



**HAL**  
open science

# Innovation Processes in Indigenous Communities in the North - Cultural, Psychological and Technological Knowledge in Practice

Eva Carlsdotter Schjetne, Synnøve Thomassen Andersen

► **To cite this version:**

Eva Carlsdotter Schjetne, Synnøve Thomassen Andersen. Innovation Processes in Indigenous Communities in the North - Cultural, Psychological and Technological Knowledge in Practice. 10th International Conference on Culture, Technology, and Communication (CATAC), Jun 2016, London, United Kingdom. pp.82-95, 10.1007/978-3-319-50109-3\_6. hal-01619327

**HAL Id: hal-01619327**

**<https://inria.hal.science/hal-01619327>**

Submitted on 19 Oct 2017

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

# Innovation processes in indigenous communities in the North - cultural, psychological and technological knowledge in practice

Eva Carlsdotter Schjetne, Psychologist,  
*UiT The Arctic University of Norway*  
Synnøve Thomassen Andersen, Ph.d.  
*UiT The Arctic University of Norway*

## Abstract

*The paper addresses psychological knowledge in innovation processes in rural areas in the North. The empirical base is the introduction of an innovation program realized through the University of the Arctic, a cooperative network of universities, colleges and other organizations committed to higher education and research in the North. We attempted to stimulate innovation in the rural villages of Northern Russia using workshops centred on building social capital through psychological knowledge. Our analysis shows that good family health and psychological knowledge among villagers is important for sustaining the innovation process in the North. We also found that technological infrastructure is a crucial but often lacking component in this process.*

**Keywords:** *psychological knowledge, social capital, innovation, technology, culture*

## 1 Introduction

The circumpolar region has unique challenges. The search for resilient and sustainable communities is shared by all the countries. The activities initiated through the Thematic Networks<sup>1</sup> under the University of the Arctic Aim at strengthening the cooperation between people with cross-border projects and shared practices. The area is sparsely populated, with long distances between settlements and administrative centres. Innovations and local solutions have to be culturally, economically and ecologically appropriate, the locals have to appreciate them and take them on as their own. An innovation process is understood not only as a technical, but also as a social process (Andersen, 2013). Further, innovation can only take place in extended and close cooperation between people, both within businesses and other institutions, and between institutions. Such cooperation is likely to require mutual trust and understanding (Andersen, 2013). Tödting (1994) claims that innovation and technological change are created from already existing knowledge and skills, and develop along specific paths. Knowledge and skills are found partly in local institutions and business environments, which can lead to the development of regional paths for innovation development. According to Valsiner (2001, 2005), there is a need for knowledge of psychology as a whole for the study

---

<sup>1</sup>Finnmark faculty UiT Norwegian Arctic University (Tromsø Norway) University of Northern British Columbia (Prince George Canada) University of Saskatchewan (Saskatoon, Canada) Saint Mary's University (Halifax, Canada) Centre of the Westfjords, Iceland, regional Sakha (Yakutian) partners: Institute of Research in Humanities and in Problems of Indigenous People of the Siberian branch of the Russian Academy of Sciences, the Northern Forum Academy and the Institute of Applied ecology of the North.]

of dynamic, meaning-making human beings. Use of psychological knowledge is necessary to understand innovation processes (Valsiner, 2001). For several decades there has been a varying focus on the involvement in different ways of users in development of new products and services, often including a description of users as sources of innovation (Von Hippel, 1986). New technological opportunities in the form of mobile units and increased individual user needs are two of the driving forces for this trend today. Information Communication Technologies (ICT) can only affect participation if they are readily available. To secure access to ICT is of a great significance for participation in society, as well as for the development of different public services such as healthcare, democratic processes etc. Mobile communications technology has become the world's most common way of transmitting voice, data, and services, and no technology has ever spread faster. Cellular telephone subscriptions are expected to reach 8 billion by 2016.

