

Co-Creation of Innovation: Investment with and in Social Capital

Studies on collaboration between
education - industry - government



Corry G.J.M. Ehlen

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Co-Creation of Innovation: Investment with and in Social Capital

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Deze dissertatie draag ik op aan professionals in co-creatie,
uit wetenschap, beroepsonderwijs en bedrijfsleven

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General Introduction

1 Background

In our knowledge society human resources have become a factor of utmost importance. Traditional production factors, like natural resources, labor and financial capital have lost significance in the value creation process, and knowledge has become the decisive factor in adding value to production processes, products and services (Kessels, 2001a; Tissen, Andriessen & Lekanne Deprez, 1998). In today's global economy, organizations need to respond to the technological and social changes in order to stay ahead of the competition.

In this process of constant innovation, multidisciplinary and even inter-organizational approaches are necessary, as single organizations often do not have the resources and employees to face the challenging and complex innovations at hand. This shift results in a growing importance of networks and professional connections as knowledge creators, and a changing role of management (Stam, 2007; Weggeman, 1997).

Not only does this change apply to businesses, many universities are facing similar challenges in industry-university-partnerships or (inter)national/regional alliances. Such alliances are often stimulated by national or regional governments or take place within the framework of international policy programmes, such as the European Commission's 'Europe 2020 strategy for smart, sustainable and inclusive growth'.

General goals of university-business networks are mostly twofold, creating solutions for practical production or societal problems, and designing adequate educational programmes for the future workforce (Flynn & Pillay, 2013). Professionals in the inter-organizational innovation networks need to collaborate with other professionals outside their familiar domain, with other values and jargon, and with different perspectives.

Unfortunately, innovations often seem to be unsuccessful, leading to frustration and failure, while sustainability appears to be problematic (Beer & Nohria, 2000; Tidd, Pavitt & Bessant, 2001). In contemporary dynamic and sometimes chaotic organizations, employees need to have more than average competences to innovate (Cozijnsen & Vrakking, 2013; Weick & Quinn, 2004). In order to increase the success rate of innovations, it seems vital for organizations to acquire expertise on how professionals in workplaces produce knowledge within innovation groups, what problems they face and how they can improve their ability to realize successful innovations.

What motivated the research in the dissertation is the objective to create clarity about factors that influence innovation, and about the required competences of professionals in innovation processes, as well as to generate new ideas about support of the participating professionals.

Even though these kinds of organizational innovations receive substantial attention from researchers, still little is known about the interpersonal processes that provide incentives for innovation, and about factors that stimulate the innovators (Wopereis, I., Kirschner, P., Paas, F., Stoyanov, S., & Hendriks, M., 2005). Also, the role of human resource development (HRD) in sustaining these processes (Kessels & Poell, 2004) remains unclear.

Previous research on educational innovation has shown that a diversity of factors play a role (Maandag, D. W., Deinum, J. F., Hofman, A. W., & Buitink, J., 2007). Influential factors were related to social connections, trust, appreciation, shared ideas, and expertise (Wopereis, et al., 2005). These elements refer to the concept of 'Social Capital', rediscovered in the 1990s, which became a key concept in explaining innovation in different contexts and countries (Field, 2005; Kessels and Poell, 2004; Kostova & Roth, 2003; Tsai, 2001). Yet, it did not gain substantial attention in relation to educational innovation.

More systematic empirical research needs to be performed, as Kessels and Keursten signalled already in 2002, and was also advocated more recently by other researchers (Billett, 2008; Poell, 2012; Schilling & Kluge, 2009).

2 Aim of the Dissertation

This dissertation addresses the relation between *large-scale innovation processes* and *Social Capital* in partnerships of the educational sector with the industrial sectors. The research is geared towards three objectives: to provide new and deeper insights in the concept of Social Capital; to explore the possible contribution of the concept of Social Capital in understanding the dynamics of large-scale innovations, and to design an instrument for practitioners in order to improve these innovations.

3 Relevance of the Project

The research project aims at a new scientific understanding of the often complex and non-transparent processes of large-scale, inter-organizational innovation, and in the learning effects for the innovating professionals. In addition, the practical relevance of the study for innovators, human resource development and management is substantial. A better insight in such innovations and in its value for professionalizing of knowledge workers creates added value for society on a regional, national and international level, where collaboration and co-creation takes place.

4 Overview of the Dissertation

Chapter 1 Table 1. Design of the four studies

	Study 1	Study 2	Study 3	Study 4
Method	Literature review Model building	Case-study, mixed methods, explorative, model building	Case-study, mixed methods, explorative, model building	Qualitative and quantitative, designing, validating
Subject	Social Capital and (educational) innovation	Social Capital dimensions in a three-year lasting inter-organizational multi-level innovation project	Action dimension, knowledge productivity in an inter-organizational multi-level innovation project	Co-creation
Participants		Members of 9 mixed composed innovation teams, team leaders, program managers, board	Members of 6 mixed composed innovation teams, team leaders, program managers	Experts (scholars and practitioners)
<i>Numbers</i>		40	20	14
Instruments	Databases	Participative observation, document-analysis, telephonic interviews, interventions and reflection, semi-structured interviews, questionnaire	Semi-structured face-to-face interviews, document-analysis, attending of 2 meetings	Semi-structured interviews, questionnaire
Analysis	Text-analysis	Qualitative semi-structured coding; Grounding; Triangulation between methods	Qualitative semi-structured coding; Grounding; Triangulation with outcomes of study 2	Qualitative semi-structured coding

4.1 Chapter 2 Social Capital

This research project started with exploring the literature on Social Capital in relation to educational innovation. We examined literature on Social Capital theory with a focus on the main empirical studies since the first publication in 1916 by Hanifan (1916). Since hardly any research on large-scale educational innovation has been conducted from a Social Capital theory perspective, we considered studies in adjacent domains, such as non-profit organizations in non-educational sectors and knowledge-intensive organizations in the private and public domain.

We present an overview of the evolution of Social Capital theory over the past century, including its origins, applications and meanings in various periods. Nahapiet and Goshal's model (1998) is described in detail because it is still widely acknowledged by scholars in different scientific disciplines. This model illustrates how the process of creating new collective knowledge and knowing capacity occurs by the influence of three dimensions and collective actions of Social Capital. We designed a comprised model of the creation of new collective knowledge by Social Capital. (See Figure 2, Chapter 2).

In order to estimate the value of the Social Capital theory for our purpose, we compared the main features of Social Capital theory with features of four prevailing innovation theories and models in the educational domain that share the emphasis on the professional as essential factor in innovation. These theories and models include 'Diffusion of Innovation Theory', 'Concerns Based Adoption Model', 'Cultural Historical Activity Theory', and 'Social Network Theory'. Concluding, we discuss merits and pitfalls of Social Capital theory and its value for the understanding of complex innovations.

4.2 Chapter 3 Inter-organizational large-scale Innovation; the first case-study

Chapter 3 reports on the case-study of the Limburg Leisure Academy (LLA), a large-scale 'Industry - School' project of eight professional schools of different levels and eight businesses in the leisure industry, located in the south-eastern region of The Netherlands. It is a structured project, with a steering committee, a sounding board, project managers, seventeen innovation groups, and a research group, subsidized by the national government. Similar projects were also launched outside The Netherlands, as a new way to improve the quality of professional education (Flynn & Pillay, 2013).

The main elements of the research framework of Social Capital and innovation are displayed in Figure 1. (Chapter 3, also shown below).

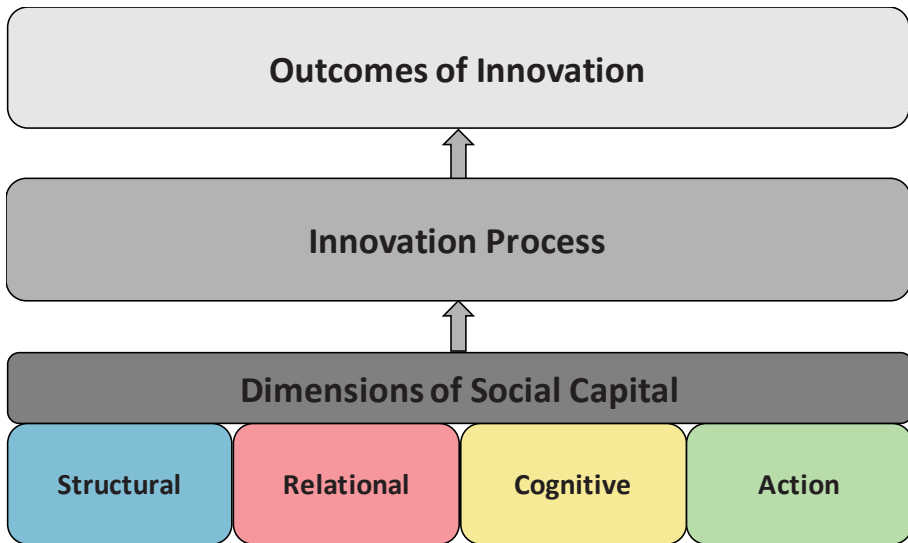


Figure 1. Research model: dimensions of Social Capital and innovation (see chapter 3)

Guided by this framework, three research questions were formulated:

- 1 Which Social Capital dimensions stimulate the innovation process?
- 2 What is the output of the innovation process for participating organizations and professionals?
- 3 How can the innovating professionals be supported from a Social Capital perspective?

We applied mostly qualitative, partially pre-designed methods, to ensure the in-depth investigation of the project (Yin, 2003). In particular document analysis, participative observation, telephone interviews, interventions and reflections, face-to-face interviews, and a questionnaire at the end of the project were used. Data collection and data analysis consisted of ongoing, alternating processes, during the whole project period. The research framework, with the four dimensions of Social Capital, proved to be helpful to uncover detailed characteristics of the phases of the innovation process, hidden process factors and outcomes, and specified the organizational and individual outcomes of the project. With the abundance of data the three research questions could be answered adequately.

4.3 Chapter 4 Knowledge productivity and innovation; the second case-study

Although the LLA-case-study delivered many data and findings, we wanted to replicate this research in another setting. The aim was also to further specify the action dimension, in particular the knowledge production activities of the teams, being the

foundation for the creation of products, processes and services. For this reason our research framework (see Figure 1, Chapter 3) was broadened with the concept of knowledge productivity, adapted from Kessels (1995, 2001b).

Knowledge productivity refers to the competence of individuals and groups to gradually improve and radically innovate in operating procedures, products and services. This process entails tracing relevant information, using this information to develop new abilities, and applying these abilities for improvement and innovation (Kessels, 2004). Chapter 4 reports on this second case-study, which explored processes of knowledge productivity for sustainable innovation and associated Human Resource Development implications.

The research model of this study regards the relations between Social Capital, knowledge productivity and organizational innovation. (See Figure 1, Chapter 4). This case-study concerned another large-scale three-year inter-organizational open innovation programme, the project Zorg Academie Parkstad (ZAP) (Care Academy ParkStad). It entails a collaborative initiative, involving four organizations within the healthcare domain, two governmental organizations, and the vocational education, higher education and university sectors.

Combining methodological preferences of the first case-study with the opportunities within this project, semi-structured face-to-face interviews were used to gain further insights into knowledge productivity and Social Capital of the innovators. The following four research questions were central:

- 1 Which knowledge-productive activities lead to improvement or innovation for the organization?
- 2 Which knowledge-productive activities lead to new capabilities among the professionals?
- 3 Which dimensions of Social Capital stimulate these knowledge-productive processes?
- 4 Which external conditions stimulate Social Capital and knowledge-productivity?

This case-study provided specific data about the process and outcomes of knowledge productive activities, offered a confirmation of findings from the innovation process of the LLA case-study and confirmed the usefulness of the conceptual framework.

4.4 Chapter 5 Validation of the Co-Creation-Wheel

The translation of the findings of the first three studies into an instrument for innovators was the goal of the last study. For that reason, we re-oriented on our theoret-

ical framework and broadened this with the concept of co-creation, because this term expresses the core of collaborative innovation.

Combining the findings of the studies on Social Capital dimensions and innovation, knowledge productivity and co-creation, we designed a model of success factors for co-creation in teams. This 'Co-Creation-Wheel' is a model that presents dimensions and factors of co-creation, and demonstrates the comprehensiveness of co-creation (see Figure 1, Chapter 5).

Chapter 5 reports on this model and on the validation by experts, in view of the following four research questions:

- 1 Which mechanisms and dimensions of the 'Co-Creation-Wheel' do experts discern as important?
- 2 Which interdependency between the mechanisms and dimensions can be discerned?
- 3 Which actors and activities are important in co-creation processes?
- 4 What is the value of the 'Co-Creation-Wheel' for practice and future research?

Fourteen experts and practitioners in areas of educational innovation, organizational change, collaborative learning, and industrial co-creation, validated the model of the Co-Creation-Wheel. Two instruments were used, a questionnaire and a semi-structured interview. The findings resulted in a slight revision of the Co-Creation-Wheel, which both categories of experts found a very relevant instrument for practice and a valuable contribution to theory.

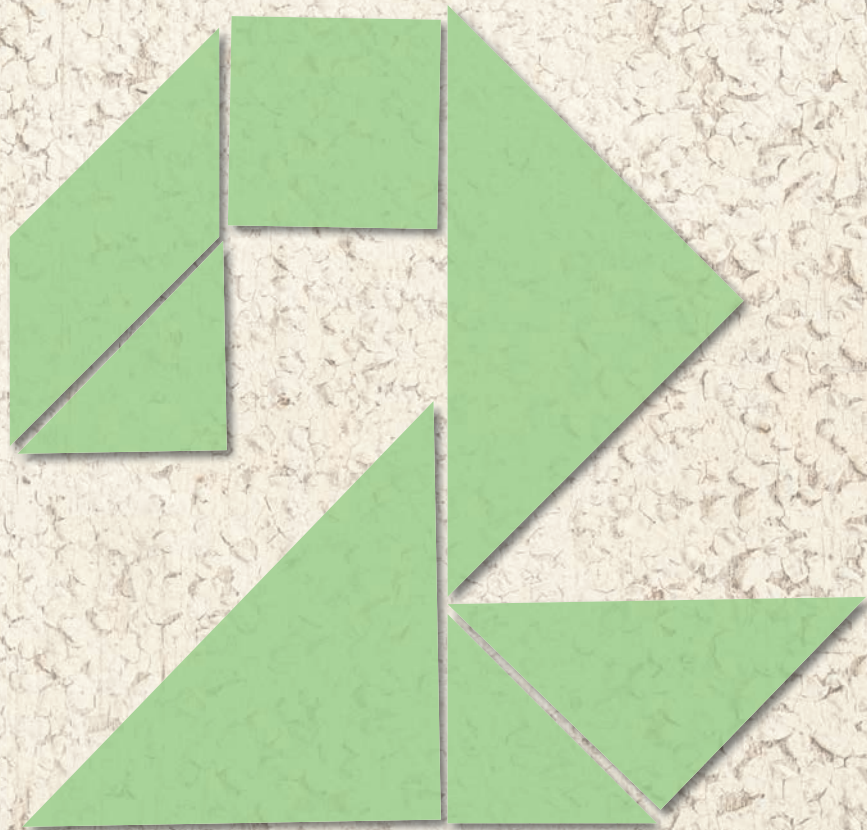
4.5 Chapter 6 Conclusions and Discussion

Chapter 6 contains a discussion on the findings and conclusions and the implications for theory and innovation practice. Finally the summary and "samenvatting" are presented.

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One Hundred Years of 'Social Capital': Historical Development and Contribution to Collective Knowledge Creation in Organizational Innovation

This chapter is based on:
Ehlen, C.G., Van der Klink, M., Boshuizen, H.P.A. (2014).
One Hundred Years of 'Social Capital':
Historical Development and Contribution to
Collective Knowledge Creation in Organizational Innovation.
Submitted for publication.

Abstract

Understanding complex processes of organizational innovation and personal learning, and ways to support sustainable innovation, is becoming more and more important. The concept of Social Capital proves to be a key concept in declaring innovation in many domains. Main question of this research is: does the concept of Social Capital provide valuable insights for professionals to improve innovation in their workplace and to enhance personal capabilities? This literature review on Social Capital theory, focuses on the domain of professional education, but also has a broader scope. The paper examines the potential of the concept for increasing understanding of complex innovations. After description of the concept of Social Capital in creating new knowledge, and a historical retrospect, we compare the theory with four prevailing theories of innovation. The Social Capital perspective appears to better reveal intangible processes as the dynamics that drives sustainable innovation, and offers an interesting framework for guiding innovation.

1 Introduction

The past decades have been characterized by large-scale innovations aimed at preparing organizations for the era of the knowledge economy. These innovations were common across Europe and beyond, and demanded changes at various organizational levels. Not seldom these were unsuccessful and caused tension and frustration of employees. In the sector of professional education in The Netherlands, universities designed long-term multilevel and organization-wide programmes that aimed to implement a paradigm shift in the minds and actions of the entire staff. University boards, management and consultants diligently sought strategies to handle these enormous changes. Despite the quite huge resistance with which the universities were confronted, some of them succeeded in creating a climate in which professionals felt committed to achieving common goals. It seemed, as Fullan states (2006) that successful large-scale innovation requires a collective process of knowledge creation, in which colleagues, by sharing explicit knowledge and revealing tacit knowledge, collaborate.

Over the past 20 years, substantial attention has been devoted to Social Capital theory, since it appears to contribute significantly to our understanding of the factors that determine the success of complex innovations in different sectors and countries (Field, 2005; Kostova & Roth, 2003; Leana & Van Buren, 1999; Tsai, 2001). However, the concept of Social Capital seems to be an under-researched topic in the educational sector (Kirschner, Hendriks, Paas, Wopereis, & Cordewener, 2004). This article examines the potential of this theory for increasing our understanding of complex large-scale innovations. For this purpose we examined literature on Social Capital theory with the focus on the main empirical studies since the first publication in 1916 (Hanifan, 1916). The search showed that there has hardly been any research on large-scale educational innovation from a Social Capital theory perspective. We therefore also considered studies in adjacent domains, such as non-profit organizations in non-educational sectors and knowledge-intensive organizations in the private and public domains.

We start this article with an overview of the evolution of the concept over the past century, including its origins, applications and meanings in various periods. We then present, in detail, a model from Nahapiet and Goshal (1998) that is widely acknowledged by scholars in different scientific disciplines. This model illustrates how the process of creating new collective knowledge and knowing capacity occurs. Next, we compare the main features of the Social Capital theory with features of four prevailing innovation theories that share the emphasis on the professional as essential

factor in innovation. We conclude by discussing merits and pitfalls of the Social Capital theory and its value for understanding of complex innovations.

2 The Evolving Concept of Social Capital: a Three-Stage Process

Over the last 100 years, scholars have developed Social Capital as a multifaceted concept, emphasizing constituting elements for different purposes in a variety of fields. This section discusses the development of Social Capital theory during three distinct periods. Table 1 gives a condensed summary.

Table 1. Overview of the evolution of Social Capital theory

	Social	Capital	Social and Capital
Period	1915–1990	1990–2000	2000–2015
Educational domain	Domain of origin; Attention to social relations and educational improvement	Attention disappeared; emphasis on achievements of students in different social layers	Growing attention; emphasis on student achievements and institutional innovation
Theme	What is Social Capital?	What is the impact of Social Capital?	How does ‘social’ create ‘capital’?
Important domains	Education, minorities	Community, society, politics, economics, public health, education	Community, society, politics, economics, public health, organizational development, education
Definition	Quality of the relations as resource for common action and goods	Variety of definitions, fragmentary aspects	From definition to refined models, tested theory, growing evidence
Scholars	Hanifan, Bourdieu, Coleman	Putnam, Portes, Lin, Woolcock, Burt, Granovetter	Putnam, Portes, Lin, Nahapiet and Ghoshal, Paldam, Adler
Research	Metaphorical and prescriptive	Quantitative evidence, mostly on economic innovation and societal improvements	Qualitative, mixed, multidisciplinary
Dissemination	Some articles	A myriad of articles in journals in many domains	Mainstream books and handbooks

Social Capital theory has its origins in the educational domain. Hanifan, Bourdieu and Coleman are regarded as the pioneers who utilized Social Capital theory for improving education. Hanifan, a reformer of rural schools in West Virginia, proposed the concept for the first time in the context of educating minority populations,

stressing the importance of community involvement. His account of Social Capital emphasized the value of social relations in a community 'as capital' for their members. Social Capital refers

'... not to real estate, or to personal property or to cold cash, but rather to that in life which tends to make this tangible substances count for most in the daily lives of people, namely, goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals who make up a social unit...' (Hanifan, 1916).

Hanifan's introduction of the concept, however, did not attract noticeable attention. Scientific recognition came six decades later when the French scholar Bourdieu used the concept to demonstrate the inequality of the Social Capital of groups in society. At the same time, the American scholar Coleman promoted Social Capital as a means of socialization, 'creating human capital'. Bourdieu's sociological definition of Social Capital includes

'... the aggregate of actual or potential resources linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition...' 'This group membership provides members with the backing of the collectively owned capital' (Bourdieu, 1986).

He emphasized the 'resources' of the membership of a network as a collective possession, which defines one's social position and possibilities, as well as the availability of 'institutional resources', such as education.

Contrary to Bourdieu, Coleman (1990) welcomed the reproduction of upper-class values and norms by means of forming the right Social Capital. Family and school have to contribute significantly to this process of reproduction. Coleman proposed three forms of Social Capital: level of trust (as evidenced by obligations and expectations), information channels, and norms and sanctions that promote the common good over self-interest. This Social Capital facilitates certain actions (Coleman, 1990). His definition emphasizes, like Hanifan's, the value of social relations and the quality of these relations, as well as the channels, promoting the common good.

Despite their differences, Hanifan, Bourdieu and Coleman share the emphasis on the usability of the concept as an explanation for educational achievement. However, they did not further develop the concept into an empirically sound theory.

