *114*, 86–102. https://doi.org/10.1016/j.techfore.2016.06.004

Vissers, G., & Dankbaar, B. (2013). Knowledge and proximity. *European Planning Studies*, *21*(5), 700–721. https://doi.org/10.1080/09654313.2013.734459

Von Hippel, E. (1986). Lead users: A source of novel product concepts. *Management Science*, *32*(7), 791–805. https://doi.org/10.1287/mnsc.32.7.791

Waluszewski, A., & Håkansson, H. (2007). Economic use of knowledge. In H. Håkansson & A. Waluszewski (Eds.), *Knowledge and innovation in business and industry:The importance of using others*.

Werker, C., & Ooms, W. (2020). Substituting face-to-face contacts in academics' collaborations: Modern communication tools, proximity, and brokerage. *Studies in Higher Education*, *45*(7), 1431–1447. https://doi.org/10.1080/03075079.2019.1655723

Werker, C., Ooms, W., & Caniëls, M. C. (2016). Personal and related kinds of proximity driving collaborations: A multi-case study of Dutch nanotechnology researchers. *SpringerPlus*, *5*(1), 1751. https://doi.org/10.1186/s40064-016-3445-1