The study in this article is based on a project of the University of the Arctic<sup>2</sup> from 2009–2014<sup>3</sup>. Over the last six years, cooperation within the UArctic network grew closer between Thematic Network on Northern Governance and Development, resulting in a Forum for Northern Governance and Development. More villages have been included in the development work, and the project work will continue in the coming years. The use of technology has been an important factor in this work. With this contribution, we wish to amplify what happens during the development of innovation processes by creating a social partnership, uniting academics, villagers, and the use of technology when psychological aspects are taken into consideration. Among the participants in the project we discuss, was a group of scientists moved into the villages in Sakha Republic in Russia, and cooperated closely with municipality and regional administration and existing businesses in the area. In such activities, we claim that psychological knowledge can give helpful contributions in the innovation process with use of technology. It is essential to create an atmosphere of trust between the partners and actors in projects, since trust is the basis of innovation and creativity. Based on this the central research question of this article is:

*How can psychological knowledge contribute to the innovation processes with use of technology?*

We have problematized the psychological aspect in the context of this rural area. More specifically, this study shows how to use different psychological perspectives in the innovation process. We highlight the challenges in use of mobile technology in this perspective.

This article is structured as follows: first, a presentation of the theoretical frame (section 2), and thereafter, a presentation of the method and empirical basis in section 3. Section 4 present the analysis and discussion of the findings, followed by a conclusion of the article.

## 2 Theoretical frame

In this chapter, we will present our conceptual framework. We will begin with a brief discussion of psychological theory, which may offer better understanding of different psychological perspectives in the innovation process. Perspectives of social, cultural, and humanistic psychology can provide us with insights in how we can understand innovation

---

<sup>2</sup>UArctic is a cooperative network of universities; UiT, The Arctic University of Norway (Finnmark University College, Alta), North Eastern Federate University, Institute of Finance and Economics and Development Psychological Aid Centre, Yakutsk, Sakha republic, Russian Federation. The network also include colleges and other organisations committed to higher education and research in the north.

<sup>3</sup> In 2007, a bilateral agreement of cooperation was signed with Sakha State University, now North Eastern Federal University (NEFU), and Finnmark University College<sup>3</sup>. The frame of this cooperation was the Thematic Network on Local and Regional Development in the North, chaired by Finnmark University College and the joint scientific-education project "Innovative Development of the Northern Territories" chaired by the Institute of Finance and Economics (NEFU). The outcome of this agreement was the implementation of five different joint education, research and development projects in Yakutsk and rural Sakha (Yakutia) in Russia in the summer of 2009.

processes, for example how close cooperation with municipality and regional administration and existing businesses are key factors for successful innovation in rural area (Aarsæther, 2004). We will look closer at the concept of ICT which we have selected as part of our conceptual lens for the discussion and analysis.

## ***2.1 Social Capital Perspective***

Social capital refers to the social networks, informal structures and norms that facilitate individual and collective action. Most research on social capital refers to this original definition of the concept, which was made by Bourdieu (1986). Research over the last decades has given evidence that social capital has significant effects on the effectiveness and functioning of regional and national governance (Bærenholdt & Aarsæther, 2002; Ronnby, 1995, 2009; Sørensen & Torfing, 2006; Virkkala, 2007). Social capital of a community is assessed in three dimensions: a combination of bonding (relations within the community), bridging (relations with other communities) and linkage (relations with formal institutions) (Putnam, 2001). Putnam claims that economic growth, health and crime prevention are important sectors where action is desired. Lately there has been a growing interest in social capital and the impact on quality of life for the population. In health research, Åslund et.al. (2010) have analysed a large population of Swedish adolescents where low neighbourhood social capital and low general social trust were associated with higher rates of psychosomatic symptoms, musculoskeletal pain and depression. According to World Health Organization (WHO) (2004), depression heightens the risk for suicide. Research over the last years has found that the presence of social capital through social networks and communities has a protective quality on health (Ledogar & Fleming, 2008). Individuals who are embedded in a network or a community, rich in support, social trust and open information and clear norms, have resources that help them to achieve health goals. These factors can discourage individuals from engaging in risky health behaviours such as smoking and binge drinking, behaviours common in the northern regions (Bolin, Lindgren, Lindström, & Nystedt, 2003).

According to Bronfenbrenner (1979) psychological and behavioural factors point to what motivates individuals to engage in building social capital and how that engagement is maintained and improved. Such perspectives on social capital highlight psychological concepts and research as a contribution to community development practice. Bronfenbrenner (1979) claims that reframing of social capital theory, using a multi-level ecological system theory framework. Perkins, Hughly & Speer (2002), argue that this ecological framework provides an understanding how individual empowerment works.