Between 1990 and 2000, the concept of Social Capital became recognized across different fields. Especially Coleman's interpretation was frequently adopted mostly by scholars in political sciences and economics in attempts to 'capitalize' social relations. Key questions included the economic pay-off of Social Capital (Knack & Keefer, 1997), and how to measure Social Capital (Paldam, 2000; Stone, 2001). Scholars pointed at Social Capital as a powerful factor at macro, meso and micro levels (Isham, Kelly & Ramaswamy, 2002) that positively influences the development in settings as developing countries, communities, health, education, democracy and government, and economic development (Jackman & Miller, 1996; Portes & Sensenbrenner, 1993). In the USA, Social Capital theory continued to attract attention in education circles since it was used to investigate the achievements of pupils and students (Dika & Singh, 2002). The rise of Social Capital theory was encouraged by publications in well-established journals, such as the *Academy of Management Journal* and *Harvard Educational Review*, which contributed to its scientific status.

The enhancement of the status of Social Capital theory was accompanied by in-depth elaboration on its various components, such as networks, trust, norms, values and collaboration. This pursuit of making the concept of Social Capital better measurable was also criticized as it encouraged researchers to focus on separate variables, ignoring the concept of Social Capital as a whole. As Lin (1999, p.33) stated, 'the concept of Social Capital has been de-contextualized and divorced from its roots in individual interactions and networking'. Most research studies in this stage are quantitative and non-contextual (Cooke & Wills, 1999; Gabbay & Zuckerman, 1998 ; Tsai & Ghoshal, 1998). The concept became accepted in fields as economics and political sciences, but as a consequence the 'capital' aspect was placed in the foreground and the 'social' gradually faded into the background.

The fact that Social Capital research focused more on particular fragments, raised concerns. The need for an overarching theory outlining the essence of Social Capital was signalled by Nahapiet and Ghoshal (1998), who proposed a three-dimensional model that became widely adopted by many scholars in different fields. During the last decades, multidisciplinary research has grown, theoretically refined models have emerged and increasing attention has been paid to the contextual embedding of Social Capital. The use of qualitative research and mixed methods has become common.

The growing body of research encouraged the production of reviews, books and handbooks, such as the often cited review by Portes (2000). Dika and Singh (2002) reviewed the state of the art in the educational domain, while Robert Putnam's book 'Bowling Alone' (2000) attracted a broad readership. A year later, the first

'Social Capital' handbook was published, 'Social Capital, a theory of social structure and action' (Lin, 2001), presenting empirical research and providing a research agenda on the instrumental aspects of Social Capital. More handbooks are those by Castiglione, van Deth and Wolleb (2008), and Svendsen and Svendsen (2009), 'The Troika of Sociology, Political Science and Economics'. It seems as if through these handbooks partly the work of the early pioneers mirror. Lin's work is influenced by Bourdieu and presents Social Capital as phenomenon of networks and action. Castiglione, van Deth and Wolleb focus on the effects of Social Capital, whereas Svendsen and Svendsen emphasize the need for interdisciplinarity. None of the handbooks pays any attention to Social Capital in the educational domain.

3 Social Capital and the Creation of Collective Knowledge

The contemporary discourse on Social Capital builds still on Nahapiet and Ghoshal's (1998) three-dimensional model, which is presented in Figure 1. Their article has been cited more than 9430 times (2014) and has become a top article in business strategy discussions. The authors provide a description, based on empirical and conceptual studies, of how Social Capital contributes to organizational innovation by creating intellectual capital, and describe a series of hypothesized relationships between dimensions of Social Capital and processes necessary for the creation of intellectual capital.

Nahapiet and Ghoshal distinguish three components in the process of creating collective knowledge, namely Social Capital (component I), the combination and exchange of intellectual capital (component II), and the creation of new collective knowledge (component III). They specified the relations in and between these three components in the model presented in Figure 1.

The first component – Social Capital (Figure 1, component I) – consists of three dimensions, namely the structural, the relational and the cognitive, which influence processes of combination and exchange of intellectual capital. The *structural* dimension addresses properties of the social system, containing the impersonal linkages between people or units and refers to the connections between actors, such as a social network, providing individuals with the accessibility to information or resources. Key facets are network ties, configuration, such as hierarchy, and appropriable organization. The *relational* dimension, 'refers to those assets created and leveraged through relationships' (Nahapiet & Ghoshal, 1998, p.244), for example respect and friendship. Actions differ considerably according to one's personal and emotional attachments to other network members. Key facets are trust and trust-

worthiness, norms and sanctions, obligations and expectations, and identity and identification. The *cognitive* dimension reveals resources in the context of knowledge sharing and knowledge creation. 'It refers to those resources providing shared representations, interpretations and systems of meaning among parties including shared language and codes and shared narratives'. This cognitive dimension is important for the creation of new intellectual capital (ibidem, 1998, p.244).

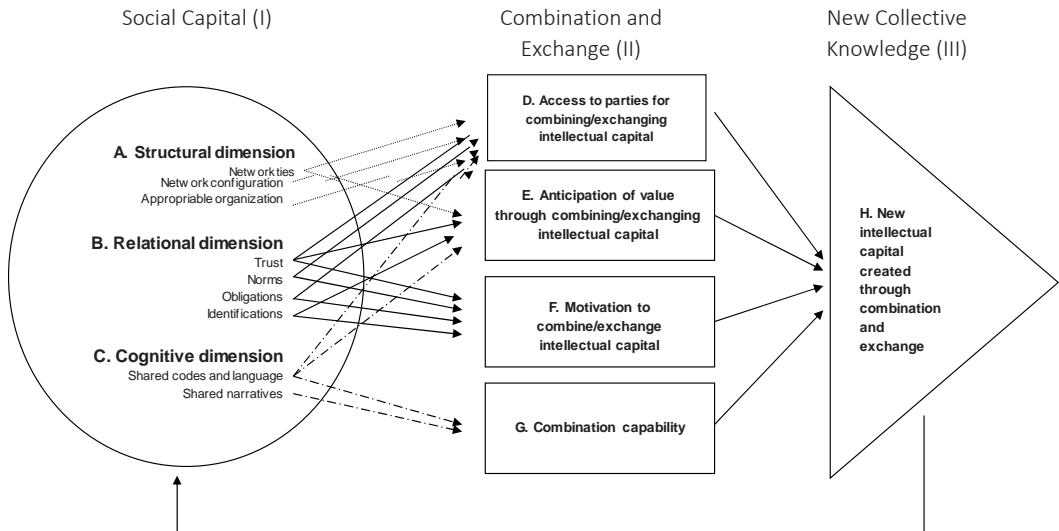


Figure 1. The three-dimensional model of Social Capital and creation of collective knowledge (Nahapiet and Ghoshal, 1998)

Nahapiet and Ghoshal further distinguish collective actions (Figure 1, component II), which are crucial in the process of creating intellectual capital. They describe these collective actions as the 'combination and exchange of intellectual capital'. This stage consists of four conditions for the creation of new capital, namely access to parties who possess knowledge (D), anticipation of value to be created (E), motivation to engage in knowing activity (F) and 'combination capability' (G), being the ability to recognize, assimilate and use new knowledge. Together, these four conditions form the heart of the framework and lead to new intellectual capital. Nahapiet and Ghoshal present the complex relationships between the three dimensions of Social Capital and the four conditions (see the arrows in Figure 1) as hypotheses that require further investigation.

The third component of their model – the new intellectual capital (Figure 1, component III) – refers to a specific type of knowledge, 'the knowledge and knowing capability of a social collectivity'. Nahapiet and Ghoshal do not refer the creation of individual knowledge, but to the creation of collective knowledge.

We made a comprised model, pictured in Figure 2. It shows the spiral process of the creation of new intellectual capital facilitated by Social Capital: the new intellectual capital in turn influences the Social Capital, which in turn facilitates the process of the exchange and combination of knowledge, leading to new intellectual capital, and so on. The creation of intellectual capital through Social Capital should therefore be seen as a complex, dialectic process of 'co-evolution' (Nahapiet & Ghoshal, 1998, p.250), or a process of co-creation, as we would say.

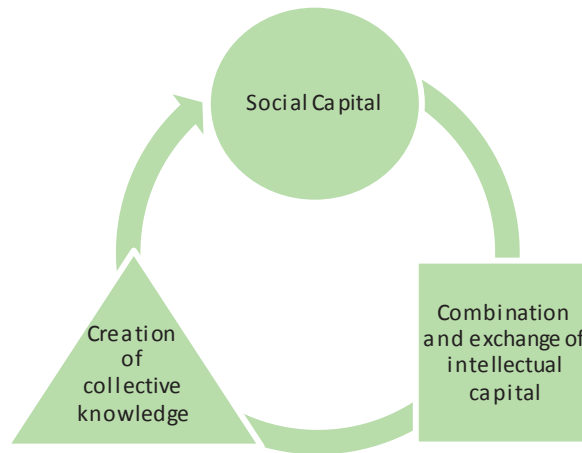


Figure 2. The spiral process of the creation of new collective knowledge (Ehlen, Van der Klink & Boshuizen, 2009)

Nahapiet and Ghoshal are well aware of the limitations of their model and recommend further development through research. Only a few empirical studies have investigated the entire model (Kaasa, 2009), namely those conducted by Tsai and Ghoshal (1998), Hatzakis, Lycett, Macredie and Martin (2005) and De Jong (2010). Parts of the model were confirmed by investigations reported by, for example, Adler and Kwon (2002), Kostova and Roth (2003), Leana and Van Buren (1999), Falk and Kilpatrick (2000) and Hanson (2008). Although studies have shown the impact of the three dimensions on innovation, a consistent use of terminology concerning the investigated facets, conditions and dimensions still seems to be lacking. What is called structural in one study, is called cognitive or relational in another. Studies mainly focus on the structural dimension, while the relational and cognitive dimensions have hardly been investigated, as De Jong states (2010). Research on the multi-dimensionality and coherence of aspects is still scarce. Supportive for further development of the model is research that allows close collaboration between researchers and practitioners (Adler & Kwon, 2002; Moolenaar, 2010; Weber & Weber, 2007).

4 Social Capital, the Creation of Knowledge and Knowing Capacity, and Innovation

In order to determine the added value of Social Capital theory for innovation, we will compare it with four prevailing theories in educational domain. The selected theories have in common that they go beyond the structural–functionalistic views on innovation. All of them acknowledge that professionals are essential subjects in the innovation process. The four theories are the organizational development theory, the concerns-based adoption model, the cultural–historical activity theory and the social network theory. Table 2 presents an overview of their main characteristics.

4.1 Organizational Development Theory

The well-known ‘Diffusion of innovation’ model (Rogers, 1995) belongs to the Organizational Development (OD) theory, going back to Kurt Lewin (Marrow, 1977) and Argyris (1957). It is a planned, organization-wide effort to increase an organization’s viability. Rogers’s well worked out model explains the variables that influence how and why users adopt new information, and is oriented towards the individual behavior of members in change processes. The model is often cited in relation to innovation in higher education (Adams, 2002).

It provides, according to Rogers (1995), a vocabulary to understand adoption and resistance to change. Innovation is ‘an idea, practice, or object that is perceived to be new by an individual or other unit of adoption’ (ibidem, p.11), and diffusion is ‘the process by which an innovation is communicated through certain channels of a social system over a period of time’ (ibidem, p.35). ‘Communication is a process in which participants create and share information with one another to reach a mutual understanding’ and the social system consists of ‘the interrelated units engaged in joint problem solving to accomplish a common goal’ (ibidem, p.23).

Rogers’s research focused on five elements: (1) the characteristics of an innovation that may influence its adoption; (2) the decision-making process that occurs when individuals consider adopting a new idea, product or practice; (3) the characteristics of individuals that make them likely to adopt an innovation; (4) the consequences of adopting an innovation; and (5) the communication channels in the adoption process.

Table 2. Prevailing theories of innovation

Name	Organizational development Diffusion of innovation model	Concerns-based adoption model (CBAM)	Cultural–historical activity theory (CHAT)	Social network theory	Social Capital theory
Scholars	Argyris, Senge, Weick, Rogers,	Andersen, Hall & Hord, van den Berg & Vandenberghe	Vygotsky, Engeström	Burt, Granovetter, Lin, Wenger	Bourdieu, Coleman Nahapiet & Ghoshal
Purpose	Organizational innovation	Guidance of the implementation of educational innovation	Qualitative change of an organizational system	Advantage for individual or network	Value for individual or community
Focus	Individual in a learning organization	Inclusive, subjective; cultural–individual perspective	Organization as a historical–cultural socio-system of individual actions	Connecting and sharing	Relations and collaboration
Vision / Core	Organization as learning organism and sum of individual actions; sense making is a powerful element	Understanding attitudes and ideas of professionals is key factor for guidance of change	An activity system is a historical–cultural combination of individual and systemic components	Individuals are connected in network relations offering each other information and support	Quality of social relations are essential for collaboration and creation of value
Idea of innovation	Innovation is the key for organizational advantage and is a staged process	Staged process of learning, based on subjective experience and personal ideas; the actor concerned is the most important factor in the change process	Contradictions lead to expansive learning (= innovative)	Innovation can arise in networks	Social relations create the conditions and quality of innovation
Instrument	Stages of innovation; standard deviation curve of adopters; characteristics of an innovation	Instrument to measure change processes; 12 basic assumptions; The stages of concerns questionnaire	Model of an activity system: object–subject–tools community of practice-division of labor rules	Network analysis instrument; model of bonding, bridging, linking; strong and weak ties	Multifaceted three-dimensional model of creation of collective knowledge
Change agency	Guiding the individual towards organizational goals	Styles and interventions of agent = creative, contextual, interactive, understanding	Role = stimulating the community of acting subjects	Makes it possible to connect	Facilitating the social network to cooperate and to create new value
Empirical evidence	Significant evidence in organizations	Proved in education domain	Some evidence in education domain	Some evidence in education domain	Little evidence in education domain

Rogers claims that the success of innovation diffusion depends on three factors. First, the opinion of the innovation adopter regarding the following five key characteristics of an innovation: relative advantage, compatibility, complexity, trial ability and observation ability. Second, the 'individual innovativeness' of potential adopters, expressed in the standard deviation curve of adopters: innovators, early adopters, early majority, late majority and laggards. Third, interpersonal networks, because these are channels of information. On the basis of these three main factors, the innovation decision process includes six stages: knowledge, persuasion, decision, implementation, confirmation and discontinuance.

Rogers's model is a theory for explaining organizational innovations. It focuses on the 'adopting' role of the individuals. Compared to Social Capital theory, Rogers's model contains elements of Social Capital, such as networks, shared perceptions, channels of information, collaboration and ownership. However, the model does not elaborate the relation between these elements, as Social Capital theory does. Moreover, Rogers considers innovation a top-down process, using a system-oriented view that places the members in the 'object-position' obliged to adopt the innovation designed by 'the' organization.

4.2 Concerns-Based Adoption Model

The concerns-based adoption model (CBAM) of Anderson (1997), described in Van den Berg & Ros (1999), is a conceptual framework that describes, explains and predicts teachers concerns and behaviours throughout an innovation process. It was developed as a tool for empowerment of professionals in innovation processes, and is known for its inclusive perspective and its attention to the individual in the organization.

In this model, guiding a process of change presupposes the understanding of attitudes and ideas of the professionals who are involved in the change process. The CBAM assumes that a change agent is needed who understands the opinions of the 'clients' about the change, their learning needs in specific stadia of change, and takes this as a focus for guidance. Because all learners and contexts differ, this requires a creative and interactive process. The model explains the process of educational change and how change agents can influence this. For this purpose the model offers instruments to measure change processes both within each component and in combination with each other, such as the Stages of Concern Questionnaire (SoCQ).

This model is quite elaborate and proposes three core concepts. With regard to the first concept – ‘Stages of Concern’ – the CBAM sees change as a process of learning, consisting of seven stages structured around the involved professional (Do I want this?), the task (Am I able to do this?) and others (What does this mean for colleagues and students?). The second concept – ‘Levels of Use’ – shows whether the learner is able and motivated to implement the change. ‘Innovation Configurations’, which is the third concept, shows different ways of implementing an innovation, ranging from ideal to less desirable. Van den Berg, Vandenberghe, & Sleegers (1999) further refined the CBAM and reported empirical evidence for a link between the stages of concern and the effects of the innovation process.

The CBAM adds to Rogers’s innovation diffusion model an emphasis on items as feelings, competence, opinions and motivation of the ‘client’ (which are also concepts of the relational and cognitive dimensions of Social Capital theory), and the understanding and responsiveness of the change agent. A major difference with the Social Capital perspective is that the CBAM is mainly oriented towards the individual professional, and does not pay specific attention to the relations between professionals. A second difference is that the CBAM has well worked out instruments for change agents in educational projects.

4.3 Cultural-Historical Activity Theory

The cultural-historical activity theory (CHAT) presented by Engeström et al. (1987) has received substantial attention (Cole & Engeström, 1993; Meyers, 2007), also in the educational domain (see for an overview Miedema & Stam, 2010). The theory connects professional learning and practice, individual learning and collective learning with the innovation of the organization. The goal of CHAT is to understand the mental capabilities of an individual. Activity theory is primarily a social theory of consciousness and wants to define consciousness – all the mental functioning including remembering, deciding, classifying, generalizing, etcetera, – as a product of social interactions with other people and of the use of tools (Kaptelinin, Kuutti & Bannon, 1995). It rejects isolated individuals as an insufficient unit of analysis, in analyzing the cultural and technical aspects of human actions. One principle of activity theory is that many activities have multiple motivation (‘poly motivation’). Engeström (1987) suggests that the organizational learning process includes the preliminary stages of goal and problem formation. Rather than seeing learning as transmission, the formation of learning goals is the key to the learning activity.

This theory describes actions in socio-systems through six related elements of a conceptual system: an activity is seen as a system of human ‘doing’, whereby a sub-

ject (1) works on an object (2) in order to obtain a desired outcome product. In order to do this, the subject employs tools (3), which may be external (e.g. an axe, a computer) or internal (e.g. a plan). Tools are influenced by culture, and their use is a way to accumulate and transmit social knowledge. 'The tool is at the same time both enabling and limiting: it empowers the subject in the transformation process with the historically collected experience and skill 'crystallized' to it, but it also restricts the interaction to be from the perspective of that particular tool or instrument; other potential features of an object remain invisible to the subject' (Kuutti, 1996).

Other elements include the division of labor (4) – the hierarchical structure and division of activities among actors– and rules (5), guidelines regulating activities in the system; subjects are grouped into communities of practice (6), with rules between subject and community and division of labor between object and community. Creativity plays an important role in activity theory, in the sense that human beings are seen as creatively acting in the system.

Both Social Capital theory and activity theory perceive the individual as the subject that, with others, is acting in a context. Activity theory tries to explain what mental, cognitive, structural and relational processes are going on between organization members who are acting to achieve goals, in a quite similar way to Social Capital theory. Activity theory describes very specific components of this dynamic creation process from a mainly goal-oriented perspective, while Social Capital theory describes similar components from a process perspective. In addition, Social Capital theory emphasizes the quality of social connections as a prerequisite for creating intellectual capital. Whereas Social Capital theory explores the social relations processes, CHAT focuses on the intra-psychical processes of individuals. In this respect, Social Capital theory is probably able to shed light on aspects that remain hidden in CHAT, and vice versa.

4.4 Social Network Approach

The social network approach, used since the 1980s in organizational theories (Burt, 1992; Granovetter, 1992) has now become popular in the educational domain. Many communities of practice, and communities of learning, cross-organizational, inter-organizational networks, have taken off within the educational field. These refer to the social network theory that assumes advantage by connecting ties with potential (Moolenaar, 2010). A social network is a social structure made up of individuals or organizations (nodes) that are connected (tied) by one or more specific types of interdependency, such as friendship, kinship, common interest, financial exchange or relationships of beliefs, knowledge or prestige. In its most simple form,

a social network is a map of all relevant ties between the nodes. The power of social network theory seems to be the view that individuals' attributes are less important than their relationships with other actors within the network. Granovetter (1973) describes, for instance, how 'weak ties' (members who are not strongly connected to the primary network and are going to shop abroad) gain 'strength' by bringing information to the network from outside that can be eye-opening to the other network members.

Research has shown that social networks play a critical role in determining the ways in which organizations are run, and the degree to which individuals succeed in achieving their goals (Adler & Kwon, 2002; Kilpatrick, Field, & Falk, 2003). Recent multi-case research, including cases in the educational domain, shows that 'linking' ties (connections outside the organization) are more innovative than 'bridging' ties (connections between teams) or 'bonding' ties (connections in a network) (De Jong, 2010). Social network theory and Social Capital theory are closely related. Social network theory refers in fact to the structural dimension of Social Capital theory. Social Capital theory adds to social network theory the relational and the cognitive dimension and explores the dynamics and interrelatedness of these elements.

5 Conclusion and Discussion

This article addressed the issue of the added value of the concept of Social Capital to innovation. The previous sections discussed the origins and evolution of this concept, presented its core and compared it with prevailing theories on innovation. This section reflects on the main question and discusses implications for further study of innovation processes from the perspective of Social Capital and for the use of the concept as guidance in the practice of sustainable change.

To summarize, the concept of Social Capital appears to have its origin in the field of educational innovation, almost 100 years ago. The renewed attention in social sciences, many decades later, proved its attractiveness for innovation purposes in different domains. Especially the three-dimensional model of Social Capital by Nahapiet and Ghoshal (1998) presents clearly how the dynamics of Social Capital facilitate the exchange of knowledge and result in creation of new collective knowledge. In this way, Social Capital theory presents a holistic view on innovation processes, addressing different elements as networks, relations and affections, trust, common goals and shared understanding, tacit and explicit knowledge, knowing capacity, and interaction for collective knowledge. Especially research conducted in the past decade

has led to more detailed insights into the dynamics and the multifaceted character of Social Capital and enhanced the use of this theory as a guideline for innovations.