## ***2.2 Cultural Psychology Perspective***

Cultural psychology plays an important role in understanding forces active in creating social capital (Perkins & Long, 2002). These include a variety of other positive community-oriented cognitions, such as communitarianism, place attachment, community satisfaction, pride of place and confidence in the future of one's community. A study among three indigenous communities in Manitoba, Canada has showed how a culture of trust, norms of reciprocity, collective action and participation along with inclusive, flexible and diverse networks are important qualities regarding social capital (Mignone & O'Neil, 2005). Shweder (1991) argues that we have to be prepared to have a critical attitude towards our own professional knowledge as well as to be sensitive to local knowledge traditions. To be aware of the cultural aspects in transference of not only psychological, but any theoretical knowledge, is necessary in our developmental projects. In the indigenous regions the primary industries like reindeer husbandry, fishing and hunting are closely connected to ethnic identity and spiritual life. Indigenous children that were separated from their families in Finnmark, Norway has expressed deep feelings of loss, not only regarding people but also nature and place (Hanssen,

2006). Thus place attachment is believed to lead people to stay and protect what they cherish most in their communities while mobilising to invest time, energy and money when the community future existence is threatened (Perkins et al., 2002).

### **2.3 Humanistic Psychology Perspective**

Humanistic psychology recognises that human existence consists of multiple layers of reality: the physical, the organic, the spiritual and symbolic and the phenomenological. The humanistic approach has its roots in phenomenological and existentialist thoughts, from Kierkegaard, Nietzsche, Heidegger to Merleau-Ponty and Sartre.

The holistic, multi-dimensional perspective of the Humanistic psychology has generated a wide variety of approaches that expand the range of options for dealing with psychological, psychosomatic, psychosocial and psycho-spiritual conditions. It is emphasized that psychotherapy is not only of value in dealing with bad mental health, but also in promoting good health and psychosocial wellbeing. In this range, we use the perspectives Salutogenetic and Resilience. Antonovsky (1979) describes the salutogenesis concept, how people survive, adapt and overcome severe life-stress experiences. Resilience is a related concept, the result of individuals being able to interact with their environments and the processes that either promote well-being or protect them against the overwhelming influence of risk factors. Rutter (2008) claims that these processes can be individual coping strategies, or may be helped along by good families, schools, communities and social policies that make resilience more likely to occur. According to Ledogar & Fleming (2008), resilience in indigenous regions, researchers of indigenous health relate to the impact of culture, history, community values and geographical settings.

### **2.4 Innovation in Information System Research**

For more than a decade, the Internet and use of PCs and mobile phones has been accessible to a large number of users and have provided a possibility to experiment with different forms of innovations, and users can both make and participate in innovation activities. The general understanding of innovation is more or less the same, although the definitions differ slightly. A general definition of innovation is: “*the introduction of something new, a new idea, method, or device*”, (Webster dictionary, online<sup>4</sup>). The sources of knowledge and innovation are both inside and outside of organizations and social drivers of innovation are important (von Hippel 1995; Tuomi, 2002, pp. 23–25). Users have a central role in shaping innovation processes, as they have a strong influence on the social side of innovations, modifying and improving the products, helping to shape technology in all its phases (Tuomi, 2002, p. 4). Tuomi (2002, p. 21) claims that technology exists as technology-in-use in the context of a specific practice, and that the starting point for innovation studies therefore must be on the social practical level. Christensen and Bower (1996) claim that various types of innovations involves changes in the application of ICT. Swanson and Ramiller (2004, p. 536) define innovation in technology as “*...the pursuit of IT applications new to the organization*”, while Swanson (1994, p. 1072) defines it as “*...the organizational application of [...] Information Technology*”. Resembling other types of innovation, IT innovation development is based on different sources that cover a wide range of activities in the IT value chain implying that an information system innovation must traverse through a complex ecology of multiple types of innovative events (Swanson 1994; Lyytinen & Rose, 2003 a,b). Lyytinen and Rose (2003) claim that ICT innovation is “*the creation and new organizational application of digital computers and communication technologies*”. Innovation and technological development has—to a much larger degree—been viewed because of relationships, networks and knowledge

---

<sup>4</sup>[http://oxforddictionaries.com/definition/american\\_english/innovate](http://oxforddictionaries.com/definition/american_english/innovate) 2013-03-20

exchange between actors and, internally as well as externally, in an organization (Andersen, 2013).

### 3 Research Method

The research method used in this research is case study in the interpretative tradition. Qualitative research methods are used to understand and explain the social phenomena related to psychological knowledge in the innovational process. This research approach enabled one of the authors to describe and understand personal meaning, social phenomena and the experiences from people through data collecting methods such as interviews and observations in its natural environments (Repstad, 1998; Thagaard, 2004). By focusing complexity within human understanding according to the development of the situation, Walsham (2002) claims that you may not define the dependent or/and independent variables in the first place. According to Mathiassen (2002), the weakness of practice studies such as case studies, surveys and interviews is that it separates research from practice. In this research use of qualitative methods enabled us to reflect deeper on the experiences from the project and to systematize the insights that were gained during the process.

The project was organized within the U-arctic Thematic Network “Local and Regional development”.<sup>5</sup> The aim was to build capacity for sustainable business and community development in remote regions of the Sakha Republic (Yakutia) through integration of theory and praxis-based knowledge and competencies. The development of the work processes was literally “on the ground”. Use of mobile technology and PCs was a central tool in this innovation process, sharing and exchanging information. The different project participants/partners were met in their daily life and in their own context. The project developed as a cooperation between the different actors. The different partner’s needs and interests were discussed and became a guide for the choice of theoretical approach. Such a way of working became useful for the villagers and the administration. They were free to their use their own strengths in their search for new and positive strategies for the future. This is in line with Heidegger’s analysis that we strive to establish a balanced, symmetrical way of cooperating and sharing each other’s universe/life world.

The empirical material emerges from qualitative data sources such as individual interviews, observations and document reviews (see table 1). Combined with the analysis of relevant literature, the workshops guided the remaining data collection processes. A total of 230 interviews were conducted, lasting between 30 minutes and one hour each. All interviews were based on an interview template developed based on the themes identified in the planning of the project. The project team did the organization of workshops. The project group had access to the project information and data from servers through Internet, which were located in Norway, Canada and Russia.

	Type of activities					
	2009	2010	2011	2012	2013	2014

<sup>5</sup>A partnership between Finnmark University College (FiUC), Alta, Norway and the Institute of Finance and Economics at the North-Eastern Federal University of Yakutsk, Russian Federation.

Observation (during participation in meetings and user courses)	Meetings with village administrators and key-persons 8. Village workshops 5 Business school activities 2, 36 participants Autumn conference, Gargia 38 participants	Meeting with village administrators and key-persons, 12 Village workshops 2 Business school activities 1, 22 participants Autumn conference, Gargia: 40 participants	Meeting with village administrators and key-persons: 4 Village workshops 2 Business school activities 2, 16/14 participants Autumn conference, Gargia: 44 participants	Meeting with village administrators and key-persons: 16 Village workshops: 5 Business school activities: 2, 16/16 participants Autumn conference, Gargia: 40 participants	Meeting with village administrators and key-persons: 10 Village workshops: 3 Business school activities: 2, 14/16 Autumn conference, Gargia/Tana 65 participants	Meeting with village administrators and key-persons: 12 Village workshops: 3 Business school activities 1, 20 Spring conference, Gargia/Oktemts y 80 participants
Interview	Interviews with 42 participants and stakeholders	Interviews with 28 participants stakeholders	Interviews with 46 participants and stakeholders	Interviews with 38 participants and stakeholders	Interviews with 36 participants and stakeholders	Interviews with 38 participants and stakeholders
Document analysis	project documents	meeting notes, emails and reports		user-training notes, workshop documentation		

Table 1. Data collection methods used

The project workshop and seminar series was called *Strategies for future development*<sup>6</sup>, which followed UiT's Business School<sup>7</sup> activities to stimulate local entrepreneurship in Arctic through new knowledge in economy and business administration. The aim was to highlight that the business entrepreneur does not exist in a vacuum; their success is dependent on financial matters as well as access to ICT, support from the local administration and institutions. However, support and acceptance from family, neighbours and fellow citizens is equally important. A goal for the workshop was to create an atmosphere of social and economic entrepreneurship, but also for the village administrators to see the importance of successful small businesses for the future community development. All information from the workshop was stored via PCs on the server. During the workshop the participants used mobile phone or PCs to share and exchange information. By taking an active part, administrators from the villages develop a growing awareness of the necessity of developing healthy communities to secure a sustainable development in the region. Use of mobile technology in this process became important for building new networks, making friendships and knowledge exchange between the actors in the project. Every workshop, seminars/courses or other project activities were evaluated continuously during the work processes. In the 2014 evaluation report the director of the Institute of Finance and Economics Yakutsk, commented:

*“a series of psychological seminars and training sessions that became one of the decisive factors in the realization of the project’s goals [...] topics were youth adaptation, solutions for family problems, the removal of social tension and the growth of trust, openness and the establishment of friendly contacts...”*

Recognizing the motivational power that lies in the connectedness among the villagers to their place, cultural practices and social interactions had an immediate positive effect on the participants in the project seminars and business school courses. In the project period from 2009, our aim was to test if this positive effect of including the psychological dimensions had a lasting positive effect on the innovative processes based on the use of technology. Two psychologists joined the team of scientists. Special sessions of family-therapy/family work exercises, narrative techniques and sharing of important psychological knowledge, empowerment and creativity was included in the activities. In these seminars, we act as process guides and demonstrate through our teaching the principles underlying the techniques and methods in communication, relation building and family work. The participants explore techniques for communication in exercises using role-play. Like working with families, we have an empowerment perspective in this work. The participants play an active part in finding good coping strategies. We also taught how to analyse and sort out problems and to be aware of the salutogenetic and resilience perspectives. From a community work perspective, we introduced “family–work seminars” to build family therapy competence among local health personnel, social workers, teachers, police and voluntary community workers.

All the participants had their own mobile phone (updated to smartphones during the project period) and PCs. Access to ICT was crucial to exchange, share and provide information from the project seminars and business school courses. Actors who participated were business school students, social workers, teachers, health workers and key persons in the municipal administration. Gender aspects, like women’s role in business development became relevant early in the project period. Women were in majority among the participants, and family

---

<sup>6</sup>The seminars was based on a model developed by Sissel Fredriksen and Tor Gjertsen, Finnmark University College.

<sup>7</sup>[https://uit.no/om/enhet/forsiden?p\\_dimension\\_id=88167](https://uit.no/om/enhet/forsiden?p_dimension_id=88167)



matters became a theme in many discussions. One specific happening in 2010 illustrates how the project strived to be sensitive to culture and place attachment and flexible to meet the emotional and social needs of our partners in the villages. A devastating flooding, because of ice barriers that had been building up in the enormous Lena River suddenly broke and reached the shore-settlements in minutes. Many homes were damaged and cattle died but luckily, there were no severe casualties among the villagers. Together with the village mayors and their administrations the planned seminars were restructured to meet the new situation and became helpful in other ways than had been planned on beforehand. Another similar situation when the village seminar content was restructured to meet the immediate needs of the villagers. In 2014, participants from the project group visited a north Siberian settlement to arrange workshop on strategies for future development. The village was in great grief. The week before, a young man together with an older man, a father of three children, had disappeared on the river returning from a visit in a neighbouring settlement. Except for the empty boat there as no track of the two men. The participants in the workshop showed a seriousness and concern, not only for the families affected by the accident, but also for the future of the settlement. They were open about the challenges and threats from the severe alcohol abuse, a problem that earlier had been denied. Together with the villagers we helped them to turn the grief into motivation to continue to fight against the private profit oriented sale of alcohol and to support the democratic and transparent village administrative initiated by the new female mayor village administration.

Openness, democratic attitudes and support from the village administrations was a critical factor for the projects to end successfully. In one region, we had very little success. It was crucial to exchange, share and provide information with use of ICT. There was a long history of distrust between the villagers and the administration, allegations of corruption, social problems and severe drug abuse. No seminar is alike and develops its own special dynamics. It is our responsibility as process guides to respect the participants and their contributions and see too, that the participants act the same way to each other's contributions. This is in accordance with the practices of constructive communication.

## **4 Analysis and discussion**

### ***4.1 Innovation processes and building social capital: psychological and technical***

The aim for all the activities conducted during the five year project period was, through empowerment, to build capacity for sustainable business and community development in the 12 villages taking part in the project (some villages had more than one village seminar). From the interviews and observations of working processes, we can conclude that most of the project goals were reached even if the degree of economic success varied. The creation of social partnership between the villagers was successful and both groups gave credit to the heightened awareness of psychological and cultural factors in the communication between the different partners in the working processes. Using psychological knowledge and giving room for dialogue in collaboration, we managed to establish a balanced, symmetrical relationship between scientists and villagers/village administration and between the villagers. A relationship they had rarely experienced, they had expected to meet with an asymmetrical relationship with "experts" telling the villagers what was the "right ways" for future development. Their new psychological insights led to a sense of personal power regarding one's choices in life as well as the development of a sense of collective efficacy, what community psychologists refer to as empowerment ([Perkins et al.](#), 2002). This is in line with Andersen (2013) stating that innovation only take place in extended and close cooperation

between people, both within businesses and other institutions, and between institutions. Such cooperation is likely to require mutual trust and understanding (Andersen, 2013). From the social capital perspective, mutual trust (bonding) eased the joint efforts from villagers and scientists to identify what may help or not, in mobilizing the formal and informal social assets in the different communities.