Despite its origin and the increasing attention in very different domains, Social Capital theory remained fairly unknown in education field. In this domain, other theories and models prevail. Searching for the added value of Social Capital theory, this article has presented some leading theories that design and research innovations in education. All the theories discussed, emphasize important elements for understanding educational innovation. What they all have in common is that they are grounded in empirical research. But there are differences too. For instance, Rogers’s diffusion of innovation and the CBAM both elaborate on implementation of a top-down innovation, neither theory covers all phases of the innovation process as Social Capital theory does. Of the theories presented, the CBAM provides the most elaborate tools and instruments for guiding change, whereas the other discussed theories are much more generic. The main advantage of CHAT is its focus on creativity, but it does not consider the relational and affective elements. Social network theory emphasizes the importance of sharing information, but does not provide details about the process or does not show how this can be organized.

The main advantage of Social Capital theory for innovation seems to be its comprehensiveness, as it addresses many elements that play a role in innovations. It not only refers to investment in social networks or relationships, but also emphasizes the necessary cognitive quality of connections and collective actions to produce new knowledge and knowledge products. It focuses on the powerful creativity of the connections and their collaboration.

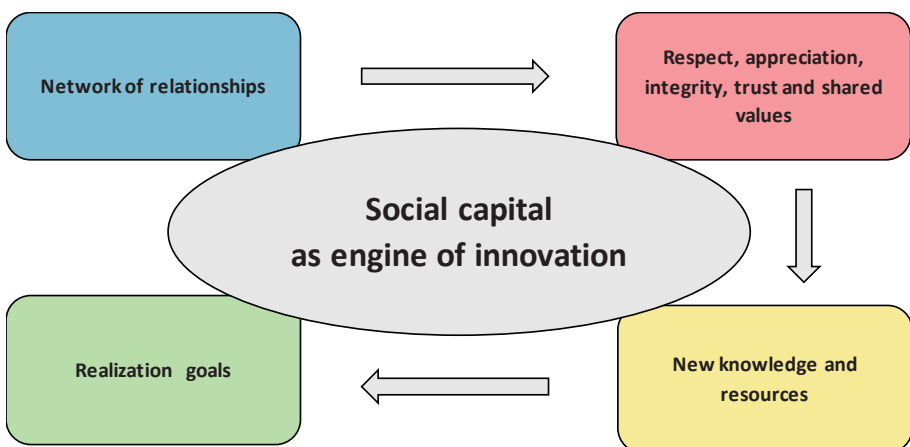


Figure 3. Social Capital

Social Capital theory offers a holistic framework for the dynamic and complex process of co-creation. By doing so, it emphasizes the role of the actors/professionals as co-creators in innovation, and clarifies the necessary conditions in structure, relations, cognition and actions for the co-creation of new value. Social Capital theory does not provide procedures or rules for innovation, but its dimensions could be used as guideline for innovators.

In the last decade, educational innovation has comprised large-scale projects between several layers within an organization or between educational field and industries. This is often a diffuse process and it is not clear what will be the final result of the innovation. In these types of complex innovations positive social relations are necessary to connect the creativity and collective knowledge of the professionals. Such positive work climate will encourage them to be knowledge productive (Kessels & Keursten, 2002) and ensure that the innovation is sustainable.

For this reasons, Social Capital theory seems to be most promising for explaining and designing these kinds of complex innovation processes. It specifies the value of the social processes for the creation of new collective knowledge, as Kessels and Poell describe (2004). The most important contribution of Social Capital theory is: it makes clear that innovation should be viewed and guided from the perspective of the collectivity of professionals, because they are the intellectual and Social Capital of the organization, the hidden power that has to be revealed. Altogether the insights so far allow the conclusion that the theory of Social Capital appears to fit much better to the complexity of innovations in which professionals are perceived as responsible innovators. In this way, innovating is a way of collective learning and acquiring of new knowledge and skills at the workplace.

It is worthwhile to conduct further research on innovation through the lens of Social Capital theory, to obtain more insights how professionals can handle complex innovations. The model of Nahapiet and Ghoshal offers a suitable framework for that purpose. Although it is promising as a theory, we are aware of possible limitations that need to be considered in further research. As researchers suggest (De Jong, 2010; Kilpatrick, et al., 2003; Moolenaar, 2010; Nahapiet & Ghoshal, 1998) more clarity about the theory and its use can be provided by longitudinal or participative research in the complexity of the innovation processes, to see the dynamics of the components of Social Capital 'at work' and to discover factors that stimulate or hinder learning and innovating. Special attention could be given on the emotional aspect of the relational dimension, as previous research on the Social Capital model recommended this aspect (Weber & Weber, 2007). It also would be interesting to focus on the collective actions, such as the decision-making process, because these

elements are not yet worked out in the theory of Nahapiet and Ghoshal. Earlier scholars describe components of what we would call the 'action dimension' (Hanifan, 1916; Coleman, 1990; Lin, 2001) but it is not yet connected to a coherent theory. A third important element to pay attention to in future research could be the 'building' of Social Capital. Then, as Woolcock (1998) stated, '... it is logical that we would want to improve it, and at least maintain it, so as not to lose its significant benefits.' In a society that needs creativity and innovation not only for economic purposes and educational goals, but also as a condition for life-long learning, the Social Capital perspective could become the power that drives sustainable innovation.

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Unravelling the Social Dynamics of an Industry-School Partnership: Social Capital as Perspective for Co-Creation

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Abstract

Increasingly, innovative collaboration between industry and schools is being exploited as a way of improving the quality and relevance of professional education. Even though these innovations appear to have substantial benefits, often the impact proves to fade away after their implementation. A better understanding of how to sustain complex innovations seems important. Unfortunately, only a limited amount of research investigates the 'inside' of complex innovations. This article reports on a three-year, large-scale industry-school programme in the Dutch Leisure sector. The research, from start to finish, adopted a qualitative case study methodology with a mixed-methods approach, drawing upon Social Capital theory as lens to understand the dynamics of processes and effect on outcomes. Findings indicate that the Social Capital theory helps to unravel crucial factors of processes and outcomes. The researched innovation process depended not so much on formal project plans and objectives but was largely built on the quality of social relationships at all levels. Sustaining this Social Capital proved crucial, while managing according to a planned change strategy appeared to be counterproductive. The outcomes show to be two-fold, in terms of new knowledge and products for the organizations, and of sustainable benefits for the professionals, in terms of new abilities.

1 Introduction

In the current era of knowledge and globalization, rapid economic changes and high societal demands bring new challenges for education, requiring unusual ways of innovation, and showing creativity and invention (Robertson 2007). Often, organizations have to start from scratch facing these challenges. Government and industry stakeholders, both internationally and nationally actively pursued collaborative arrangements with schools and universities to address post-industrial needs of the knowledge economy. For instance, the EU 2020 ERASMUS + programme, started in 2014, considerably invests in piloting of large scale 'knowledge alliances' to boost innovative collaborations across Europe. These arrangements between educational institutions and society are increasingly seen as a key source of generating valid knowledge strengthening the knowledge society.

A variety of terms is used to describe such arrangements such as: public-private partnerships, school-enterprise collaboration, or business-school relationships (Flynn, Pillay, and Watters 2013). The terms reflect the diversity of collaborative institutional arrangements between public and private sector actors, to achieve mutual goals, new opportunities to improve the quality of education (Robertson, Munday, and Verger 2012). In this article we use the term Industry-School-Partnership (ISP) for the arrangement between business organizations and lower, vocational-, and higher education.

There is evidence of benefits for industry and school (Billett et al. 2007; Hoeve and Smulders 2012; Longworth and Osborne 2010), but little is known about the ways to achieve these benefits. Innovation often is developing as a diffuse process in which only a general idea about the starting situation and the desired end state exists. It is a challenge for most schools requiring insight in innovation processes, paying high attention to the abilities of the innovating professionals and the ways to sustain them (Van der Klink 2012). Some evidence exists that successful partnerships are based on convergence and trust, shared goals, and positive relations between professionals (Billett et al. 2007; De Jong 2010; Moolenaar 2010).

Hardly any evidence exists showing how to create and share knowledge and showing the reasons why professionals are willing and able to learn and profit from this innovation experience. In order to research these issues, an ISP-case of a three-year collaboration programme was monitored, from the beginning to the end.

This article reports on the dynamics (Homan 2007) and outcomes of the collaboration processes, which this study has uncovered, and on their implications for guidance of the innovating professionals.

2 Conceptual framework

2.1 Innovation

The work of Nahapiet and Ghoshal (1998) and Kessels (2004) emphasizes that innovation is a matter of collaboration between professionals, which results in knowledge sharing and new knowledge creation. We define innovation as ‘the processes and actions of collaboration to co-create new products, processes or services’. These processes sometimes are partly planned, require creativity, out of the box thinking, and intensive collaboration between actors who are, sometimes, unknown to each other, at different organizational levels. There are many factors responsible for the process and the outcomes of innovations, such as relations, emotions and knowledge activities. How these factors influence each other is mostly unknown, since research findings are lacking.

Existing innovation theories do not entirely cover the kinds of complex innovations that emerge in an ISP. The diffusion-of-innovation theory (Rogers 1995), the CBAM (concerns-based-adoption-model) (Van den Berg, Vandenberghe, and Slegers 1999), the cultural–historical activity theory (CHAT) (Engestrøm 1987), the social network theory (Granovetter 1973), and the Social Capital theory (Nahapiet and Ghoshal 1998) all emphasize elements for understanding educational innovation, but there are differences too. For instance, both Rogers theory and CBAM elaborate on the implementation phase of an innovation that has been outlined top-down. CBAM provides the most elaborate guidelines, tools and instruments for guiding change processes, whereas the other theories are much more generic. The main advantage of CHAT is its focus on the system and the creative activity of the actors. Social network theory emphasizes the importance of sharing information by network members, but does not provide details about the process or how to organize this.

The Social Capital theory addresses many elements that play a role in innovations and this comprehensiveness is its main advantage. Especially the model of Nahapiet and Ghoshal, offers a holistic framework for understanding the complex process of co-creation. It emphasizes the role of the professionals as co-creators, and clarifies the necessary conditions in structure, relations, cognition and actions for the crea-

tion of new knowledge and products. This model has been used in research on innovations (Dhillon 2009; de Jong 2010) and this present study also applies it as basis for the conceptual framework.

2.2 Social Capital Theory

The Social Capital theory gained attention since it specifies the value of social processes for the creation of new knowledge and products (Kessels and Poell 2004; Lesser 2012). Within this theory, Social Capital is considered a powerful factor that positively influences innovations in various different kinds of contexts and settings (Field 2008; Isham, Kelly, and Ramaswamy 2002). This theory is well accepted in academic disciplines as economics and organizational change theory (Borgatti and Foster 2003; Woolcock 2000), but in Human Resource Development (HRD) and in educational sciences it was until recently fairly unknown (Moolenaar 2010). A compelling set of studies researched particular aspects of Social Capital theory, such as networks, trust, norms, values and collaboration (Field and Schuller 2000; Gabbay and Ezra 1998).

Nahapiet and Ghoshal's (1998) model of Social Capital in creating new knowledge, can be considered a breakthrough in the progress of Social Capital theory, since their overarching and balanced theory emphasizes the holistic character and the coherence of many elements. Their model consists of three components: 1) the dimensions of Social Capital, 2) collective actions and 3) the new knowledge as outcome. The first component consists of three dimensions that influence processes of combining and exchanging intellectual capital. The structural dimension addresses properties of the social system, comprising the impersonal configuration of linkages between people or units, and refers to the pattern of connections between actors, visualized as a social network providing individuals with access to information or resources. The relational dimension addresses aspects of personal relationships that people develop through a history of interactions, for example respect and friendship. It refers to those assets that are created and leveraged through relationships. The cognitive dimension refers to resources that represent facets of particular importance in the context of sharing and creating knowledge. According to Nahapiet and Ghoshal (1998) it is this cognitive dimension that is important for the creation of new intellectual capital. The second component in their model pertains to collective actions that are crucial in the process of creating intellectual capital. They describe these collective actions as the 'combination and exchange of intellectual capital' (1998, p.250). This combination and exchange stage depends on access to parties who possess knowledge, the anticipation of value to be created, the motivation to engage in knowing activity, and the combination capability, which refers to the abil-

ity to recognize, assimilate and use new knowledge. The third component of Nahapiet and Ghoshal's model refers to the outcomes of the process of creating intellectual capital: the newly created collective intellectual capital, explicit knowledge and tacit knowledge.

To build the conceptual framework of this study, we adopted the model of Nahapiet and Ghoshal, and formulated their component 'collective actions' as fourth dimension. Firstly because we wanted to explore the interdependence of these four elements, secondly because, in our view, the 'actions' are essential to change the 'structural, relational and cognitive assets' into capital. Social Capital exists, in this view, out of these four dimensions. Support for this view is found in works of Social Capital scholars like the pioneers Hanifan (1916) and Coleman (1986), and more recently of Lin (2001), Kostova and Roth (2003) and Putnam (2001).

With this framework, displayed in Figure 1, three research questions are investigated:

- 1 Which Social Capital dimensions stimulate the innovation process, and how do they develop?
- 2 What are the outcomes of the innovation process for the participating organizations and for the professionals?
- 3 How can the innovating professionals be supported from a Social Capital perspective?

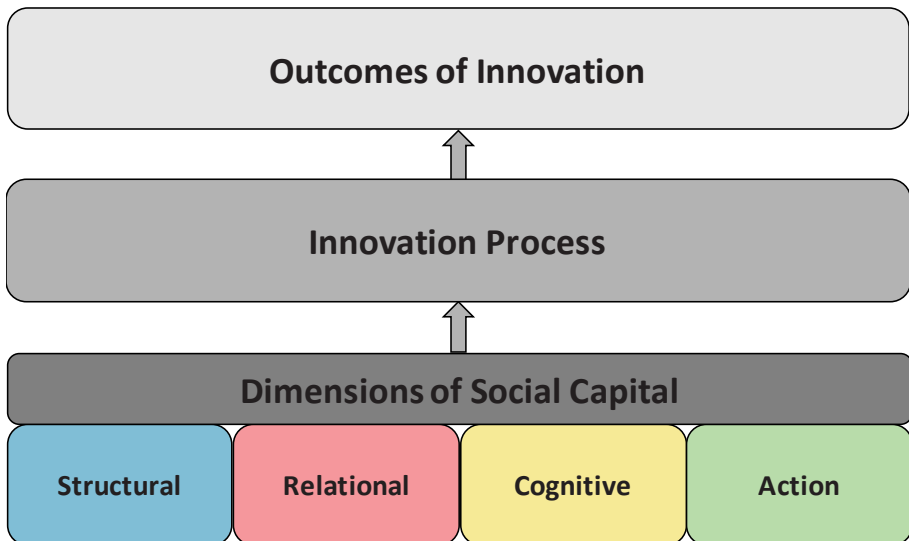


Figure 1. Research model: dimensions of Social Capital and innovation

3 Method

As these research questions refer to a contemporary phenomenon within a real-life context, where the researchers have little control over the processes, an exploratory case-study design has been chosen (Yin 2003).

3.1 Setting and participants

A three-year inter-organizational innovation project in the Dutch Leisure sector was selected as case to investigate in-depth the innovation processes as well as the outcomes, between schools and industry, from the perspective of Social Capital. This large-scale project was a collaborative initiative of eight vocational educational institutes which offer programmes at various levels, and eight companies in the leisure sector (see Figure 2). The aim was to link schools and companies more closely to better address the needs of the Leisure sector, and finally to establish a New Academy to address the various training needs of the leisure sector workforce. The management team and a steering committee, consisting of representatives of the participating schools and companies, had the lead. During the first year, three innovation teams were formed, each comprising 6–8 teachers, school coordinators and employees of the leisure companies, such as directors or managers. During the second and third year, 14 pilot project teams were active. None of the participants had any experience with large-scale complex innovations in which schools and companies collaborate.

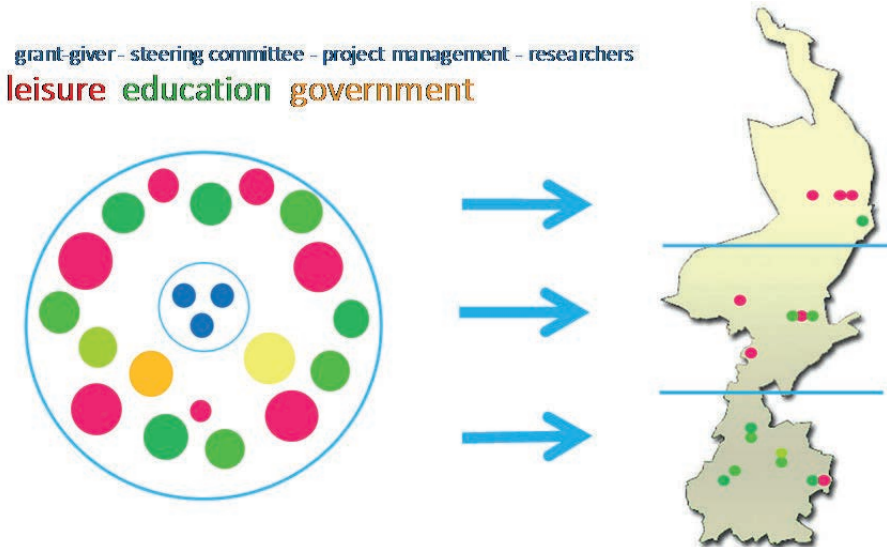


Figure 2. Project Limburg Leisure Academy

3.2 Data collection and quality

Two researchers collected and analyzed data from start to finish. They also had a role as consultant of the project management and facilitator of the innovation groups. An open and trustful atmosphere between project-management, participants and researchers, a condition for this long in-depth research, was realized.

According to Cavaye (2004), the triangulation of different kinds of data remains a key way to maintain the rigor and reliability of research into Social Capital. Therefore, several, mostly qualitative, instruments were used to collect data (see Table 1 for an overview). The use of the instruments was only partially pre-designed. The content and timing were informed by developments in the project and were discussed with the management team and the chairs of the innovation teams, whose acceptance was essential for partnership with the researchers. The data collection and data analysis were on-going, alternating processes, as action research with the participants. The variables of the research framework were further operationalized and specified to collect and analyze data. The quality of the data collection and analysis was enhanced by collaboration and joint reflection with project members, chairs, management. Table 1 shows the instruments, the periods, participants, materials and topics.

Documents (e.g. project plans, meeting reports, e-mail messages) were gathered throughout the project. Participative observations took place during 18 group meetings in the first project year, and during 8 management team meetings and 10 plenary meetings during the three years. The report of each meeting, as well as other observation notes, were checked by the second researcher or an involved participant, and specified if necessary. These notes were also included in the coding during the analysis of the qualitative data with ATLAS.ti.

In the second and third year of the project, semi-structured face-to-face interviews were conducted with sixteen members of the pilot project teams, with the two members of the project management team, and with four members of the steering committee. Table 1 provides an overview of the interview topics, that correspond to the components of the research framework: dimensions of Social Capital: structure, relations, cognition, action, innovation process, outcomes of innovation. The interviews lasted between 1.5 and 2 hours, and were conducted by two researchers. Each interview was audio recorded and the transcript was mailed to interviewees for validation.

Table 1. Instrument, period, participant, material and topic

Instrument	Period	Participant, Material	Topic					Outcomes
			Structure	Relation	Cognition	Action	Process	
document analysis	throughout the project	project plans, reports of group and plenary meetings, emails	inter-organizational composition, hierarchy, autonomy (A)	norms and values, expectations, emotions, atmosphere (B)	expertise, meanings, internal and external resources	networking, designing and learning, implementing, power, energy (D)	products	
participative observation	throughout the project, mainly first year	meetings and conversations with members of project teams and management team, final conference	see A	see B and personal relations	expertise, meanings, internal and external resources, innovation capability (C)	see D		
interviews by phone	first year	two members of the project teams (n=6)		see B	expertise, meanings, internal and external resources	actions, power, energy	products and results for organizations, individual capabilities of participants	
in-depth interviews	second and third years	members of the project teams (n=16) management team (n=2), members of the steering committee (n=2)	see A	see B	see C	networking, designing and learning, implementing, power, energy		
questionnaire	end of third year	project participants of all levels (n=30)		personal relations, expectations	expertise, meanings, internal and external resources			
general member check	final conference	all project participants and colleagues (n=50)	see A	personal relations, expectations	expertise, meanings, internal and external resources	networking, designing and learning, implementing, power, energy	products and benefits for organizations and individuals	

At the closing of the project all participants (N=30) filled out a final questionnaire, that was developed in collaboration with some group members, chairs and management team, to guarantee that no important topics were missing (see Appendix 1, chapter 3). Subjects were the perceived educational-organizational (scale 1,2,3) and individual (scale 4-7) project outcomes (see Table 3). The scales consisted of between four and seven items (5-point Likert items ranging from 1 = very low to 5 = very high), also open questions were added.

A final member check, as validation, took place at the final day-conference, where 50 participants, and colleagues of all levels and organizations were gathered. The conclusions, presented by the researcher, were reformulated as theses by the chair of the steering committee, and the participants could express, in an interactive way, their agreement and give additional comments. This resulted in confirmation of the presented outcomes by all conference attendees, steering committee included.

3.3 Data analysis

In order to ensure the quality of the analysis process, three researchers (CE, TdJ, and SyS) analyzed the qualitative data, being the documents (e.g. project plans, formal meeting reports, e-mail messages) as well as notes of the group meetings, of the management team meetings and the plenary meetings. To reduce the vast amount of data, a qualitative content analysis (Miles and Hubermann 1994) is conducted.

The qualitative data were analyzed with ATLAS.ti by means of a coding system that represented the six elements of the research model (see Figure 1). This detailed categorization system has been developed and refined throughout the research process (Glaser and Strauss 2008). The reports and notes were arranged according to the innovation groups and position of the interviewees, and analyzed according to the elements and to the phases of the project. During the analysis new codes emerged from the data, or existing codes were refined by adding sub-codes. The analyses per element and per phase were synthesized and then summarised in a report. SPSS 18.0 was used to analyse the quantitative questionnaire data. The internal consistency of the scales was calculated. The Cronbach's alpha coefficients varied between .73 and .92, which seems fairly acceptable. After completion of the analyses, an external researcher audited the researchers according to the procedure of Halpern (Akkerman et al. 2008). This resulted in a confirmation of the findings and a refinement of sub-elements.