According to Putnam (2001) social capital is bonding (or exclusive) and/or bridging (or inclusive). Bonding social capital in this study denotes ties between participants in similar situations in the villages, such as immediate family, close friends and neighbours. Bridging social capital, encompasses more distant ties of “like persons” as loose friendships and social situations of work. Woolcock (2001) claims that linking social capital, which reaches out to unlike people in dissimilar situations, such as those who are entirely outside of the community, enable members to leverage a far wider range of resources than are available in the community (p. 13-14). ICT has a role to play in building social capital in the bridging function, however that role will depend on how individuals, communities, organizations and governments incorporate ICT into their lives and social structures. Aarsæther (2004) claims that cooperating closely with municipality and regional administration and existing businesses in the area are key factors for a successful outcome regarding a sustainable community. We highlight that ICT is a key in this work. Tuomi (2002) describes innovation as a network activity in which the traditional conception of organizations was emphasized to a lesser extent. By focusing on the “combinational” and the “organic” model of innovation, in which various competences and developments interrelate, innovation becomes construable as what it is, namely as a social process.

Access to the internet is of great importance for the entrepreneurs in small remote villages. In this respect we will include computer literacy as a valuable asset in social capital. To have effective home pages with the possibility to reach and develop a market for their products and sales through payment facilities can secure a sustainable economy. We have many successful examples from the projects. There were several entrepreneurs specializing in rare niche-products that required unique skills in making and often expensive, materials where the market and people willing to pay a good price were far away in the big cities like Moscow or St. Petersburg. Through Facebook and the Russian versions of social media, they also arranged distribution of the products among social networks. Especially for exclusive and highly priced cultural artefacts and traditionally prepared food.

According to Andersen (2013), choice of technology is an important part of many projects, but strategies, processes, people and culture are also important aspects. Users are often familiar with social media, and they expect to find similar utilities in other settings, not least in the workplace. It is important to develop innovation strategies that address user’s needs, possibilities and necessary utilities. Von Hippel (2001) claims that “As toolkits are more generally adopted the organization of innovation-related tasks seen today, especially in the field of custom integrated circuit development, will spread and users will increasingly be able to get exactly the products and services they want – by designing them for themselves (p. 256). The challenge is the broadband and mobile infrastructure in the Sakha republic. It is unevenly distributed, some of the areas we worked in were well (or became good during the project years) covered by both broadband and telephone networks, while other areas are almost without any coverage at all, with difficult satellite solutions. In the close cooperation with municipality and regional administration, institutions and both existing businesses and new entrepreneurs in innovation processes regarding future community development technology and internet access plays an important role.

#### ***4.2 Different psychological perspectives in the innovation process.***

Our research question was whether psychological knowledge can contribute to the innovation processes with use of technology. Humanistic psychology has since 2009 served as a guideline for building relationships in all communicational activities. The holistic, multi-dimensional perspective made us aware of the interaction between individuals and communicational technology regarding the psychosocial wellbeing among the villagers and their relations regionally, nationally and globally. Spare time was used on social media, online games and television. We found that there is a need to finding ways to implement online public services more accessible to participants in villages. The costs for online publishing and make essential public service information available online in languages of major ethnic minorities, is low. This does not only give practical access barriers, but also introduce a psychological benefit in the form of strengthening the feeling of not being overlooked and of having a stake in the administrative community system.

Our analysis shows that psychological wellbeing and empowerment of the village families and their children is equally important in both economic and social development regarding sustainability. When we were confronted with mental health and family problems meeting both administrative staff and the villagers they appreciated the way we could offer both help and education in family-therapy techniques.. In addition to being great personal tragedies for the victims of violence, drug- and sexual abuse and suicide, the social relations and the level of trust within the community was threatened. In the villages mentioned earlier, struck by the disasters and tragedies, cognitive and social psychology together with the psychotherapeutic knowledge we shared with the involved people had positive effect and strengthened the ties in the innovation processes.

Analysing the interviews after the seminars show that the participants become more able to interact with their environments by using technology. In line with Rutter (2008), we also found that these processes could be individual coping strategies, or could be a strategy for families, schools, communities and social policies that make resilience more likely to occur. This is in line with Satir (1967, 1972), who claims that there is hope for a better future for even the most troubled families.

All the participants comprised a varied group based on their different cultural and social traditions in terms of whether our origins were Norwegian, Russian, or belonging to the many Sakha indigenous tribes. The various interests and preferences of these users had to be handled appropriately through the innovation process. In our business development projects we had to deal with challenges related to environmental psychology and identity of place. The development work in several communities we visited had to deal with environmental challenges. Mining and exploitation of oil resources in the arctic region will have a profound impact on primary industries as well as the psychosocial wellbeing of the local population. In the indigenous regions, the primary industries like reindeer husbandry, fishing and hunting are not only important economically, but also regarding ethnic identity and spiritual life. The analysis of the observation in the study, highlight that cultural knowledge was important for understanding forces active in the innovation processes for a positive outcome of the business projects. Knowledge of the local community, organization and unique local culture(s) and practices became important in the cooperation with the participants.

As participating observers, we had to be aware of our own role, and be able to utilize the respondents. This is in line with Wadel (1991) and implies that you have to have knowledge of your own culture as well as the informants' culture, in order to interpret data coherently. Some of the challenges we found were related to the ability to interpret and understand the social structure of the community. We were able to formulate better questions to our working partners and received answers that were more informative. Communication can make

invisible aspects of culture more visible, such as norms, beliefs and values. In the continuous evaluations of the innovations work processes, and from the interviews we learned that misunderstandings and conflicts were few and both scientists and participants mentioned that the working processes had been exceptionally constructive compared with earlier working processes.

## 5 Conclusion

The study shows that understanding psychological aspects can help community developers to identify what may help or not, in mobilizing a particular community's formal and informal social assets. In such innovation process, use of technology can be a rational driving force for meeting the challenges faced by organizations in the change processes. Use of technology in cooperation with municipality and regional administration and existing businesses can be a key strengthening democracy and social capital, and were use of methodological triangulation can contribute to richer and more detailed knowledge of these phenomena.

## References

- Andersen, S. T. (2013). *User-centered innovation in psychiatric healthcare by using mobile technology* (PhD thesis). University of Oslo.
- Tödtling, F. (1994). The uneven landscape of innovation poles: Local embeddedness and global networks. *Globalization, Institutions, and Regional Development in Europe*, 68–90.
- Organization, W. H. (2004). *International statistical classification of diseases and related health problems*. Geneva: World Health Organization.
- Valsiner, J. (2001). Process structure of semiotic mediation in human development. *Human Development*, 44(2), 84–97.
- Valsiner, J. (2005). Scaffolding within the structure of dialogical self: Hierarchical dynamics of semiotic mediation. *New Ideas in Psychology*, 23(3), 197–206. <http://doi.org/10.1016/j.newideapsych.2006.06.001>
- Von Hippel, E. (1986). Lead users: A source of novel product concepts. *Management Science*, 32(7), 791–805. <http://doi.org/10.1287/mnsc.32.7.791>
- Aarsæther, N. (2004). Innovations in the nordic periphery. *Nordregio Report*, 3.
- Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). New York: Greenwood.
- Bærenholdt, J. O., & Aarsæther, N. (2002). Coping strategies, social capital and space. *European Urban and Regional Studies*, 9(2), 151–165. <http://doi.org/10.1177/096977640200900204>
- Ronnby, A. (1995). *Mobilizing local communities*. Aldershot: Avebury.
- Ronnby, A. (2009). Empowering people by community building. In G. S. Hutchinson, *Community work in the nordic countries: New trends*. Oslo: Universitetsforlaget.
- Sørensen, E., & Torfing, J. (2006). *Theories of democratic network governance*. Palgrave Macmillan UK.
- Virkkala, S. (2007). Innovation and networking in peripheral areas—a case study of emergence and change in rural manufacturing. *European Planning Studies*, 15(4), 511–529. <http://doi.org/10.1080/09654310601133948>
- Åslund, C., Starrin, B., & Nilsson, K. W. (2010). Social capital in relation to depression, musculoskeletal pain, and psychosomatic symptoms: A cross-sectional study of a large population-based cohort of swedish adolescents. *BMC Public Health*, 10, 715. <http://doi.org/10.1186/1471-2458-10-715>
- Ledogar, R. J., & Fleming, J. (2008). Social capital and resilience: A review of concepts and selected literature relevant to aboriginal youth resilience research. *Pimatisiwin*, 6(2), 25–46.
- Bolin, K., Lindgren, B., Lindström, M., & Nystedt, P. (2003). Investments in social capital—implications of social interactions for the production of health. *Social Science & Medicine* (1982), 56(12), 2379–2390.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard University Press.
- Perkins, D. D., & Long, D. A. (2002). Neighborhood sense of community and social capital. In A. T. Fisher, C. C. Sonn, & B. J. Bishop (Eds.), *Psychological sense of community* (pp. 291–318). Springer US.
- Perkins, D. D., Hughey, J., & Speer, P. W. (2002). Community psychology perspectives on social capital theory and community development practice. *Journal of the Community Development Society*, 33(1), 33–52. <http://doi.org/10.1080/15575330209490141>
- Mignone, J., & O'Neil, J. (2005). Social capital as a health determinant in first nations: An exploratory study in