4 Findings

The unravelling of the contribution of the four Social Capital dimensions and its development during the innovation process, has been the main reason to follow this project from start to finish, which is seldom possible to follow a project so intensively and long. Secondly we were interested in the innovative outcomes, and thirdly in supportive factors for the innovating professionals from a Social Capital perspective. This section first presents the findings concerning the Social Capital dimensions during the project (see Table 2), in the second part of this section the innovative outcomes are presented for organizations and professionals (see Table 3). The description of these findings presents also supportive factors for the innovators. The findings on this huge amount of three year data, will be reported on an aggregated level, yet illustrating the multifaceted character of Social Capital and the complexity of processes.

4.1 The role of Social Capital dimensions in the innovation process

Main finding is that the four dimensions are strongly interdependent and changed during the project. The second finding is that many factors influenced these holistic, organic phenomena. Thirdly we found that this complex large-scale process hardly can be 'known and influenced' by management, and that there were many steering actors.

To demonstrate these findings we will present a chronological biography of the three year, per phase, analyzed per dimension, and illustrated with quotes from participants. Reading each dimension separately, offers a rich picture of its contribution to the innovation process.

Table 2 summarizes the main characteristics of each dimension per project phase, as well as its innovative outcomes.

Table 2. Characteristics of the Social Capital dimensions and outcomes per phase

Phase	Year 0, 1 Preparation	Year 1 Orientation	Year 1, 2 Designing	Year 2,3 Production	Year 3 Dissemination
Innovation process	from passion to plan	courtship	co-creation	realities	looking for sustainability
Structural dimension	pioneers, network, hierarchy, funding	task, autonomy, procedures, power	shared interests, identification, ownership,	identity, interests	voluntary network, shared goals
Relational dimension	passion, relationships, commitment	values, pleasure	shared goals, understanding	appreciation, solidarity	sympathy, shared values, trust
Cognitive dimension	motivation, project- and innovation capability	knowledge, expertise, jargon	content expertise, innovation capability, communication skills	presentation skills, cooperation skills	expertise, motivation, perseverance
Action dimension	enticing, linking, planning	bonding, making acquaintance, cooperating	designing, linking and bridging, learning	deliberating, negotiating, implementing	presenting, networking, collaborating
Outcomes	consortium, project plan	trust, understanding	knowledge, products	organizational and personal benefits	sustainable and owned development

Preparation phase: ‘From Passion to Plan’

The starting point for the project has been the shared ambition of two teachers, to better align education and business and to realise tailor-made education:

‘We wanted to realise our ideals to make the education for the students more practice oriented’ (pioneers).

During this preparation phase, the **structure** of the project changed from informal bottom-up to formal top-down. After two-years of preparation, these pioneers formulated the urgency and the objectives, enlisted supporters, drew up a plan, appointed a project management team and obtained a project grant from a funding governmental organization. As the conditions for funding demanded a larger consortium of participating schools and companies, interested parties from outside their immediate networks were recruited. But, the large number, the diversity and

the regional dispersal of the participating organizations hindered the realisation of the project goals, as highlighted by one of the two pioneers:

'At the time the numbers of participants increased, the project lost its initial direction. You try to acknowledge all different kinds of contributions but that is not always conducive for the project. Because of this broad scope the project was approved, but for me it was a bit too broad' (pioneer).

The pioneers relinquished their central position in favour of a steering committee and a project management team that had succeeded in attracting funding. The 'passion' of the pioneers was replaced by the 'power of the plan'.

In the beginning of the project, the **relations** between participants were built on trust and common ideas of the two pioneers. They were able to enthuse their own schools and networks, and experienced support, appreciation, reciprocity and trust in their plan.

'The enthusiasm of x and y (pioneers), their experience and friendship, persuaded me to join this adventure' (teacher).

But later on, functional relations replaced personal relations, and the commitment of new members turned out to be more opportunistic than passionate.

'The initial enthusiasm and engagement became a project, and later on a reviewed project (..) and at a certain point in time you think, what's it all about?' (pioneer).

At **cognitive** level, the pioneers missed enough expertise and hired external experts to compose a project plan. The most important **actions** in this phase were, finding, convincing and enticing partners, planning and writing the project plan. Progress during this phase was achieved by networking and sharing resources: contacts, knowledge, finance.

This phase **resulted** in three tangible outcomes, namely a functioning consortium, an approved project plan and a proposal for a project structure. In short: during this phase the structural, relational and action dimension were strong, the cognitive dimension proved to be weak.

Orientation phase: 'Courtship'

Regarding the *structure*, the steering committee and project management were involved in defining their own roles and positions. The pioneers no longer had a special position, they were now 'just' chairs and members of innovation teams. Three innovation teams started to design the products that would be at the core of the New Academy. Teachers' autonomy appeared to be limited. They had to ask their managers for consent:

'I could not decide on my own but had to consult my coordinator, and that does not give energy' (teacher).

Meanwhile the members of the companies, all managers, held a formal mandate from their employer.

The mutual *relationships* in this phase were growing. The observations and telephonic interviews of the researchers, revealed that group members felt an urgent need to get to know their fellow group members but no time had been allocated for this 'courtship'. The project management acknowledged this need and the teams planned 'courtship activities'. The atmosphere improved, and group members were genuinely interested in each other and 'believed' in the project:

'The project brought things together. All partners were seated around the same table. We all shared the same goal' (pioneer).

Norms and procedures were established, the project management encouraged a sense of ownership and personal relations. 'Make it your own project' was their advice. On the other hand, within the steering committee the relations were formal, and there was a lack of mutual trust and understanding. Differences in interest became visible and the project management tried to create good relations between all parties.

This project phase mainly meant exploring the potential '*cognitive resources*' within the three innovation teams and to understand each other's professional jargon. The common knowledge grew step by step, through sharing members' experiences and ideas. This was a time-consuming process, that finally clarified the possible contribution of each group member:

'We had learned to understand each other's language, knowledge and experience. The strength of our group was the clarity about the contribution of

the individual members. Every member had his or her own role, and everyone saw the bigger picture of the entire group' (teacher).

Most members appeared to be unfamiliar with the process of co-creating educational products. The solutions they proposed very much depended on the knowledge and ideas at hand. There was also a lack of common language, not only between teachers and company representatives, but also among teachers. Another shortfall turned out to be the ability to structure meetings. The lack of these skills and knowledge led sometimes to considerable frustration, which had an impact on the progress of the project.

The main **actions** in this orientation phase appeared to be to establish positive relations, to create a shared language and shared goals between all actors, and a result-oriented team spirit. Trust, reciprocity, friendship and acquaintance resulted from the informality and pleasant atmosphere.

'We visited each other's workplaces, it was nice to see what they did and how the atmosphere was' (teacher).

The main **outcomes** of this phase involved the increase in trust, mutual understanding, common language and a rough idea of the work that lay ahead.

In short: during this phase the structural dimension showed weaknesses, the relational dimension was strong, the cognition has been explored and actions were growing.

Designing phase: 'Co-creation'

Observations and interviews demonstrated a difficult process in this phase of the project. In terms of the **structural** dimension, two aspects were relevant. Firstly, there was the issue of autonomy and dichotomy. Now the products for a New Academy became reality, some school directors were afraid to lose autonomy by a too close collaboration between participating schools.

'I gradually began to feel that each of the institutes was 'preaching to the converted', while the importance of the pupil and of the future employer, remained subordinate to the importance of school and/or government' (business member).

Secondly, the steering committee increased its control of the process of the project, and their opinions – rather than the ideas of the teachers – became the driving force. As a result, the project management had to broker between top (steering committee) and bottom (innovation teams), between power and passion.

At the *relational* level, the observations and interviews showed that the innovation teams were in close contact and stuck to their results. Differences in values and goals between the steering committee and the innovation teams, however, led to negative emotions. Deceptions weakened the coherence, but thanks to the positive relations between the group members, the teams stayed committed to their tasks. As a chair/member steering committee said:

‘There was competition between the school directors, but we, in the team, stuck to our ideals and felt committed.’

In *cognitive* respect, some obstacles appeared. All were rooted in the lack of sufficient expertise regarding educational matters and innovation skills. Observations showed that group members were, for example, not able to work in an effective and efficient manner on gathering and interpreting relevant information for designing new products. In their schools, teachers usually work with fixed methods and prescribed procedures, which contrasted strongly with acting as creative designers attempting to solve weak-structured problems. Moreover, the expertise and proposals of the business members proved difficult to apply in the existing school system, which caused de-motivation.

‘There was much difference in level of input by the teachers and the company’s’ (teacher).

‘I had the feeling that not everyone had equal contribution’ (business member).

Most conducive in this phase was the degree of *active* involvement, and stimulating were the linking and bridging activities between groups and within the groups. Almost all members continued to attend the group meetings, which is a sign of very positive collaboration. The project management supported the teams by offering the group chairs training in the design of educational products.

It took more time than foreseen, to design the *products* for the New Academy. The initial approach to create the three educational products, and then to implement these products in the schools and companies, turned out to be more complex than foreseen beforehand. Nevertheless, during a plenary meeting at the end of the first

year, the three teams proudly presented their work and proposed to implement the results as pilot projects in some of the participating organizations, in line with the project plan. Some group members, however, doubted whether these pilot projects would be accepted by their own organizations.

In short: during this phase the cognitive dimension appeared most important, but vulnerable. The actions were intensive, thanks to the positive relations and in spite of structural changes.

Production phase: 'Realities'

This phase saw a number of *structural* changes. The outlines of the three new products had to be further detailed through pilots in schools and companies. Proposals for pilots were judged by the steering committee, and as a consequence mainly pilots proposed by schools were accepted, since proposals of the companies were classified as unrealizable. The 14 new pilot project teams were staffed with members of the innovation teams and additional teachers and personnel from the organizations, that would host the pilot projects. Monitoring of the pilots was conducted by the project management, but the other tasks of the project management prevented a sufficient monitoring of the pilot progress. At the end of this phase, nine pilot projects proved fruitful. Seven were located in educational institutes, one in a company, and one was mixed. In addition, the possibilities of and the barriers to the New Academy became clearer step by step.

During this phase, one and a half years after the official start, a midterm audit by the grant provider influenced the further course of the project deeply. The auditors concluded that the progress was not enough and the goals were too ambitious. The steering committee and the project management felt admonished and adjusted the project plan. From that moment they looked at the project through the eyes of the auditor:

'I did not recognize the passion of the steering committee anymore. It was: We've signed for the project and it must be financially correct' (group chair).

Relations between group members and colleagues in the schools were positive and stimulated collaboration. The project management started detailed guiding and monitoring of some pilot project teams and got first-hand information about the processes. Negative was the discontinuity within project teams, project management and steering committee. Also institutional interests of steering committee members limited the general focus on the New Academy. External forces interfered

with the programme goals, such as reduction of the numbers of students, and competition with other institutes and projects.

More barriers, such as the gap between pilot projects and the structure of schools and governmental rules, or the conflict of interest between educational partner institutes, influenced relations and emotions, enthusiasm turned into deception:

‘It was a waste of time and money. The dream is stopped by the establishment of the educational world. There is no helicopter view, but a culture of minding your own shop’ (business member).

Trust between pilot project teams, project management and committee disappeared. ‘It’s a dead horse’ said the steering committee and the management team confirmed this. Business partners gradually lost their interest because they did not feel an innovative spirit in the educational sector. Rather than the ideals of the professionals, the norms of the auditing organization, seemed to be steering matter. Nevertheless, many motivated and active business members and teachers kept involved and supported the project.

Interviews revealed still a growing difference between experience and **cognition** of the members of the businesses and that of the educational sector. They shared too little common language and common ground. The insight grew that the differences in formal structure between educational institutes with their rules, laws, codes and interests, and the structure of the business domain, were an important hindrance for co-creation. As one group member of a company put it:

‘Wanting something, is not the same as being able to, or allowed to do it. To develop and tackle things is beyond the ability of schools’.

On **action** level, -while it seemed that the steering committee merely awaited the end-, the project management tried to mediate between teams, committee and auditors. A task that would have required more time to have sufficient influence.

Outcomes of this phase were concrete new educational products, but these were not valued equally by top and bottom, schools and business. In short: during this phase structural circumstances caused devaluation of relational capital, cognitive aspects appeared problematic but productive, many necessary activities were unfamiliar.

Dissemination phase: 'Looking for Sustainability'

At the end of the project during the final conference, the steering committee formed two new teams,

'to take care of the sustainable implementation and dissemination of the new products, processes and services'.

The *network* continued to exist, to realize the initial ideals. In this voluntary phase, the participants obviously had more common understanding, knowledge, skills and expertise than in the previous three years.

An interactive opinion poll, conducted during the conference, revealed high levels of *motivated* teachers to continue, despite the disappointments during the last year. They had acquired *cognitive* capital, knew other's resources, and had learned the possibilities and impossibilities of innovation.

'This project could have been so different, if we had known all this earlier...'

The continuing *collaboration* was based on mutual trust and shared goals. In short: structure, relation and cognition was positive, as basis for further co-creation.

4.2 The outcomes of the innovation project

The project had more outcomes than intended and were written down in a final report. We have found intended outcomes, but also incidental outcomes, for organizations and for individual innovators.

Intended outcomes

This 'Limburg Leisure Academy' project was set up to achieve three targets: a career development centre, improved teaching methods for work-based learning, and an assessment centre. These targets were not reached as planned in the initial project plan, however, sixteen educational-organizational products and services were realized, based on the three targets. Seven products concerned the assessment centre, six were examples of improved teaching methods for work-based learning, and three products concerned the career development centre. They are presented in Figure 3 in specific Dutch educational terms.

The answers at the questionnaire, at the end of the three year lasting project, demonstrated the estimated value of these products, according to the participants, for students, teachers and organization.



Figure 3. Products Limburg Leisure Academy

Incidental outcomes

Table 3. Value of incidental outcomes for organization and individual

Nr.	Scale	N items	N	Cronbach's alpha	Mean	SD
1	Value of new educational products for the organization	5	29	.92	3.70	0.84
2	Value of the personal relationships for the organization	7	30	.84	3.58	0.78
3	Value of cooperation between the organizations	4	30	.77	3.74	0.70
4	New personal knowledge and insights	5	30	.86	3.94	0.75
5	New personal expertise	5	30	.82	3.91	0.79
6	New personal innovation capability	6	29	.90	3.50	0.81
7	Personal value for the organization	5	30	.73	3.64	0.77

The incidental outcomes were uncovered by observations, conversations, document-analysis and meetings, and were checked and validated by the participants by the final questionnaire. For management, steering committee and auditing grant-suppliers, this was a surprise, because they had not looked to the outcomes from this perspective. Table 3 presents findings of the questionnaire concerning the value of the incidental outcomes in a very comprised way, the first three scales refer to outcomes for the organizations, the four latter scales concern individual outcomes.

Incidental outcomes for organizations

The mean score of scale 1, regarding ‘the value of the educational products’, (M=3.70, SD 0.84) indicates the usefulness of the products for the organizations involved. The 16 products, realized within the 14 pilot teams, were implemented in participating schools to contribute to students’ learning and professionals’ development. Most innovators were very satisfied. An example:

‘The new third year program is a radical innovation for us. It would not be possible without this project’ (group member education).

The respondents indicated that their own personal relationships had value for their organization, (M=3.58, SD 0.78) and can be helpful for future collaborations.

‘I worked together with a colleague, who I only knew superficial. Now I feel more connected and know what she can offer me. I like to cooperate in the future with more colleagues too’.

The project encouraged the collaboration between organizations, (M=3.74, SD 0.70) which is promising for sustainable collaboration.

‘I learned to know colleagues of educational institutions, even from our own city, and that makes it more easy to contact them for future collaboration’ (group member business).

Yet, the perceptions of the outcomes appeared to differ between the parties involved. Members from the participating companies, for example, were less positive about the achieved results than the education members. The steering committee and project management team considered the overall project results initially not innovative enough, but changed their views on the gains, confronted with the positive findings during the final conference:

'We are afraid we were wrong last year because we did not look at the results in the right way' (chair steering committee).

Obviously, the steering committee was focused mainly on the planned, intended outcomes, and had hardly noticed other spinoffs.

Incidental outcomes for the individual professionals

Apart from the products for the organizations, four important outcomes for the individual participants emerged in the course of the project. Teachers, but also project management and steering committee, reported during interviews or personal communication with researchers, that the project offered beneficial opportunities for competency development, not present in their daily work.

'I learned so many things during this project. Such as working together in a team, to participate in a project with more organizations, to build a network. All things that do not belong to my daily work as practical teacher, but I like it' (chair education).

This was checked and demonstrated by the final questionnaire. The scales 4 to 7 in Table 3 refer to these personal outcomes. The mean score (M= 3.94, SD 0.75) of scale 4, indicates that participation in the project had resulted in new knowledge and insights, for example concerning other participating educational institutes and the educational methods they applied.

'Finally now I know what the aberrations mean of the professional education streams. It is now easier to talk and cooperate with them, and to arrange practical placements' (group member business).

Project members also stated their own professional expertise further developed (M= 3.91, SD 0.79) but evaluated the improvement of their innovation capability slightly less positive than, for example, their skills to work in multidisciplinary teams (M= 3.50, SD 0.81).

'We learned a lot from each other. Not theoretical, but by doing' (group member education).

'Visits to other schools opened my eyes for new methods' (chair education).

'It is not easy to design a new method in such a heterogeneous team. Of course it is very interesting, but you have to plan, to deliberate, to take a

decision, to talk with the management. Interesting, but I still have to learn a lot' (group member education).

Finally, they considered their participation in this project had increased their value to contribute to the goals and activities of their organization (M= 3.64, SD 0.77).

'I now feel still more committed to my company, and think I am able to promote its development as part of the Leisure Industry' (group member business).

The modest standard deviations of these four latter scales indicate that respondents did not really differ regarding the personal benefits of the project.

5 Discussion and Conclusion

The Social Capital model of Nahapiet and Ghoshal (1998) was applied to an innovation project that reflects the features of an Industry-School Partnership innovation project to explore the dynamics of the processes and the outcomes of this project, and to discover ways to sustain innovating professionals. With this model the incremental change was assessed and by doing so the change in Social Capital that has occurred over time, for example, how networks, cognition and trust have changed between start and end (Cavaye, 2004). Hidden process factors and outcomes could be unravelled, with their systemic relations and interdependency.

Sixteen factors play a paramount role in the process, and seven kinds of outcomes could be discerned. Figure 4 presents these findings as a summary. The process factors are ordered according the four Social Capital dimensions: structure, relation, cognition, action. Outcomes involve: intended outcomes for the organization, and incidental outcomes both for organization and individual professional.

Based on the findings it is possible to answer more specifically the research questions about the process and outcomes of this innovation project, with the Social Capital lens.

The first research question concerned the question which of the Social Capital dimensions stimulate the innovation process and how is their development. As Figure 4 demonstrates, all four dimensions played a role, from the initiation to the closing of the project. The analysis of the process description showed that the structural dimension seemed most important in the first and second phase, the relational

played an important role in all phases, the cognitive mostly in the middle phases, and the action dimension was most visible and important at the end of the project. The study indicates that all dimensions of Social Capital play a role and their relevance differs per phase. The 16 process factors, that could be discerned, proved necessary to allow the project going on, to motivate and sustain the actors, to enhance the quality of the process, and to reach results. Although in Figure 4, the dimensions are presented separately, in reality they are interdependent and influence each other organically. Nine of these 16 factors are found as well by Kirschner and colleagues (2004) in their literature review on success- and fail factors of large-scale educational innovation, while the importance of trust, pleasure and understanding is found also by other scholars (Flynn 2013; Longworth and Osborne 2010; Poell 2006; Van der Klink and Streumer 2006). With this present longitudinal, participative, study of a large-scale school-business programme, new evidence is demonstrated about these factors.

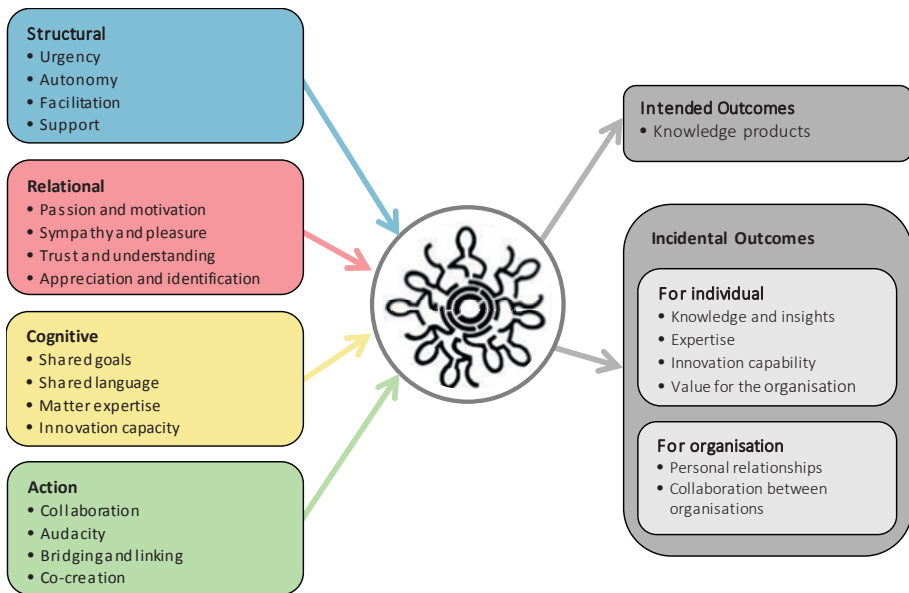


Figure 4. Process factors and outcomes of the innovation project

The second research question focused on the outcomes of the innovation project for participating organizations and professionals. The project delivered intended new educational and organizational products for the organizations, and also incidental outcomes, as it implies individual and collective learning effects. This combination of organizational and personal results, is often not registered in project reports, but is confirmed by findings of other researchers about educational innovation (Flynn

2013; Kessels 2004; Verdonshot 2009). Two remarks should be made about these outcomes of innovation programmes. Firstly, success appears to be a matter of perspective. Often innovation projects are labelled as a failure if the planned goals are not reached. This case shows that innovation is not a matter of reaching intended goals, but a peculiar creative process of professionals who, collaboratively reach the results that are feasible. It is their power to discover, often from scratch, what is wishful and realistic. A condition is their ownership, motivation and engagement. The sustainability of the results depends on the feasibility to further develop and implement the new products, as well as of the support of the colleagues in the organization. Secondly, even if no concrete products result, or if the products seem not realistic, then, as this project demonstrated, the incidental, intangible outcomes for professionals and organizations, are valuable results. These outcomes could be described as 'double-loop-learning' (Argyris 2004), and are, presumably, the most sustainable innovation results (Castelijns Vermeulen and Kools 2013; Kessels 2004).

The third question is, how can innovating professionals be supported? As more studies have shown (Moolenaar 2010; Slater 2013), this study demonstrates that the members of the innovation teams are the main actors. A supporting environment in which they can play their role, is ideally a necessary condition:

- The project management offers autonomy, time and facilities; mediates between teams and steering group; creates an open and stimulating atmosphere. Raise the level of expertise and offers training if necessary; communicates about process and results with the surrounding environment.
- The board and colleagues of the home organizations show attention to the innovators.
- The steering committee has an open mind and respects the developments and results of the teams.
- The chair of a team creates an atmosphere of trust, respect, understanding, and enthusiasm, ensures team safety and team efficacy (Edmondson 2002);
- Team members show passion, enthusiasm and respect; share knowledge, bridge and link to external experts and demonstrate courage to act.

Several advantages and limitations of this study have to be considered. The longitudinal approach, from the beginning until the end of the project, revealed the dynamics of the processes, in and in-between the phases and in-between the different levels of actors. This kind of research, starting with participative observation, continuous document-analysis, followed by in-depth interviews and a final questionnaire and member-check, provided the possibility to be 'in' the process and to gather rich and detailed data. Collecting and analysis was a joint reflection process of researchers and participants, and, perhaps, this is the main contribution to practice.

The combined role, researcher and consultant, provided the innovators and the management with useful insights during the project and reinforced their learning effects. A condition for such a long, time-consuming, collaboration between researchers and participants nevertheless, is a relation of trust and acceptance. Also the large set of data requires considerable time for analyses. At least the involvement of two researchers is required, to ensure sufficient quality of the analyses.

The Social Capital theory can be considered a revealing, systemic, framework for gaining an in-depth understanding of the processes in which innovating actors are involved. The study indicates new avenues for further studies on educational innovation from Social Capital perspective, such as the creation of powerful networks and teams, the improvement of relational and emotional competences to innovate, the role of appreciative, shared leadership, and collaborative implementation. Action research is a method that enhances the reflective ability of innovators in collaboratively working and learning together. Implementing the research framework in other settings could further validate its use in this line of research.

Finally, this study shows that not the plan or the management, but the 'social' is the engine that creates 'capital' in educational innovation. It requires autonomy, support and facilitation, creative space, and trust. A developmental approach and shared leadership proves to be stimulating. Looking at innovation with this 'Social Capital' lens, will shed another light on its contribution for both the organization and the professional.

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Appendix 1

Limburg Leisure Academy final questionnaire

Questionnaire for members of innovation teams of an industry-school-partnership about results and influencing factors

Dear team member,

At the end of this research project I kindly want to ask you to reflect on the results.

What are the results?

What were benefits for you?

What were benefits for the students and for the organization

Which factors were enhancing or inhibiting?

Please fill out the questions in next file.

Thanks a lot for your precious contribution.

The researcher

PLEASE MARK THE RIGHT ANSWER

(PG = project group = innovation team)

(pilot = pilot group = pilot team)

Are you employee of an educational institution?	Yes	No
Are you employee of a business organization?	Yes	No
In which period did you participate?		
In which PG did you participate?		
In which pilot group did you participate?		

A PROJECT RESULTS

Next questions refer to the quality of the results of the PG's and of the Pilots, and of the influencing factors.

Please fill in the questions from the perspective of the PG or Pilot involved. Put a cross in the box that suits best your opinion.

	No improvement	Some improvement	Improvement	Innovation	Radical Innovation	Not applicable
1a The results for the students of my school are						
1b The results for the teachers of my school are						
1c The results for the sector are						
	Totally agree	Agree	Agree nor disagree	Disagree	Totally disagree	Not applicable
2a Looking back% of the expected results are reached						
2b The results align with the vision in the project plan						
2c The results were of a high level						
2d The results are valuable to continue						
	Totally agree	Agree	Agree nor disagree	Disagree	Totally disagree	Not applicable
3a My contribution to the results was important						
3. The contribution of my group members to the results was important						
3c The contribution of the project management to the results was important						

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3d The contribution of the steering committee to the results was important						
	Totally agree	Agree	Agree nor disagree	Disagree	Totally disagree	Not applicable
4a Enhancing was/were: the mixed composition from business and education						
4b the dedication and commitment of the team members						
4c the social relations						
4d the shared goals						
4e the subject matter expertise of the team members						
4f the team spirit						
4g the innovation capacity of the team members						
	Totally agree	Agree	Agree nor disagree	Disagree	Totally disagree	Not applicable
5a Very inhibiting was/were: the rules of the government						
5b the different interests of the educational institutions						
5c the different interests of the enterprises						
5d the lack of decision-making power						
5e the diminishing number of students						
5f the lack of urgency within the sector						
5g the lack of support in my organization						
Please mention here all comments, that is important for the researcher to achieve a good understanding of the results and the enhancing and inhibiting factors concerning the PG or the Pilot.						

B BENEFITS FOR YOU AS PROFESSIONAL

	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
1a I learned a lot: about educational methods					
1b about other educational organizations					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
2a I gained insights in: processes and interests in educational domain					
2b practice enterprises for students					
2c working processes and interests of enterprises					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
3a I got to know: many new colleagues in educational domain					
3b many new colleagues in the field of enterprises					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
4a I learned how to: work together as a team					
4b participate in a large-scale innovation project					
4c I would like to learn more about.....					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
5a I have improved my competence: to work together in an innovation team					
5b to maintain a network					
5c to develop educational products					
5d consulting and negotiating					
5e to create a good atmosphere					
5f to maintain relations					
5g to consider different interests					
5h to communicate and to give presentations					
5i to					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
6a By participating in this project: I can do more for my students					
6b I can do more for my colleagues					

6c	I can do more for my organization					
6d	my job has become more interesting					
6e	I have got more career opportunities					
		Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
7	Next time I better know to handle innovation					
8	Next time I certainly will participate in an innovation project					
Please mention here all comments that are important for the researcher to achieve a good understanding of the benefits for you as professional						

C BENEFITS FOR YOUR ORGANIZATION

Next questions address the sustainable value of the project for your organization.

It concerns the educational results as well as new required abilities and the collaboration with colleagues of other organizations.

		Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
1	Without the cross-organizational nature of the project the educational products would not have been developed.					
		Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
2a	The new educational products: are an improvement for my organization					
2b	are an innovation for my organization					
2c	will be implemented by my organization					
		Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
3a	After the project: my new knowledge and skills are applicable in the organization					
3b	By the project: I have become capable to develop innovative educational products					
		Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
4a	The mutual relationships between the organizations were based on: Trust					
4b	Shared vision					
4c	Shared goals					
4d	Transparency					
4e	Good atmosphere					

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4f Knowledge					
4g Shared activities					
4h					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
5a The collaboration with colleagues of other organizations is important for my organization					
5b better than expected					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
6a The collaboration with colleagues of other organizations will: lead to more innovation in future					
6b be continued					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
7 The spin-off of the new developed knowledge and skills is big					
8 The results for my organization would have been better if					
9 As results of this project I had expected					
10 The best result of this project is					
11 My organization has become more innovative					
	Totally agree	Agree	Nor agree nor disagree	Disagree	Totally disagree
12 As follow-up of this project could be developed.....					
13 I would like to join these activities in future					
Please mention here all comments, that is important for the researcher to achieve a good understanding of the benefits for your organization.					

Thank you for your collaboration



Knowledge Productivity for Sustainable Innovation: Social Capital as HRD Target

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Abstract

Purpose – Purpose is to test the feasibility of a conceptual model on relations between organizational innovation, knowledge productivity and Social Capital. It explores processes of knowledge productivity for sustainable innovation and associated HRD implications in knowledge intensive organizations, taking the perspective that Social Capital is a key influencing condition.

Design – This qualitative case-study concerned a large-scale innovation project between knowledge-intensive organizations. Semi-structured interviews were conducted with 20 participants from six innovation groups as well as with the overall project management.

Findings – Findings showed that four dimensions of Social Capital influence knowledge productivity, each requiring a minimum quality to create a rich innovation environment for sustainable results. The relational and cognitive dimensions seem important, while the action dimension makes them productive. Knowledge productivity appears twofold, i.e. organizational innovation, and professional ability for future innovation. Found are 18 new indicators.

Practical implications – It is suggested that project management, group leaders and HRD officers target Social Capital as condition for knowledge productivity that should be stimulated, not just by planned interventions, but by ‘being’ there as supporter, coach and mediator.

Social implications – The study provides new insights in conditions for sustainable innovation in and between organizations.

Originality – The article contributes to our knowledge about innovations in knowledge-rich organizations, broadens the concept of knowledge productivity, and provides a framework of Social Capital as intervention model for HRD. In addition, not often dealt with in literature, the dynamic of innovation is shown.

1 Introduction

Organizations will only survive global competition if they are able to innovate permanently (Drucker, 1993, 1999). The ability of employees to create new knowledge, in terms of both products and of services, in order to maintain their market value is crucial. This emphasis on permanent innovation transforms the workplace into a setting for learning and innovation (Billett, 2008; Van Woerkom and Poell, 2010).

Unfortunately, innovations often seem to be unsuccessful, leading to frustration and failure, while sustainability appears to be problematic (Beer and Nohria, 2000; Tidd et al., 2001). In dynamic and sometimes chaotic organizations, employees need to have more than average competences to innovate (Cozijnsen and Vrakking, 2013; Weick and Quinn, 1996). In order to increase the success rate of innovations, it seems vital to acquire expertise on how professionals in workplaces produce knowledge within innovation groups, what problems they face and how they can improve their ability to realise successful innovations.

Although organizational innovation receives substantial attention from researchers, little is known about the interpersonal processes that provide incentives for innovation, about factors stimulating the innovators (Kirschner et al., 2004), and the role of human resource development (Kessels and Poell, 2004) in sustaining these processes. To gain a deeper understanding of such processes more systematic empirical research needs to be performed. Kessels and Keursten (2002) have already signalled this and more recently other scholars have made similar arguments (see for example Billett, 2008; Poell, 2012a; Schilling and Kluge, 2009).

On some topics both theoretical and empirical research has been performed, in particular a research programme on 'knowledge productivity' at the workplace, a concept formulated by Kessels (Kessels, 1995; Keursten et al., 2003). Other studies on the factors affecting knowledge productivity within organizations have revealed that aspects such as social connections, good interpersonal relationships, shared goals, commitment and shared resources are crucial for enhancing knowledge productivity (see for example Keursten et al., 2006; Stam, 2007; Verdonschot, 2009). A literature review by Du Chatenier et al., (2009) resulted in a model describing 'knowledge creation' within collaborative teams. This model was rooted in a total of nine models found in literature. It restricts itself to cognitive processes of collaborative knowledge creation and does not explain problems, conflicts and challenges. Du Chatenier discovered 19 factors influencing the struggles of innovation teams. These factors involved cognitive, relational, emotional and structural categories.

Inspired by the findings of Stam (2007) and Verdonschot (2009), De Jong (2010) further developed the factors affecting knowledge productivity from the perspective of Social Capital theory. For this purpose, De Jong applied Nahapiet and Ghoshal's Social Capital model, which appeared to provide a good framework for discerning the social processes in innovation networks (Nahapiet and Ghoshal, 1998). Based on the findings of their in-depth case study research, Ehlen et al., (2012) advocated a further strengthening of the relationship between knowledge productivity and Social Capital. The authors provided evidence for adding a dimension to the model proposed by Nahapiet and Ghoshal (1998), i.e. the action dimension. This action dimension allows us to describe and explain the activities of innovators in the dynamics of the innovation process and its outcomes.

This present study focuses on a further elaboration of the action dimension and its connection with knowledge productivity. The purpose is to test the feasibility of a conceptual model on sustainable organizational innovation, linking the model of Social Capital with the model of knowledge productivity and with external conditions. Associated HRD implications are discussed.

A large inter-organizational programme within the healthcare domain was used to collect data. This involved a unique innovation construct between organizations within the private, public and education sector in a European region with urgent demographic problems such as an ageing population and a future shortage of qualified professionals. The programme was selected twice as the best European innovation programme within the healthcare sector.

2 Conceptual Model for the Relations Between Organizational Innovation, Knowledge Productivity and Social Capital

The model presented in this study concerns the relationships between three interrelated concepts: organizational innovation, knowledge productivity and Social Capital. The model connects Kessels' concept of knowledge productivity (1995, 2001) with Nahapiet and Ghoshal's model of Social Capital (1998), with the objective of finding significant factors which provide incentives for organizational innovation.

Figure 1 shows the interrelatedness of these concepts and demonstrates knowledge productivity and organizational innovation as results of both Social Capital and external conditions. The process of knowledge productivity should be explained as an application of one of the dimensions of Social Capital – the action dimension – and

as influenced by three other dimensions of Social Capital. External conditions influence both Social Capital and knowledge productivity. The products emanating from the knowledge production process are twofold, organizational innovation and the personal ability of professionals.

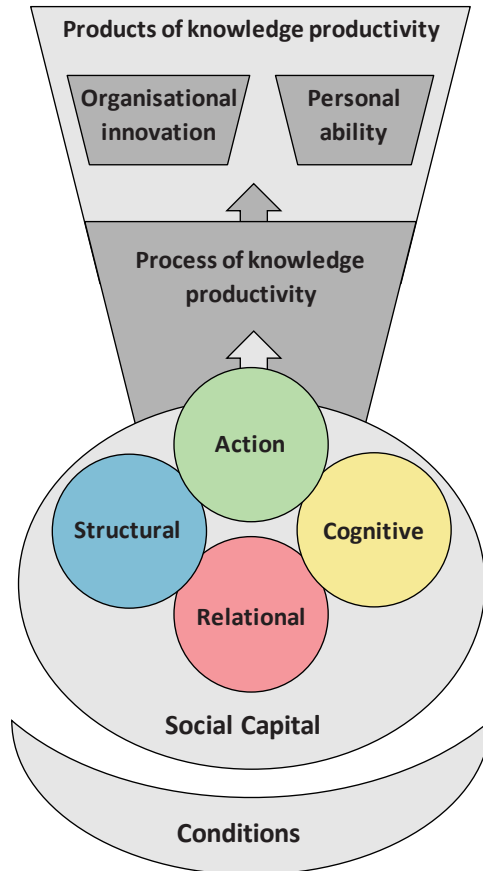


Figure 1. Model of process and products of sustainable knowledge productivity (Ehlen, Roentgen, van der Klink & Boshuizen, 2013)

'External conditions' are accidental or consciously created circumstances and actions which increase or diminish Social Capital.

'Social Capital' has four dimensions: structural, relational, cognitive and action.

The *'process of knowledge productivity'* is an application of the action dimension, and is defined as the set of learning and designing activities within innovation groups which aim to improve and/or innovate in work processes, products or services.

The innovative *'products of knowledge productivity'* are also twofold. These refer to new work processes, products, or services for an *organization* and to the acquired *abilities* for future innovation of the *professionals* involved (Kessels et al., 2011).

2.1 Organizational innovation

Innovation often appears unsuccessful, resulting in frustration, while sustainability remains a problematic issue. In addition, research has revealed that top-down innovations, lacking support within the organization, often turn out to be unsuccessful (Beer and Nohria, 2000; Miedema and Stam, 2008). Policy-makers are becoming increasingly aware of the urgency of achieving innovation goals that remain sustainable. The present study applies Walz and Bertels' definition (1995) describing innovation as a gradual improvement or as a radical innovation. Gradual improvement elaborates on what is present and results in additional refinement and specialisation. Radical innovation breaks with the past and creates new opportunities by deviating from tradition. The traditional view of innovation as a linear process has been challenged by theories that see innovation as a complex process, involving many actors, their relationships and the social and economic context in which they are embedded (Westley and Antadze, 2010), or as 'chaordic' (Hock, 1995) involving size, multidisciplinary, diversity of goals, variety in interest groups, and expected products.

Innovation does not only result in targeted products, services and processes, but also affects participating professionals. In many cases, innovation requires new abilities, which have to be learned during the innovation process and have to become integrated with existing abilities. The commitment and involvement of professionals in this process are important prerequisites for sustainable innovation. Research has shown that innovations tend to be more sustainable if professionals further develop these new abilities into resources for further action (Verdonschot, 2009), as these abilities and knowledge lead the organization to improvement and innovation (Drucker, 1993). Insight into ways to stimulate professionals to become knowledge-productive is greatly needed in complex organizations, and how to enhance innovation capacity within organizations has become an important question for HRD.

The distinction between innovation outcomes for the organization and outcomes in terms of individual professional capabilities seems useful for HRD as it can be a leverage point for the systematic improvement of capabilities. Previous empirical studies (Ehlen et al., 2012; De Jong, 2010; Tsai, 2001; Verdonschot, 2009) have demonstrated the quality of relationships between professionals as a success factor. Social Capital theory describes this relational factor.

2.2 Social Capital

Social Capital theory contributes significantly to our understanding of the determinants of success of innovations in various sectors and countries (Field, 2005; Tsai, 2001). The appeal of the concept stems from its integration of social connections with productive value. With reference to scholars such as Bourdieu (1986), Coleman (1988), Nahapiet and Ghoshal (1998) and Kessels and Poell (2004), this study defines Social Capital as the network of social relations, based on shared norms and goals, trust and good atmosphere, by which material and knowledge resources become available that are useful for the actions of the members of the network.

Nahapiet and Ghoshal (1998) created a frequently-applied model of processes of knowledge creation through Social Capital. This model operationalised the impact of three dimensions – structural, relational and cognitive – on processes of knowledge creation. Unfortunately, their analysis is unclear about the way in which knowledge creation happens. The authors described this as collective actions of a certain quality, which finally created the new knowledge value. Later scholars (Kaasa, 2008; Hanson, 2008) mentioned these collective actions but did not operationalise them.

In a previous study on Social Capital and innovation (Ehlen et al., 2012) we added these collective actions as the fourth dimension to the model of Nahapiet and Ghoshal, and labelled this dimension the ‘action dimension’. This study showed that innovation processes depend to a large degree on the dynamics of these four dimensions of Social Capital. The ‘structural’ dimension addresses properties of the group: ties, positions, and time spent. The ‘relational’ dimension addresses aspects of personal relationships: trust, respect, norms, expectations, identity and identification. The ‘cognitive’ dimension addresses shared language, values and goals, capacities and material resource. The ‘action’ dimension addresses collective activities: networking, collecting and sharing knowledge, designing and implementing. It renders the other three dimensions productive. The concept of ‘knowledge productivity’ offers a framework to further investigate these actions.

2.3 Knowledge productivity

The concept of knowledge productivity is based on the idea that knowledge is a competence linked to persons. As Malhotra states: ‘Knowledge needs to be understood as the potential for action that does not only depend upon the stored information but also on the person interacting with it’ (Malhotra, 2000, p. 249). Becoming knowledge-productive can be seen as acquiring new skills and attitudes as part of a personal competence. Having access to meaningful work means having access

to powerful learning environments and remaining valuable and productive for society (Marsick and Watkins, 2001).

Innovating in products and services presupposes sharing knowledge in order to create something new. This process of sharing knowledge by which new knowledge is created within the workplace is described by Kessels (1995, 2001) as 'knowledge productivity' building on terms such as 'knowledge society', 'knowledge worker productivity' (Drucker, 1993, 1999) and 'knowledge worker' (Nonaka, 1995). Knowledge productivity refers to the competence of individuals and groups to gradually improve and radically innovate in operating procedures, products and services. This process entails tracing relevant information, using this information to develop new abilities, and applying these abilities to improvement and innovation (Kessels, 2004). The concept of knowledge productivity includes the creation of knowledge products separate from the creation of personal abilities (Kessels et al., 2011). Improvements or innovations may be of great economic value, but the most sustainable value lies in the abilities of the professionals to generate such improvements and innovations in the future (Kessels, 2001).

Empirical studies on knowledge productivity have demonstrated concrete activities of knowledge productivity and different types of outcomes (De Jong, 2010; Keursten et al., 2006; Stam, 2007; Verdonshot, 2009). The studies have shown that the knowledge activities presume a stimulating work environment with good relationships between employees. Creating a powerful learning environment should therefore be seen as an important field of action for HRD (Kessels, 2004).

In order to gain a further insight into the Social Capital of innovators and into knowledge productivity resulting in sustainable innovation, the following research questions were put forward:

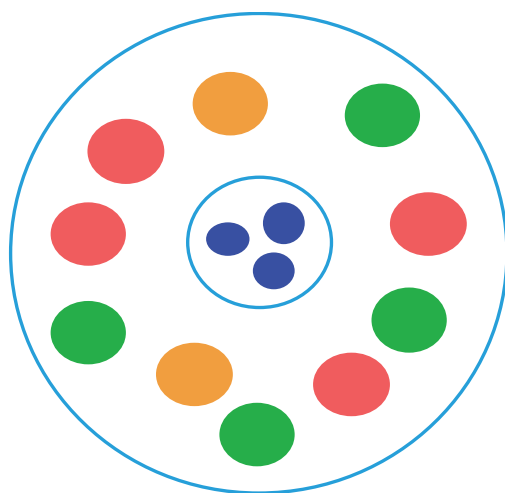
- 1: *Which knowledge-productive activities lead to improvement or innovation for the organization?*
- 2: *Which knowledge-productive activities lead to new capabilities among the professionals?*
- 3: *Which dimensions of Social Capital stimulate these knowledge-productive processes?*
- 4: *Which external conditions stimulate Social Capital and knowledge-productivity?*

3 Method

The study entailed the examination of a large-scale inter-organizational innovation programme. Claridge (2004) and Grootaert et al., (2004) suggested that investigating Social Capital requires a research design that includes more than simple cause-and-effect relationships. The present study, which has an explorative and qualitative nature, builds on these suggestions. A case study design has been applied involving six innovation groups (Yin, 2003). Semi-structured face-to-face interviews have been used for data collection.