- three communities. *International Journal of Indigenous Health*, 2(1), 26–33.
- Shweder, R. A. (1991). *Thinking through cultures: Expeditions in cultural psychology*. Cambridge: Harvard University Press.
- Hanssen, E. S. S. (2006). *Ett barnevern til samiske barns beste — riktig hjelp til riktig tid?* (Unpublished Master's thesis). Norwegian University of Science; Technology.
- Antonovsky, A. (1979). *Health, stress, and coping*. San Francisco: Jossey-Bass.
- Rutter, M. (2008). Developing concepts in developmental psychopathology. In J. J. Hudziak (Ed.),
- Hippel, E. von. (1988). *The sources of innovation*. Oxford University Press.
- Hippel, E. von. (2005). *Democratizing innovation*. Cambridge: MIT Press.
- Hippel, E. von, & Tyre, M. J. (1995). How learning by doing is done: Problem identification in novel process equipment. *Research Policy*, 24(1), 1–12. [http://doi.org/10.1016/0048-7333\(93\)00747-H](http://doi.org/10.1016/0048-7333(93)00747-H)
- Developmental psychopathology and wellnes* (pp. 3–22). Arlington: American Psychiatric Publishing.
- Tuomi, I. (2002). *Networks of innovation*. Oxford University Press.
- Christensen, C. M., & Bower, J. L. (1996). Customer power, strategic investment, and the failure of leading firms. *Strategic Management Journal*, 17(3), 197–218.
- Swanson, E. B., & Ramiller, N. C. (2004). Innovating mindfully with information technology. *MIS Quarterly*, 553–583.
- Swanson, E. B. (1994). Information systems innovation among organizations. *Management Science*, 40(9), 1069–1092. <http://doi.org/10.1287/mnsc.40.9.1069>
- Lyytinen, K., & Rose, G. M. (2003). Disruptive information system innovation: The case of internet computing. *Information Systems Journal*, 13(4), 301–330. <http://doi.org/10.1046/j.1365-2575.2003.00155.x>
- Repstad, P. (1998). *Mellom nærhet og distanse: kvalitative metoder i samfunnsfag*. Oslo: Universitetsforlaget.
- Thagaard, T. (2004). *Systematikk og innlevelse: En innføring i kvalitativ metode* (2nd ed.). Bergen: Fagbokforl.
- Walsham, G. (2002). *Interpretive case studies in IS research: Nature and method*. Sage.
- Mathiassen, L. (2002). Collaborative practice research. *Information Technology & People*, 15(4), 321–345. <http://doi.org/10.1108/09593840210453115>
- Putnam, R. D. (2001). *Bowling alone: The collapse and revival of american community*. New York: Simon; Schuster.
- Woolcock, M. (2001). The place of social capital in understanding social and economic outcomes. *Canadian Journal of Policy Research*, 2(1), 11–17.
- Hippel, E. von. (2001). User toolkits for innovation. *Journal of Product Innovation Management*, 18(4), 247–257. <http://doi.org/10.1111/1540-5885.1840247>
- Satir, V. (1967). *Conjoint family therapy*. Palo Alto, CA: Science; Behavior Books, Inc.
- Satir, V. (1972). *Peoplemaking*. Palo Alto, CA: Science; Behavior Books, Inc.