3.1 Setting and participants

The case study concerned a large-scale three-year inter-organizational innovation programme. It entailed a collaborative initiative involving the vocational, secondary and higher education sectors, four organizations within the healthcare domain, and two governmental organizations (ZAP). The grant-giver was the Dutch government, represented by the Vocational Education Platform. See Figure 2.



grant-giver - steering committee - project management
 health care education government

Figure 2. Project ZAP (Health Care Academy Parkstad)

The programme aimed to connect vocational training, higher education and research more closely to future needs in the healthcare domain. Its objective was to

create a new Healthcare Academy as an inter-organizational construct. All participating organizations acknowledged the need to adapt professional education to future professional developments and to design new technological products for healthcare practices. The programme was managed by a management team and by a steering committee consisting of representatives from the participating organizations and from the regional government.

Six project groups were formed, each comprising six to eight persons. Each group consisted of employees from the participating organizations. The group members were selected according to their expertise, their motivation and their connection with the specific task at hand. Most did not know each other beforehand and varied significantly in their experience with innovations and in professional position. For some it was the first time they collaborated in projects. The professional positions of the team members ranged from university professor to HRD manager or vocational training teacher. Most of the participants had not been involved from the beginning, while others participated from the very start. The project groups (PGs) had to design and develop the following products, processes or services:

PG1: Procedures for Recognition of Prior Learning

PG2: Blended Learning Modules

PG3: Tailor-made Vocational Training Programmes

PG4: A Virtual Environment

PG5: Care Innovation

PG6: Strategic Human Resource Planning

Twenty participants were interviewed: for each group the chairman and two randomly selected members. The interviewees represented six organizations: three from education, two from healthcare, and one from the government. The two programme managers were also interviewed.

3.2 Design and Instrument

Semi-structured face-to-face interviews were conducted in order to ensure in-depth insight into the object of this study (Rubin and Rubin, 2005). Based on an instrument that was applied in a previous study (Ehlen et al., 2012) two researchers (CE and UR) developed interview guidelines that covered the four categories of the research model: conditions, Social Capital, process and products of knowledge productivity. These guidelines served to guarantee inter-interviewer consistency. Indicators of the four categories were used to formulate more specified questions.

The indicators that were used to collect data on the four categories are presented in Figure 3. The operationalisation of the category ‘Social Capital’ is based on the indicators derived from Ehlen et al., (2012), while for the operationalisation of ‘knowledge productivity’ the work of De Jong (2010) was consulted.

The interview guidelines consisted of 30 questions about positive and negative experiences, stimulating and hindering factors, internal and external communication, and positive and negative activities of group members, chairmen, programme managers and the steering committee. Fifteen questions focused on general programme goals, activities and outcomes, while the other 15 concerned specific group goals, activities and outcomes. The instrument was piloted, which resulted in minor adaptations concerning the indicators. Table 1 shows examples of interview questions.

Table 1. Examples of interview questions with category and indicator

Question	Category and Indicator
Which factors were stimulating or hindering for reaching your goals?	Conditions
Has there been support or commitment within your organization? Can you specify this?	SC Structure
What did you expect at the start of the programme?	SC Relation
How did you gain external expertise?	SC Cognition
Which positive and negative activities of the actors in and outside your group did you see during the project?	SC Action
How did you design the new product, process or service?	KP process: improvement or innovation
Can you give examples of moments when you learned something?	KP process: increasing ability
Are the new products/processes/services already used or implemented? What is their value for different groups of users?	KP product: organizational innovation
Which new knowledge or abilities did you learn?	KP product: ability to innovate

* SC = Social Capital

** KP = Knowledge Productivity

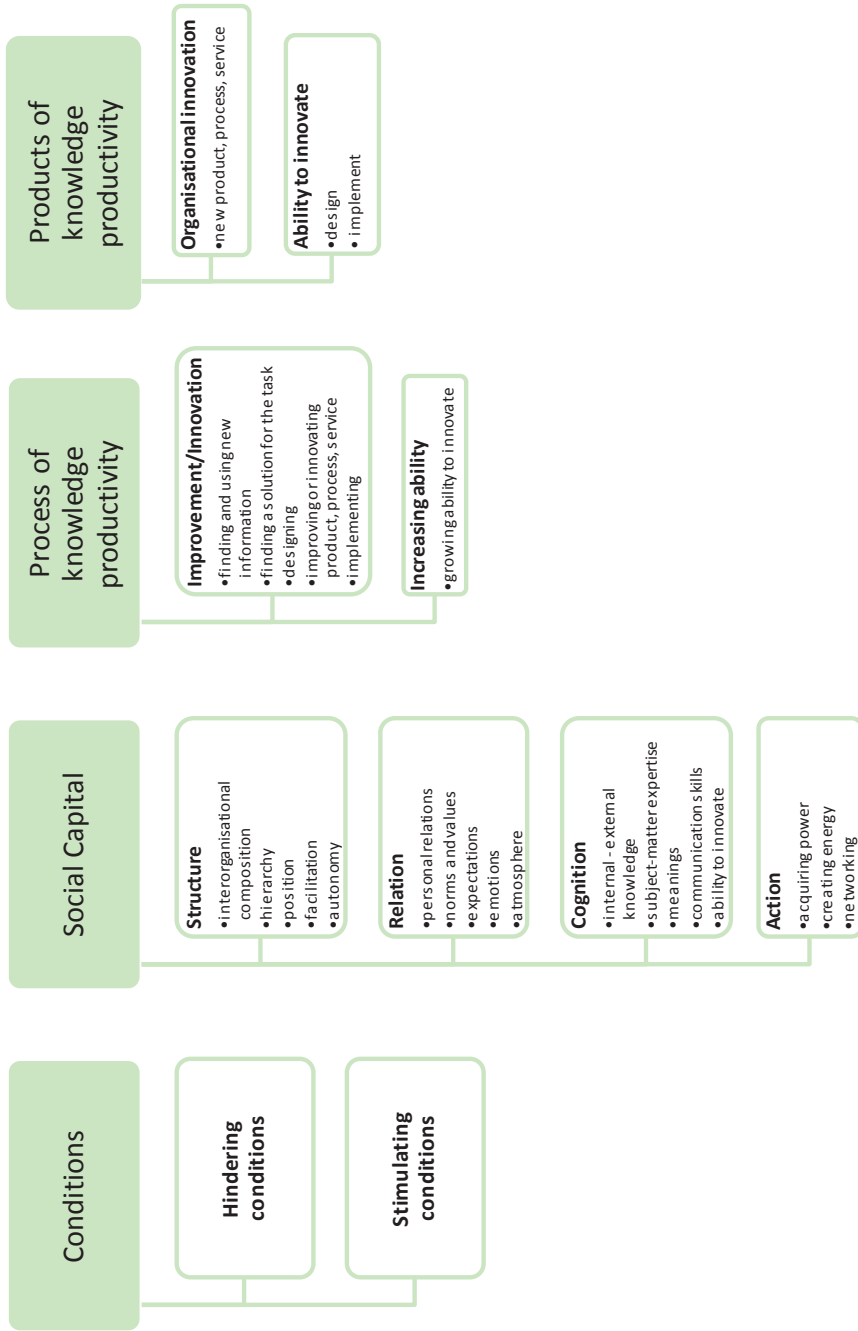


Figure 3. Indicators of the four categories of the research model (Ehlen, C.G., Van der Klink, M., & Boshuizen, H.P.A., 2013)

3.3 Data collection

Data was collected between November 2011 and March 2012, which was the final year of a three-year innovation programme. The 20 interviews of 1 – 1.5 hours were conducted by three interviewers, after they had been instructed by one of the researchers. Another researcher performed the interviews with the programme managers. During the interviews an open atmosphere was created, and the interviewers avoided judgmental reactions. Each interview was audio recorded and the transcript was mailed to interviewees for validation.

In addition to the interviews, the researchers consulted programme documents (programme plan, mid-term and final reports, and report of an impact survey), and attended two meetings – of chairmen and programme managers, and a plenary meeting – to gain a better understanding of the entire programme.

3.4 Data analysis

In order to ensure the quality of the analysis process, the same two researchers (CE and UR) analyzed the data collected using qualitative content analysis (Miles and Huberman, 1994) and a third researcher (EC) double-checked the result. The unit of analysis was the process of knowledge productivity within the groups.

To reduce the vast amount of qualitative data, a procedure of eight iterative steps was carried out:

1. The categories and indicators for the four research elements (Figure 3) served as a scheduled framework for deductive ordering and analysis of the data;
2. The 20 reports were arranged according to the six innovation groups and position of the interviewees;
3. Each interview report was analyzed, based on the indicators in Figure 3;
4. The analyzed reports were then synthesized, with the objective of gaining a complete picture of the process and products of each of the six innovation groups and its actors;
5. An in-case analysis was made of each group according the research questions;
6. The results of each group were compared in a cross-case analysis, according to the interview topics;
7. The findings were summarised in a report on each group and on the general research elements (Ehlen and Roentgen, 2012);
8. A third researcher (EC) performed a double check on the selected and analyzed elements of the reports.

4 Findings

The findings will now be presented according to the elements of the research framework (Figure 1). Table 2 and 3 present illustrations of the categories and their indicators, illustrated by fragments taken from the interviews and documents. Some indicators were not reported in previous studies and these new indicators are stated *in italics*.

4.1 Conditions

The analysis revealed four conditions which appeared to influence the project groups positively: urgent work-related problem, smart task formulation, managerial support and autonomy, respectively. With exception of the first one, the other three were not reported in previous studies (see De Jong, 2010; Verdonschot, 2009).

An urgent work-related problem appeared to be necessary to obtain grants, policy power, and motivation. The majority of the participants emphasized the necessity of 'a smart task formulation' from the beginning: not too vague, not too big, and acceptable. It took considerable time to discern all task aspects, to find and share the relevant knowledge and to see that it is feasible to fulfil the task at hand. Managerial support, especially with regard to allocating sufficient time and facilities to the project groups appeared to be essential. Also sufficient autonomy for the project groups turned out to be very important. The groups needed to feel safe in order to develop new products that would possibly change the work of colleagues or the organization structures.

Table 2. Stimulating conditions and dimensions of Social Capital

Conditions	Indicators	Interview fragments
Stimulating conditions	Urgent work-related problem	'Then new products will provide an answer to organizational questions' (chairman).
	<i>Smart' task</i>	<i>'I was struggling a lot in the beginning; finally the task became transparent and we could go ahead' (chairman).</i>
	<i>Managerial support</i>	<i>'Slowly I felt free to act because I knew that it was allowed to learn from trial and error'. (members).</i>
	<i>Autonomy</i>	<i>'Institutions had to give up their institutional autonomy and to delegate decision power to the groups, (programme manager).</i>
Social Capital	Indicators	Interview fragments
Structure	Multi-disciplinarity	'The multi-disciplinarity helped to solve inevitable conflicting interests within this complex structure' (member).
	<i>Continuous participation</i>	<i>'This led to changing ambitions, vision and capacities, and to loss of passion of initial innovators' (chairman).</i>
Relation	Positive relationships,	'An open and pleasant atmosphere is necessary to deal with uncertain situations' (member).
	<i>Time to get acquainted</i>	<i>'This process of 'discovering' each other, required more time than expected' (chairman).</i>
	Collaboration	'Even organizations seek collaboration among each other, the doors are really open' (member).
	Shared goals and values Team spirit	'We formulated a goal, accepted by all members' (member). 'Our group members wish to be part of a motivated group with the courage to innovate'. (chairman).
Cognition	Capability to understand each other	'It was necessary to get to know each other's jargon, vision, and meaning about the task' (member).
	Collective subject-matter expertise	'We were experts in our regular jobs' (member).
	Ability to link and bridge	'If we lacked subject-matter expertise, we asked for help in our external network' (member).
	Adaptive capacity	'It was trial and error to find new solutions. Luckily some dared to think 'out of the box' (chairman).
Action	<i>Managerial activities</i>	<i>'We had to perform financial management, public relations; we had to solve conflicts and so on'. (programme manager).</i>
	<i>Guiding the group</i>	<i>'Our fantastic chairman created a good atmosphere, a clear work plan, and gave compliments'. (member).</i>
	Linking	'Group members and myself needed to collect information within and outside the group' (chairman).
	<i>Implementation</i>	<i>'Presenting the new products at the right moment to the right persons' (member).</i>
	<i>Supervision by board and grant-givers</i>	<i>'They will advocate for the programme externally' (chairman)</i>

Table 3. The process and the products of knowledge productivity

Process of knowledge productivity	Indicators	Interview fragments
Improvement and innovation	<i>Collaboration</i>	'We built the product we aspired to realise step by step' (member)
	Collective qualities	'Seeking external experts, gathering information and combining this' (member).
	<i>Planning, decision power</i>	'Hindering is lack of decision-making, little work planning' (member).
	<i>External pressure</i>	'People outside have expectations, so you have to continue without delay' (member).
	<i>Enthusiasm and pleasure</i>	'Working together with enthusiasm and pleasure, fuelled us with energy' (member).
	<i>Acceptance of outcomes</i>	'It is not realistic to expect one can achieve all goals of such a huge programme' (member).
	Dissemination	'New information was disseminated to organizations that had to implement this product' (chairman).
Increasing ability	Improving personal capabilities	'It is inspiring to learn new things which I can use later on'.(member).
	Insight into innovation process	'It is a creative process with an own development, impacted by many factors that can hardly be influenced'(chairman).
Products of knowledge productivity	Indicators	Interview and document fragments
Organizational innovation	Products, work processes, services	The innovation programme created among other things: <ul style="list-style-type: none"> 1. Certification of RPL procedures, e-portfolio, training for field-assessors and coaches. 2. 'Blended Learning Modules, an e-portal and a quality care procedure. 3. Competence profiles, intake system and a skills lab. 4. A virtual environment. 5. Distant home care, robotics. 6. Training for HRM officials, plans for future collaboration.
	Network	'Outcome is a network between education, healthcare and government' (chairman).
	<i>Collective creativity</i>	'Result is the collective creativity and a look in each other's kitchens'(chairman).
	<i>Emotional results</i>	'The New Academy makes us proud, gives recognition and inspires us to tackle important problems together' (programme manager).
Ability to innovate	Growth of competences	'I learned about specific content and innovation processes; to take steps, to have courage' (member).
	<i>Motivation and self-trust</i>	'I am eager to cooperate in future on inspiring ideas' (member).

4.2 Social Capital

All four dimensions of Social Capital played a role. Most of the originally formulated indicators are found in the interview reports. Six new indicators emerged from the data (in *italics*), one structural, one relational and four of the action dimension.

The composition of multi-disciplinary groups appeared to be an important condition for knowledge gathering. The unique connection between relevant interest groups of two professional sectors and government, for the first time ever, ensured a firm basis for collaboration. A problem was caused by the discontinued participation of members during all phases of the project. The changes required 'telling the story over and over again' and caused loss of group-knowledge, a chairman told.

Good team relationships appeared fruitful. These referred to appreciation, trust, motivation and sympathy. Getting to know each other at each 'level', - board, management, and groups - proved important for a good understanding. Also collaboration between different partners (education, health care, and government) was positively assessed. A common goal had to be created, accepted by all.

On that basis the participants were willing to share their knowledge. A conducive factor was the capability to understand each other's professional jargon, intention, and sense behind ideas and proposals, since the participants came from different disciplines and organizations. A further factor impacting on the innovation process and its outcomes was the availability of the right subject-matter expertise and the search for the missing one. The creativity to adapt this information to the problem to invent new solutions, differed a lot between the members. It was the collective possession of this expertise that brought the solution of the innovation tasks.

The necessary actions to reach innovation outcomes required decisiveness, courage and excellent communication skills. This appeared to be important at all levels. For instance, programme managers had to perform usual management tasks, but also to behave as part of the programme. Interviewees told that group members and chairmen needed to 'network' inside and outside the group: to link between the project group and the home organizations; to bridge between different organizations and interests; to bond colleagues within the innovation group. Chairmen mentioned that implementation capabilities, in the right style to the right persons, were important.

Two groups experienced the downside of these processes. They found it difficult to achieve progress, and collaboration felt negative. 'There was a lack of decision mak-

ing, no or little work planning, the wrong combination of people in the group, a vague target, the absence of a common culture, and ineffective communication within and outside the programme'. All reasons for struggling.

The lack of experience of participants, the complexity and large number of organizations involved, did not make the innovation process easy. For most members and chairmen all this was new, and many of them found their task a truly radical innovation of personal capabilities.

4.3 Process of knowledge productivity

The findings of this study confirm the twofold process of knowledge productivity: improvement or innovation, and increasing personal ability. Next to indicators reported in previous studies (De Jong, 2010) five new indicators were found in the data (indicators stated in Table 3 in *italics*).

The process of knowledge productivity was *'a long step by step process that took more time than foreseen'* (chairman). The group members needed to learn to know each other's qualities. Later on it proved important to *'let go of old views and own ideas in order to collectively reach something new'*, as a group member stated. The participating organizations had to give up their institutional autonomy and to delegate decision power to the project groups.

The knowledge productivity process implied close collaboration, courage, creativity and perseverance. Group members found it positive that most activities were closely connected with their regular tasks, *'that is stimulating because you possess the necessary expertise'*. External pressure also had a positive impact: *'you have to work towards the deadline without delay'* (group member).

Four of six groups generated new knowledge and succeeded more or less easily in developing the new products. The other two groups did not, since their tasks appeared to be too challenging. It lacked a close connection to their daily work and involved a structural change that was above their competence. Apparently this cluster of circumstances was not favorable.

Not everything was achieved as planned and some adaptations were necessary: *'That is all in the game, when you are innovating at such a big scale'*. 'But most members were proud and satisfied with the innovations achieved', a chairman concluded. *'It is not realistic to expect one can achieve all the broad goals of such a huge programme with so many stakeholders. It takes years before the existing institutions give up some of their authority'*.

The interviews further showed that working together with enthusiasm and with pleasure, searching inside and outside the project group for solutions, stimulated the energy. The interviewees mentioned too that the project increased their innovation abilities. Interviewees gave examples such as: *'I acquired expertise in a new and problematic field'* and *'realized that innovation cannot be anticipated beforehand'*.

4.4 Products of knowledge productivity

The present study demonstrates the twofold outcomes of innovation processes: organizational innovation and newly acquired abilities to innovate.

Creating a new Academy as inter-organizational construct, was the ultimate goal of this project and was certainly reached. The unique programme concept - the establishment of a network between education, health care and government-, had been copied successfully by other programmes, while some products were sold. Many new concrete products have been created that could not have been achieved by each organization or professional on its own. Besides these results, the interviews showed new products of a relational nature, such as collective creativity, joint vision and feelings of pride, recognition, motivation and inspiration. The jointly developed vision on problems and solutions, the unique innovation concept and the network for continued collaboration, can be considered as realized products too.

Project group members found the exchange of knowledge and the collective creativity a result in itself. As a group member expressed *'success is not only realizing the planned goals in time, it is much more'*.

Not only cognitive, but also emotional and relational results were mentioned. Group members added that *'trust and positive relations have grown'*. They also shared the insight that innovating is fun. *'It is creating something that does not exist yet, by joint efforts'*. Some stated that *'not only the individual members had learned to innovate, but also institutions'*.

All interviewees experienced a growth of their personal competences, the programme managers included. Interviews showed that participants learned about both specific content and about innovation processes: they found solutions for problems, learned to discern relevant information, to ask for and exchange knowledge, to combine it and adapt it to the problem, to transfer solutions to the organizations, to look for the right implementation strategy and take care of follow-up. *'This happened without well-defined schedules, by trial and error, using each other's knowledge and creativity'* as a chairman told.

5 Conclusions and Discussion

This case study of a large inter-organizational innovation programme was conducted in order to gain insight into the conditions, process and products of innovation, which we described in terms of knowledge productivity and Social Capital.

The case validates the conceptual framework we presented in the first part of this article. The four dimensions of Social Capital, embedded in external conditions, obviously influence the process and the products of knowledge productivity. In the findings we presented examples of how these factors play a role in knowledge productivity, stimulate innovation processes, and enhance the abilities of the innovators. The case provided further elaboration of our framework: the findings added 18 new indicators that can be incorporated into the framework. In the following section, we present conclusions for each research question.

1. *Which knowledge productive activities lead to improvement or innovation for the organization?*

The interview findings showed that eight knowledge-productive activities can be discerned as success factors of an innovation group. They are summarized in Table 4.

Table 4. Eight steps to sustainable knowledge productivity

Knowledge-Productive Process	Activity	Social Capital dimension
1 Invite motivated and experienced colleagues and (let them) choose a leader	link and bridge	structural relational
2 Understand and accept collectively the task and its feasibility	analyse and communicate	cognitive relational
3 Trace together step by step the suitable and required information, the explicit and tacit knowledge, and skills within and outside the group	trace and gather	cognitive relational
4 Design organically a task path with the group members, to create the new product, process or service	plan together	cognitive relational
5 Use newly-gathered information to develop new knowledge and abilities	learn and develop	cognitive
6 Apply this knowledge and abilities in the creation of the new product, process or service	co-design co-create	cognitive active
7 Stay constantly in contact with all levels of the organization involved, including the board	communicate	relational active
8 Cooperate with the users, by implementing the new product, process or service.	co- implement	relational active

Activities 3, 5 and 6 are similar to the description of knowledge productivity by Kessels (2001) – tracing, using and applying information – which were originally mainly described in a cognitive sense. We added the ‘social’ element, while the present study demonstrates more dimensions of these knowledge activities. This is also the case for processes 1, 7 and 8, which presume a special quality of the structural, relational and active dimensions, such as good collaboration with a) professionals inside and outside the group, and b) future users, grant-givers, stakeholders and responsible leaders (structural and relational dimensions). The findings showed that knowledge productivity emerges in a supportive environment nurtured by sympathy, pleasure, and perseverance. It is based on an attitude of trust, open-mindedness, a border-crossing mentality and courage to develop new artefacts, tact and sensitivity. Intrinsic motivation, personal involvement and creativity are the stimuli (relational). These eight steps can be used as design principles for HRD guidance or as a self-directed HRD tool by an innovation group (Poell, 2012b).

This case demonstrates that each project group creates its own ideas about new products, processes and services, depending on the knowledge, vision and abilities of the group members. This collectiveness is the source of innovation processes and at the same time defines its limits. Sustainability depends on the acceptance of the results by the participants at all levels and the way the innovation is rooted in the work environment of the innovators. Innovation is a product of the experts themselves and has to be owned by them to be sustainable.

2. Which knowledge-productive activities lead to new capabilities among the professionals?

The data revealed that different sets of activities have an impact on specific abilities. Activities 2, 4, 5 and 6 (Table 4) result in new cognitive abilities of the innovators. This occurs when innovators see evidence of new knowledge, skills, and attitudes from each other (Boshuizen and Van de Wiel, 2014). Learning of knowledge, skills and attitudes results in the improvement of existing capabilities. It is learning by doing at the workplace (Marsick and Watkins, 2001; Field, 2005) that paves the way for knowledge productivity, such as tracing relevant information, using this information to develop new abilities and applying these abilities to improving, innovating and acting effectively in new situations (Kessels, 2001). However, processes 1, 3, 7 and 8 contribute together to the development of relational and emotional attitudes, such as an open mind, creativity and courage. The participants in this project stated that they learned most from these experiences if they were connected with their present tasks. Most participants were delighted to learn new things.

Most group chairmen were professionals with experience in previous innovation projects. This may indicate that earlier experience leads to sustainable and transferable expertise. This finding may present an interesting question for a further longitudinal study.

3. Which dimensions of Social Capital stimulate these knowledge-productive processes?

We found that all four dimensions of Social Capital contribute to knowledge productivity. This knowledge productivity requires enough expertise to explore each other's explicit and tacit knowledge and to accept unusual ideas and plans. It requires letting go of old ideas and building new realities together. The external knowledge has to be accepted and connected to knowledge and capabilities of professionals in the organization (cognitive). The concrete innovation process cannot be planned beforehand. Of course the policy framework, values, goals, and targets have to be clear in advance, but the outcomes come from the 'capital' in and outside the innovation group. This organic process of co-creation deserves time and facilities. Also, it deserves pace to finalize in time (action).

The relational and cognitive dimensions seem to be the most important qualitative conditions for innovation, although only suitable actions transform this quality into productivity. And in turn relational and cognitive quality depends on the structure of the group.

In short, every dimension needs to have sufficient quality. This means:

- A structure creating a facilitating environment, support at all levels, autonomy and authority;
- Relationships based not on position, function or task description, but on motivation and commitment to a common goal, on trust and on pleasure;
- A good understanding of each other's language and knowledge, suitable subject-matter expertise to share and innovation ability;
- The courage and capability to act: developing a team, networking, communicating with all levels involved, and tactfully co-creating.

4. Which external conditions stimulate Social Capital and knowledge productivity?

The conditions proved to be the existence of: an urgent problem (also found by De Jong, 2010), a smart task, managerial support and autonomy. In particular the support of policy-makers is important for the sustainability of results. In other words, not an atmosphere of command and control, but stimulating commitment and real

acceptance. This extends to the phase after the programme has ended, even if the new products, processes and services have not been designed according to the programme plans. For this inter-organizational programme this condition includes giving up one's own organizational autonomy, sharing responsibility and developing new networks for further collaboration between the organizations. It is important to strike a balance between the separate and the common interests of the organizations.

In general, this study underlines that the 'social' is the 'capital'. The quality of the connections is the basis and the power for knowledge productivity and innovation. Our case demonstrates that the creation of new knowledge products was possible only on the basis of inter-organizational Social Capital. The newly-acquired cognitive and relational abilities of the innovating professionals are promising for sustainable results.

5.1 Implications for HRD practice and policy: Social Capital as an HRD target

The results have implications for HRD that go far beyond the Dutch context. Managers, chairmen and members of innovation groups should regard an innovation as an organic process of professionals with valuable resources that deserves support and care. A programme with strict goals, deadlines, and external command and control does not provide a rich and safe working climate, which is necessary for innovation. Acceptance of the innovation target by the professionals involved is essential. Without pleasure and pride there is not enough drive to invest the best they have. Ownership of the problem, of the method and of the destination appears necessary.

Therefore it is an HRD task to support innovation projects by *targeting Social Capital*: not just by planned interventions, but by 'being present' (Baart, 2004) as supporter, coach and mediator. Not only the HRD professional, but all innovators should be able to perform HRD activities and in this way change HRD into a tool of employees (Poell, 2012b). This implies that employees need to develop skills and tools to act like HRD agents, as a second level of professionalism.

Another implication of this study for HRD could be to apply 'action research' as a change intervention. Interviews, as used in this study, appear to be influencing instruments that provide professionals with insight into their actions and make them proud of their work. In addition, it provides managers with useful inside information with which to improve the innovation process. In this respect, scientific research can make an important contribution to professional practice.

5.2 Limitations and future directions

It is fair to draw attention to some limitations of the study. Although this inter-organizational programme consisted of nine organizations in three different economic sectors, only one case study was conducted. The programme was selected as best innovation programme in Europe in 2012 and 2013, pointing to the excellence of the innovation concept. Perhaps this fact and the urgency of the regional problems faced by the programme colored the positive innovation context. Further research is required to test the findings in other settings.

The interviewers had different levels of expertise in performing interviews. This caused some differences in the level of detail of the interviews. Also, the random selection of interviewees caused some differences in the extent of the information provided. Some had huge experience and had been involved from the beginning, whereas others had just started without any knowledge about the programme and its goals. This affected their views on the process of innovation.

The innovation groups had a range of different tasks, and varied in terms of composition and quality of members and chairmen. This condition influenced the concrete working processes and was reason for not drawing conclusions about differences between the project groups. Nevertheless, data showed a similar pattern of Social Capital and knowledge productivity, within both the successful and the less successful groups. The conclusions could possibly have been more rigorous if data gathering had included observations as well.

We recommend future researchers to combine interviews with observations, to be able to acquire deeper insight into details of these processes. Furthermore interviews might be repeated after some time to extract information about the sustainability of the innovation. Finally, the role of the group chairman deserves more attention. Our data shows considerable influence on the process of knowledge productivity, in particular the atmosphere, efficiency and effectiveness, as De Jong (2010) also finds.

This study has contributed to a better understanding of factors influencing sustainability of knowledge productivity within organizations. The empirical findings have played a role in untangling the concept of knowledge productivity and in discovering HRD interventions to enhance knowledge productivity in organizations from the perspective of Social Capital. Further research on the role of HRD for sustainable organizational innovation is welcome.

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The Co-Creation-Wheel: Twelve Mechanisms to Enhance Collaborative Innovation and to Engage Professionals

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Abstract

This article reports on a validation study of the 'Co-Creation-Wheel', a model on success factors for co-creation in innovation teams. The model is validated by fourteen experts, scholars and practitioners, in fields of innovation, consultancy and research, using semi-structured interviews and a questionnaire, which focused on the importance of dimensions and mechanisms of the 'Co-Creation-Wheel' as well as on the role and activities of actors in innovation practices. The 'Co-Creation-Wheel' is a comprehensive model that demonstrates multiple dimensions and factors of co-creation. It adds new elements to existing models.

Findings support the importance of twelve mechanisms within four dimensions of the 'Wheel' for sustainable innovation. The 'relation-emotion' and 'action' related mechanisms influence sustainability, while the 'construction' and 'expertise' related mechanisms influence the quality. Co-creation can be stimulated by shared leadership and supporting, flexible HRD-activities. The model is suitable as reflection instrument for practitioners and as intervention instrument for HRD-professionals in innovation practices.

1 Introduction

In order to create added value, today's organizations need to respond to the technological and social changes in order to stay ahead of the global competition. In this process of constant innovation human resources are a factor of utmost importance. More and more, innovations require multidisciplinary and even inter-organizational approaches, as single organizations often do not have the resources and employees to face these challenging and complex innovations. This does not only apply to businesses but is also a reality that many universities are facing in so called industry-school-partnerships or regional alliances. These are often stimulated by governments in the framework of an international plan, such as the European development programme 'Europe 2020' (Commissie, 2010). General goals of such university-business networks are mostly twofold: to create solutions for practical, production or societal problems, and to design adequate educational programmes for the future workforce (Flynn and Pillay, 2013). Achieving those goals is a challenge for professionals in the innovation networks, since they need to collaborate with others outside their familiar domain, with other values, jargon and different perspectives.

In search for theoretical concepts that support our understanding of innovations in which different organizations are collaborating, co-creation has become one of the promising answers. Although the term is mostly used in the business domain (Sanders and Stappers, 2008), recently the concept appears also in the management and educational field. Co-creation can be regarded as a collective process where people or organizations together generate and develop new products, processes or services (Ind and Coates, 2013). Compared to, for example, the concept of Social Capital or the concept of knowledge productivity, the advantages of the concept co-creation lie in the combination of collectivity and creativity, linking Social Capital with knowledge productivity.

Though the concept of co-creation has made substantial progress on a theoretical level, mainly strategical and managerial elements in business production processes have been elaborated (Sanders and Stappers, 2008). The social dynamics of the processes within co-creation networks appears to be an under-developed area, as was discussed several times by scholars at recent international conferences (SDIN, Heerlen, May 2014; UFHRD, Edinburgh, June 2014; PI, Genk, June 2014; IHRM, Cracow, June 2014). In particular, the presence of supportive conditions, required competences and the contribution of HRM/D to innovative co-creation, appear to be topics that need further elaboration (Boon, Van der Klink & Janssen, 2013; De Cieri, 2014)

This article investigates these topics. Based on outcomes of two previous empirical studies on two substantial business-university collaborations (Authors, 2013; 2014), and supported by findings of the literature study, the present study hypothesizes on the dimensions and mechanisms of co-creation, by presenting and validating the Co-Creation-Wheel, a model of success factors in co-creation practices (see Figure 1). Also the role of HRD in innovation practices will be discussed.

2 Literature Study

The three sections of this literature study concern phenomena of ‘co-creation’, aspects of the co-creation process, and gaps in research on co-creation. These gaps support the rationale for this study on mechanisms of co-creation and its consequences for HRD.

2.1 Phenomena of co-creation

Development of the concept

Current research provides a multitude of approaches to co-creation, and has resulted in a complex milieu of definitions, perspectives, and interpretations. Despite its affiliation with the business domain, co-creation is a very broad concept with applications ranging from the physical to the metaphysical and from the material to the spiritual, as demonstrated by Ind and Coates (2013). It stems from the 1970s, a period when people were given influence in roles where they showed expertise, and participated in the ideating of activities (Sanders and Stappers, 2008).

Since that period, different views have been developed in business domain, in arts and design, and in social sciences. The *participatory view* which emerged in the 1970s—a Scandinavian approach in arts and design science—emphasizes the involvement of people who are going to use products. The *democratising view*, first prevalent in the social sciences during the 1990s, connects co-creation to social innovation in areas such as government (Ind and Coates, 2013), public services (Ramaswamy and Gouillart, 2010), healthcare and education (Leadbeater, 2008). The *customer-firm view* in the business domain, which emerged in the 2000s, has led to a change from user-oriented to user-centered production, and from thinking in products to thinking in services. The work of Prahalad and Ramaswamy (2000) can be regarded as the most influential publications on co-creation having received worldwide attention by practitioners and researchers in business. Essentially, their con-

cept of co-creation emphasises a substantial change in the way new products are developed involving a joint activity by businesses and customers. More recently, Ramaswamy (2014) claimed that co-creation is not just a concept but is a new paradigm that proposes a truly substantial shift in how to consider innovation in organizations and society.

Definition

Practice and discussion today take on different manifestations, depending upon the expertise and mind-set of its practitioners and the field where it takes place. Most definitions of business are connected with production, marketing or logistics (see for example Das and Teng, 2002). In other fields broader definitions are proposed, which express the general processes of collaboration and creativity between people with the purpose of value creation (see, for example, Amabile, 1996, Sanders and Stappers, 2008). Main elements of creativity are novelty and usefulness, while innovation can be defined as the implementation or exploitation of creative ideas (Amabile, 1996).

Ind and Coates (2013) emphasize participative processes in which people and organizations together generate and develop meaning. They see co-creation as a shift in thinking from the industrial age mind-set to the human engagement mind-set. The authors of this article adhere to this description and define co-creation as 'a participative process in which people or/and organizations in equivalent dialogue, together generate and develop new valuable products, processes or services'.

Creativity = the ability to design ideas or concepts
Innovation = a social process in a context to implement a solution

Concept

Value co-creation, or shortly 'co-creation', emphasizes the interaction of individual, social and organizational characteristics, which is described as a dialogue (Van de Ven and Rogers, 1988; Woodman, Sawyer and Griffin, 1993). In fact the concept exists of three elements: value - co - creation (Saarijärvi, Kannan, and Kuusela, 2013). 'Value' specifies what kind of value and for whom; 'co' specifies by what kind of actors; 'creation' specifies through what kind of mechanisms. This, in combination

with the spontaneous character of creativity, shifts co-creation away from a rational approach to one that is more organic.

Co-creation seems to be a combination of two other concepts, namely Social Capital and knowledge productivity. Social Capital, the quality of the social relations, specifies the 'co' element of co-creation, the actors and the resources, while knowledge productivity, the process of gathering new knowledge to create new products, processes and services (Kessels,1995), specifies the 'creation' and the new 'value'.

2.2 Aspects of the co-creation process

Actors and creativity

The process and product of collective actions depend on the potential qualities of the people gathered in a co-creation environment, often a network or group, to collaborate and create new solutions for a situation or problem. Apart from the qualities to work together in a positive and stimulating manner, the creativity of the people gathered is an important quality. In this paper creativity refers to cognitive creativity to add new value to existing situations. Some scientists state that creativity is a personal quality, others point at the influence of a situation or motivation, and emphasize the collective roots of a creative thought or idea.

Ind and Coates (2013) make three countervailing points to the idea of personal inherent creativity. Firstly, innovative ideas tend to be developed by groups working together (Isaksen, 2010; Johnson, 2010; Sawyer, 2008). This makes the point that rather than focusing on how to spot individual creativity, HRD professionals or practitioners should concentrate on how to make groups productive by creating an atmosphere where people trust each other and the organization. Secondly, there is a requirement in creative processes both for the inspiration of original ideas and the application of detailed creativity to work them out (Kirton, 1984). Thirdly, Amabile (1997) suggests as components for creativity creative thinking skills, expertise and motivation. This is supported by Füller (2010), who observed that intrinsically interested consumers are highly motivated and are more knowledgeable and creative than other persons.

So rather than looking for inherent creativity, it can be argued that creativity is a result of engagement and group knowledge. The implication of these three points is, as not only Ind and Coates state (2013), but also Isaksen and Treffinger (at the PI-conference Genk, 2014) that everyone has the potential to contribute to creative

processes, if they are motivated to do so and if stimulating conditions and processes exist.

Stimulating mechanisms

As a stimulating environment, next to motivation and the possession of creative thinking skills, is an important condition for co-creation, which mechanisms then play a role? Literature suggests some aspects. The idea of “serious play” is seen as an important component in creative processes (Kelley, 2001; Statler, Roos and Victor, 2002; Jones, 1995) because it provides the freedom to do things differently on each occasion. Stimulating is to be encouraged for exploring and sharing, having the opportunity to experiment with ideas without ‘demand and control’. Enough time and space for creation provide possibilities in which ideas can be realised, because the process generates an answer, recognizing that many other answers would have been possible in a different process and with different participants (De Landa, 2002). Loewenberger (2013) presents 16 factors which support creativity and innovation, based on the work of two influential scholars, Amabile (1996) and Isaksen (1999, 2007). Enhancing factors are, according to Amabile, autonomy, organizational and supervisory encouragement, sufficient resources and work group support, while Isaksen mentions trust, play, challenge, idea time, debate and risk taking.

When these threads come together, it can be supposed that ‘the ‘Co-Creation-Wheel’ will spin’ and individuals, on different organizational levels, will co-create.

2.3 Research on co-creation

Echoing Shalley, Zhou and Oldham’s (2004) claim, Loewenberger argues that there is a ‘need for empirical investigations of dynamic interactions between personal and contextual characteristics and among the different contextual characteristics’, and regrets that ‘evidence of research at multiple levels of analysis, adopting a more systematic approach on the main components of the interactionists perspectives, is lacking’ (Loewenberger, 2013, p.427).

This gap in the co-creation knowledge base has been highlighted recently by Anderson (2014), Rutten (2014), Von Stamm (2014), and De Cieri (2014). Furthermore, several empirical studies related to co-creation have been reported recently at various conferences. These include a longitudinal study of an innovation project in Thailand by Na Chiangmai (2014); a qualitative study on proximity in collaboration in The Netherlands by Werker, Ooms and Caniels (2014); and a study on multilevel aspects of innovation by Stanley (2014) in Australia. In addition, in the Netherlands studies

have been conducted by De Jong (2010), Verdonschot (2011), and Castelijns, Vermeulen and Kools (2013), exploring the mechanisms of collaborative innovation processes in teams. These Dutch empirical studies, as well as a literature review by Du Chatenier, Verstegen, Biemans, et al. (2009), on 'knowledge creation within collaborative teams', suggest that a number of factors play a role in innovation practices in knowledge organizations. The authors of this article have built on these latter findings, and have broadened the scope of empirical research with two large-scale longitudinal studies on processes of co-creation between organizations, using Social Capital as focus (see Authors, 2012). They identified the effects of four dimensions and 18 factors of Social Capital on co-creation (Authors, 2012, 2014). The present study builds upon this research.

Under-researched role of HRD in co-creation practices

Co-creation is a process that takes place at the micro (person), meso (group) and macro (organizational) level within and between organizations. HR should play a role at all three levels (Loewenberger, 2013), and adopt a holistic approach in order to support and lead the creative revolutions at the 21st century workforce and workplace, as claimed by Gibb and Waight (2005). Also Garavan (2007) argues that Strategic HR should be recognised as a crucial factor in supporting effective organizational change. Its role can be relevant in supporting desired individual knowledge, skills and abilities, to support group skills and to sustain a positive organizational environment. Loewenberger (2013) mentions three problems in stimulating innovative behaviour in organizations: the lack of understanding what it means to be creative and innovative (Isaksen and Ekvall, 2010)', the lack of training of workers and managers in creative thinking skills (Proctor, 2013), and social and organizational barriers that have to be overcome (Amabile, 1997; Storey, 2000). So, as suggested by Woodman et al. and McLean (2005), and more recently claimed by Loewenberger (2013, pg. 428), the goal of HR within the context of co-creation is 'to develop capability and commitment to stimulate, support and sustain creativity and innovation at multiple levels of the organizational system'.

Some research on the role of HR in innovation has recently been done, including the literature study of Loewenberger (2013) as well as conceptual and empirical studies (see Ehlen et al., 2014; Park, Song, Yoon et al., 2014). However, as stated by Sheehan, Garavan and Carbery (2014), the role of HRD in co-creation practices is under-researched, the theory is still fragile, and empirical evidence is scarce.

3 Purpose of the Study

This study aims to contribute to the further theoretical underpinning of the concept and practices of co-creation and the consequences for HRD. Firstly, we add to the gap in the co-creation knowledge base with evidence for activities of different actors at multiple levels of co-creation, hereby adopting a systemic approach. Secondly we add to the theory on co-creation and HRD/HRM. To these purposes our aim has been firstly to create a 'hypothesized conceptual model' that captures all of the 'dimensions' and the main 'factors (mechanisms)' identified by the Authors (2012, 2014) empirical studies, incorporating also the additional insights gained from the literature review presented in this paper. Secondly to validate the so hypothesized 'Co-Creation-Wheel' (Figure 1) by testing it against empirical evidence gathered from a sample of 'experts' who have engaged in inter-organizational 'co-creation of innovation', mainly within 'university-business' collaborate partnership within The Netherlands. Thirdly, to generate a 'validated conceptual model', namely the revised 'Co-Creation-Wheel' that has emerged from the testing of the hypothesized model, and at last to demonstrate the efficacy of the so generated 'Co-Creation-Wheel'.

To reach the aims the study is guided by four *research questions*:

1. Which mechanisms and dimensions of the 'Co-Creation-Wheel' do the experts discern as important?
2. Which interdependency between the mechanisms and dimensions can be discerned?
3. Which actors and activities are important in co-creation processes?
4. What is the value of the 'Co-Creation-Wheel' for practice and future research?

4 Research Model

Next to providing a systematic graphical representation of mechanisms, described as factors and dimensions, the 'Co-Creation-Wheel' is meant to serve as a reflection and intervention instrument for practitioners and HRD professionals in innovation practices. For that reason, the model is simple and transparent, and uses an acronym: 'CREA', formed by the capitals of the dimensions '*C-onstruction*', the structural dimension, '*R-elation-emotion*' the relation - emotion dimension, '*E-xpertise*' the cognitive dimension, and '*A-ction*' the action dimension.



Figure 1. The 'Co-Creation-Wheel' (Ehlen, Van der Klink, Boshuizen, 2014)

Urgency = the starting point for co-creation

C - onstruction = the structure of the innovation practise

R - elation - emotion = the relation – emotion dimension mainly in the team

E - xpertise = the cognitive dimension mainly in the team

A - ction = the design and implementation activities in the innovation practise

Each dimension is specified with three mechanisms.

1. *Construction*

Mechanisms of this dimension are: autonomy, facilities and support. They have to be constructed to an inviting and powerful innovation environment.

Autonomy

- work according individual passion and motivation
- freedom to experiment
- to be owner of the method
- to be owner of the results

Facilities

- enough time
- enough finance, material and ICT
- suitable work conditions

Support

- support of the management
- support of colleagues
- support of future clients

2. Relation - Emotion

Mechanisms of this dimension are: trust, team-spirit and good atmosphere. These are conditions for an inspiring and safe innovation team.

Trust

- based on integrity between co-innovators
- between management and innovators
- confidence in the feasibility of the task

Team spirit

- connectivity
- individual interest is subordinate to team goal
- co-operative leadership

Good atmosphere

- fun to be together
- pleasure
- relaxed work atmosphere

3. Expertise

Mechanisms of this dimension are: shared goals, subject matter expertise and innovative capability.

Shared goals

- agreement about goals,
- between stakeholders and innovators,

- between all organizational levels
- shared values

Subject matter expertise

- the right expertise and skills for the job
- multi-disciplinary diversity
- a combination of different viewpoints

Innovation capability

- ability to create new combinations of knowledge
- ability to design
- ability to think in a user-oriented way

4. Action

Mechanisms of this dimension are: collaboration, communication, courage and decisiveness to act.

Collaboration

- between innovators and initiator/grant-giver
- between innovators and internal and external networks
- between innovators and future users

Communication

- transparent communication with internal stakeholders
- transparent communication with external stakeholders
- constructive communication in the innovation team

Courage and decisiveness to act

- focus on results
- be boundary crossing
- dare to take unusual decisions

5 Method

5.1 Design and sampling

The design of the study is a mixed methods research among 14 experts to validate the model of the 'Co-Creation-Wheel'. Seven scholars and seven practitioners, all experts on co-creation practices, were selected. Areas that were considered relevant for selection concerned educational innovation, organizational change, collaborative learning, and industrial co-creation. The 14 experts represented a good mix of age and experience. Twelve different organizations were involved, including univer-

sities, institutions for vocational training, consultancies and firms in the tourism and health sector. The positions varied from professor, or HR manager to bakery teacher in lower vocational education. The practitioners had positions such as programme manager (P5), team leader (P3,4), team member (P1,2) and consultant (P6,7). Two practitioners also performed practice-oriented research, and five scholars were also consultant in innovation settings in educational and industrial field.

5.2 Instruments and procedure

Two instruments are used, a questionnaire, which focused at research question 1 and 3, and a semi-structured interview to gather data at research question 1 to 4.

The questionnaire consisted of 24 4-point Likert questions on the importance and interdependence of dimensions and mechanisms and on activities of the actors. In two open-ended questions respondents could indicate factors that were missing in the 'Co-Creation-Wheel'.

The interview guideline for the two groups of experts differed slightly. For practice experts it consisted of information about purpose and background of the study and of 16 questions on: 1. recognition, importance, clarity, confirmation, relevance, completion, interdependence of the dimensions and mechanisms; 2. the possibly stimulating role and activities of actors; 3. the necessity of an urgency; 4. the relevance of the model for practice. For the scholars also questions concerning comparison with other scientific models and theories on co-creation, and concerning the relevance of the 'Co-Creation-Wheel' for science. All received a colored illustration of the 'Co-Creation-Wheel' with an extended description of the terms used.

During the interview the experts were invited to take up the role of a critical friend (Costa and Kallick,1993) with the aim of broadening the researchers' view. They could, for instance, ask provocative questions, provide a different perspective and critique the work.

5.3 Data collection

Data collection took place in December 2013 and January 2014. Nine of the 14 experts were interviewed face-to-face and five by phone, depending on their time and logistical possibilities. As preparation for the interview, the experts received the interview guideline and illustration. One interviewer (CE) conducted the 14 interviews, which lasted between 1 and 1.5 hours each. During the interviews an open atmosphere was created, in which expert and interviewer exchanged information

and opinions about the subject. Each interview was audio recorded and the transcript was mailed to interviewee for validation.

The questionnaire was sent by mail to the participants, or handed over to them when they were interviewed. The questionnaire was filled in on the spot or returned by e-mail to the researcher. At two meetings, one with practitioners, July 2013, one with scholars, June 2014, the model was discussed as a member check.

5.4 Data analysis

From the quantitative questionnaire data, the mean, standard deviation and rank order, per mechanism and dimension, were calculated, both individually and per category of experts. These findings were completed with the results of the interview reports.

The qualitative data, collected during the interviews and the open questions in the questionnaire, were analyzed using a qualitative content analysis (Miles and Huberman, 1994). The units of analysis were the mechanisms and dimensions of the 'Co-Creation-Wheel': the constituting concepts, the relations between them, their expected function, the realization or influencing of them by actors and activities, and the role of HR.

To reduce the amount of qualitative data in the interview reports, a procedure of seven iterative steps was carried out:

- 1 The four dimensions and 12 mechanisms of the Wheel (Figure 1), extended with the items urgency, actors, activities, and an outer circle, served as a category system for deductive ordering and analysis of the data.
- 2 The 14 interview reports, combined with data from the open questions of the questionnaire, were arranged in two groups – practice experts and scholars – and coded P 1-7 and S 1-7.
- 3 Each report was analyzed, based on the category system.
- 4 Fragments of agreement and disagreement were brought together in an overview per mechanism, dimension, and actor.
- 5 The overview was synthesized per group of experts, with the objective of gaining a complete picture of dimensions, mechanisms, and actors.
- 6 The results per group were compared with each other and were compared with the results of the questionnaire.
- 7 Finally the findings were summarized to respond to the four research questions.

5.5 Validity and reliability issues

The combination of the interview with a questionnaire strengthened and completed the data and made the findings about the model more solid. Another advantage appeared to be the preparation by the interviewees on the basis of the instruments they received in advance.

Besides, extra support of the findings was offered by comments on the model at the two meetings with practitioners and researchers. The comment of both groups was comparable with the scores and feedback of the 14 experts.

6 Results

This chapter presents the answers of the experts on the questionnaire and the interviews.

1. Which mechanisms and dimensions of the 'Co-Creation-Wheel' do the experts discern as important?

By filling out the questionnaire, the experts indicated the importance of the mechanisms and dimensions of the 'Co-Creation-Wheel'. In Table 1, the rank order, mean and standard deviation of the findings are presented.

The 14 experts together evaluated all items and dimensions as important ($M > 3$). This suggests that the 'Co-Creation-Wheel', with its four quadrants and twelve mechanisms, is a valid model of important mechanisms of co-creation.

In general the scholars scored somewhat lower than the practitioners. Both groups of experts found the Action dimension to be very important. (Rank 1, $M=3.57$, $SD=0.5$). Of these '*courage-and-decisiveness*' was appreciated most ($M=3.71$, $SD=0.49$) by the practitioners, and '*communication*' ($M=3.71$, $SD=0.49$) by the scholars. Surprisingly, scholars placed a relatively low valuation on the Expertise mechanism '*subject matter expertise*' ($M=2.86$, $SD=0.69$) which is the only item found not to be important by them. Also '*good atmosphere*' ($M=3.00$, $SD=1.15$) was found not important by most scholars, practitioners valued it more highly ($M=3.43$, $SD=0.53$).

Table 1. Rank order of dimensions and mechanisms of the 'Co-Creation-Wheel'

	Mean Practitioners <i>n</i> =7	Mean Scholars <i>n</i> =7	Total Mean <i>n</i> =14	Rank total group
Construction				
1 autonomy	3.43 (0.53)	3.43 (0.79)	3.43 (0.65)	5.5
2 facilities	3.14 (0.69)	3.14 (0.69)	3.14 (0.67)	11
3 support	3.43 (0.53)	3.14 (0.69)	3.29 (0.62)	8
Total	3.33 (0.58)	3.24 (0.70)	3.29 (0.64)	3
Relation - emotion				
4 good atmosphere	3.43 (0.53)	3.00 (1.15)	3.00 (0.89)	9.5
5 teamspirit	3.57 (0.53)	3.57 (0.76)	3.29 (0.65)	5.5
6 trust	3.43 (0.53)	3.43 (0.79)	3.43 (0.65)	5.5
Total	3.48 (0.51)	3.24 (0.89)	3.36 (0.73)	2
Expertise				
7 shared goals	3.14 (0.69)	3.29 (0.76)	3.21 (0.70)	9.5
8 subject matter expertise	3.14 (0.69)	2.86 (0.69)	3.00 (0.68)	12
9 innovation capability	3.57 (0.53)	3.29 (0.76)	3.43 (0.65)	5.5
Total	3.29 (0.64)	3.14 (0.73)	3.21 (0.68)	4
Action				
10 collaboration	3.43 (0.53)	3.57 (0.53)	3.50 (0.52)	3
11 communication	3.57 (0.53)	3.71 (0.49)	3.64 (0.50)	1
12 courage and decisiveness	3.71 (0.49)	3.43 (0.53)	3.57 (0.51)	2
Total	3.57 (0.51)	3.57 (0.51)	3.57 (0.50)	1

2. Which interdependency between the mechanisms and dimensions can be discerned?

Construction

For most of the experts the Construction-dimension seemed the logical start of an innovation trajectory. Especially a divers and multi-disciplinary composition was found necessary (P1, 3), as well as the presence of the young generation (P1). Three experts emphasized that the personal drive of a pioneer or colleague, could be sufficient to start with co-creation: "Start with people with passion, then the rest will follow" (P7). Being *allowed to act autonomously* without hierarchical control, individual drive (S4) and vision (P5) was found important. Also to search for a dynamic balance, because "personal autonomy can conflict with team autonomy" (S6). The second and third mechanisms, *good facilities* and *support of managers and col-*

leagues, are found crucial too. Shared responsibility (P7) has to be the basis, but, “If facilities or support are not given by managers, you have to fight for it” (P3).

Relation - Emotion

Almost all experts emphasized trusting relations: “Trust is necessary between initiator and innovators” (S1), “within the team and between teams, in the management and in possibilities of the organization” (S4). But, “also distrust can lead to breakthroughs, friction brings shine and heat” (P1).

Team spirit was found important too, “the feeling that “1+1=3” (P4), “clear expectations (S1) understanding and appreciation (P3, S7), openness and tolerance” (P3, P6) are found elements of a good team spirit. “It arises out of individual and common interests” (P5), “reciprocal dependence and attractiveness are critical factors” (S4). But team spirit is vulnerable, “it can disappear suddenly by negative incidents” (S3).

The third mechanism, *good atmosphere*, is found important for learning and innovating. “Working together mostly creates pleasure” (S3). But “what it is exactly depends on the persons involved. Scholars’ way of having fun is different from that of shop workers” (P3). Two experts made critical remarks on this mechanism: “Pleasure has to be connected with the common goal to be fruitful” (S6), and “A too cozy atmosphere can be counterproductive” (P4).

Expertise

Experts agreed that finding *shared goals* is important, but difficult to reach. “It is a continual process of harmonization between all stakeholders involved, that presupposes expertise, communication skills” (P5) and shared language (S7). Other experts stated that not only shared goals, but also “diversity and private interests are driving forces”, and “tension between the goals of partners can be fruitful” (P1, S4). “In particular young innovators like to work according to their individual drives” (S5, P7).

About *subject matter expertise*, experts made relativistic remarks. One said “If there is no reciprocal subject matter expertise, there is no reciprocal attractiveness” (S1), another stated “It is not necessary to have the right subject matter expertise, but to be a real expert in something” (P4). Or, “More important than one person with high expertise, is that all fit together. The combination of different expertise brings about new things” (P3).

A second element that was brought in about expertise was the importance to be boundary-crossing and creative thinking (P1): “Expertise is important but can be found by linking with outer networks, especially because it is not always known in

the beginning what kind of expertise is necessary" (S6). "Most important is the willingness to learn and the motivation for the task" (P6).

A third condition for fruitful co-creation appears the way a team can handle its expertise: "to accept and combine views, to give each other space to have different ideas, to be able to solve friction and trust each other (S5)". "This process of co-creation is a kind of 'double-loop learning' because acquired ability can be used in future projects (S5).

The third mechanism, *innovation capability*, was found "a core factor for co-creation" (S4). Difference was made between individual, team and organizational innovative capability. Individual innovative capability was perceived as the personal attitude to 'think out of the box', to link and see possibilities. "It is a personal property and more important than subject-matter expertise" (S5). Team innovative capability was thought even more important. "It exists through the combination of team members, constructing together" (P6). "Depending on the process, a team need 'out of the box' thinking innovators or innovators who persist and have perseverance" (P6, P7). Organizational innovation capability was seen as "the will and ability of an organization to create space for the right persons to innovate, and as the capacity to implement the new products, processes and services" (S2).

Action

Both groups of experts found *collaboration and communication* the most important mechanisms. But, as the terms were too flat, it was suggested to add the adjective 'multilevel'. The systemic dynamics (S7) of *continuous multilevel collaboration* with external experts, stakeholders, users and colleagues was found the most critical success mechanism for sustainable co-creation. A combination of research-design-implementation appears effective collaboration (S7).

Constructive communication in the team is mentioned by all as an important mechanism: to understand, stimulate, judge what the other means, accept what is possible, regulate conflict, respect other's meaning, find consensus, be result-oriented (P3, P7). Communication also supposes "speaking the same language", "being at the same level" (P2, 3, S5, 6). "How this can be realized, depends on a complex of factors, sometimes on the presence of one single person" (S6). Especially external communication was found necessary: "it brings in new ideas and avoids blind spots" (S2), and "communication with future users throughout the whole process, stimulates acceptance" (P3).

The last mechanism, *courage and decisiveness*, was highly valued, although it was found not easy in practice ‘to dare and do’ in hierarchical organizations with strict rules and structures (P5). Some experts stated that “it is enough to have in a team some people with this attitude” to be successful (P3, S6).

Urgency

Most experts saw an urgent question or problem a starting point for co-creation, but differed about its manifestation. Two emphasized “a personal passion” as starting point (S2, 5), one mentioned “a motivating goal and mission” (P5), a third added “new technological possibilities” (P1).

3. Which actors and activities are important in co-creation processes?

The co-creation practices referred to by the experts, were mainly structured innovation projects between organizations in businesses and education domain. Actors in these practices were most times a steering committee, program manager, team leaders and team members. They appeared to have different roles per dimension. In the ‘construction’ quadrant, the steering committee and program manager are most influential (P3, 6), while the team leader and team members are dominant in the other three quadrants (P3, 4, 5, 7), and especially the team leader is influential. Specifying activities seems difficult because “there are no blueprints” (S7). “Activities are context- and actor-driven, innovation processes are ‘chaordic’ (P6, 7) and extremely dynamic (S1).

Nevertheless some general patterns of actors and activities could be identified: in the construction phase a steering committee “grants autonomy, arranges facilities, and provides support” (P5). “ Programme managers mainly have the role as facilitators. They are change agent, mediating among steering committee, team, and stakeholders” (P1, 5), and “they have to be a marketer in order to tell and sell the successes” (P5). The team leaders mainly have to empower the team members. “This is effective if they show transformative, appreciative leadership (P1, 3, 5, S1, 3, 4) and ensure a balance between relation and emotion, expertise and action (P7). Also the team members can share team- and task-oriented activities, when they (S1, 6): “create an atmosphere of togetherness, stimulate different views, collaborate with external networks and communicate with other levels within the organization” (P1, 3, 6). One expert added that “experiential learning by team members is an important activity, because it increases their capabilities for future innovation” (S4). The role of an HR professional seems not always clear and differs per context. They can be a programme manager or a mentor or organizing training courses that are wishful, “for instance a training in creativity or in teamwork” (P1).

4. *What is the value of the 'Co-Creation-Wheel' for practice and future research?*

The scholarly and practice experts appreciated the 'Co-Creation-Wheel' as a systematic and comprehensive presentation of their experiences. "The format of the wheel points to the dynamics of the process and to aspects that are connected to each other" (S3). Experts recognized the quadrants as the main dimensions in co-creation. No one suggested adding another dimension. The simplicity of the wheel was found enlightening and complete.

Both groups of respondents saw the Wheel as an inspiring reflection instrument for practitioners: "CREA, the acronym, is strong, and the colors are inviting" (P1, S6). "It is a 'learning' instrument usable by programme manager, team leader or team members" (P1, P5, S5). The scientific experts appreciated the Wheel "because of its new combination of known elements" (S3) and "ordering of multidisciplinary mechanisms" (S4).

There were also critical remarks: "The Wheel does not show enough of the dynamics (S2) and the contextual base (S3)" and some terms "are too broad" (P1). Based on these comments we came up with a second version of the Wheel (see Figure 2) that uses more specific terms, adds contextual factors, and shows the dynamics.

7 Discussion

Based on the present study on the 'Co-Creation-Wheel', we want to discuss some specific elements of co-creation processes. We do this broadly in line with the four research questions we have addressed; this is followed by some general discussion on co-creation and innovation and comments on the role of HR for co-creating professionals.

The importance, interdependency and function of the four dimensions and twelve mechanisms of the 'Co-Creation-Wheel' (research question 1 & 2)

In practice co-creation is a fuzzy process, unpredictable, with surprising movements and results. Yet, four dimensions can be discerned that prove to provide a helpful framework to grasp the interactive processes in co-creation practices, "*when the wheel is spinning*". They indicate the multi-colored dynamics. All four dimensions play a role in effective co-creation processes, but most important is the 'action' dimension, followed by the 'relation-emotion' dimension, the 'construction' dimension and finally the 'expertise' dimension.

Although the exact appearance of the processes of co-creation and their function highly depend on the specific context of the innovation practice and the actors involved, it is obvious that all dimensions influence each other, are interdependent, and have to be of a certain quality.

All twelve mechanisms of the 'Co-Creation-Wheel' proved to be important for successful co-creation. Of them, most influential are the action mechanisms *internal and external communication*, *multi-level collaboration* and *courage to act*. *Trust*, *a positive spirit* and *a pleasant atmosphere* in a *divers composed team*, are necessary mechanism for a safe and stimulating team environment to be creative, while *autonomy to act*, *managerial support* and *enough facilities* form the organizational backing in a process of uncertainty. Combined with *innovative capability* of team members, these conditions stimulate to find *shared goals* and to add new knowledge to the existing *expertise* and finally co-create new solutions. The systemic dynamics between the *outer and inner context* have to be reflected too as influencing, and there is always a motivating *urgency*, - a personal passion or an organizational necessity-, to set the wheel in motion.

Other studies (Amabile, 1996; De Jong, 2010; Granovetter, 2005; Isaksen, et al., 2010; Cohen and Prusak, 2001) also reported factors or emphasized the 'relational approach' and 'social communication' for learning and innovation practices (Kessels, 2001; Verdonshot, 2011). What this study adds to the existing knowledge, is the ecological approach of innovation, the dynamics of the multi-level and multi-disciplinary mechanisms, the ordering of the mechanisms per dimensions, and the empirical basis of the findings. This ecological approach matches with studies about collaboration (Bronfenbrenner, 1992), theories about chaordic organizational processes (Hock, 1995) and organic systems (Homan, 2013), which state that innovation processes are too complex and too unpredictable to design linear models.

Important actors and activities in co-creation processes (research question 3)

It is the social construction by all actors in the co-creation setting, including the future users of the new products, processes and services, that colors the co-creation process and stipulates its quality. If an innovation has to be successful and sustainable, actors at all levels have to be involved and to play their complementary roles. This means also that interventions, to stimulate the co-creation process, are not the exclusive responsibility of management but that intervention by all involved actors is favorable. Of all actors, the team leaders are by far the most important players, provided they perform 'positive' leadership: accept and motivate team members, stimulate openness and trust, invest in a pleasant and safe environment, create a

learning atmosphere to find and share knowledge and to design and implement new products, processes or services-, and channel constructive conflicts. In a good team, these actions can also be performed by team members, as shared leadership, which was also reported by Sparrow (2013), Isaksen and Ekvall (2010), Von Stamm (2014) and Kessels (2012).

The value of the ‘Co-Creation Wheel’ for practise and future research (research question 4)

The main result of this study is a revised ‘Co-Creation-Wheel’, as holistic and systemic presentation of interactive mechanisms in co-creation processes (see Figure 2), suitable as intervention instrument for HRD and professionals in innovation practices.



Figure 2. Revised ‘Co-Creation-Wheel’ (Ehlen, Van der Klink, Boshuizen, 2014)

Elements added

Compared to the previous model of the Co-Creation-Wheel (Figure 1) elements in the outer circle were added to highlight the environmental context that influences the stages of the co-creation process: internal factors, - organizational innovation capability-, external ones, - technological possibilities, external expertise-, and a mixed one, the adoption by users. Also added is the element 'diversity' in the dimension construction, and the adjectives 'good' to atmosphere, 'multi-level' to collaboration and 'internal/external' to communication. With these additions the final version of the Wheel demonstrates a more dynamic representation of co-creation processes.

Literature suggests that "creativity and innovation represent multifaceted and inter-related processes that depend upon the interaction of the individual with the social and organizational environment" (Loewenberger, 2013, pg. 425-426), and various writers have called for multi-level research and empirical validated interactional models (George and Zhou, 2001).

Our deduced 'Co-Creation-Wheel' is an interactional model, grounded in previous empirical studies. It provides a framework for individual, group and organizational characteristics and behaviours and demonstrates the convergence of multiple factors as mechanisms for co-creation, as suggested by Amabile (1996), Mumford & Gustafson (1988) and Woodman, Sawyer and Griffin, (1993).

Comparison with other views

A comparison of the final model with prevailing views, proposed by influential scholars on this topic (Amabile, 1996; Isaksen, 2007; Treffinger, 2014), has revealed interesting overlaps and differences (see Table 2) and shows the added value of the model.

As can be seen, although the terms are not exactly the same, there are significant similarities and differences between the meaning of the juxtaposed terms. Overlap can be seen in the construction and relation-emotion dimension. Amabile mainly mentions organizational conditions, and Isaksen and Treffinger emphasize relational and emotional climate factors. Isaksen/Treffinger's term 'debate' stipulates different viewpoints, ideas, experiences and knowledge (Treffinger, 2014), which could be interpreted as our term 'diversity'. Amabile and Isaksen/Treffinger mention 'autonomy/freedom', as we do. On the expertise dimension there is only one item given, namely 'challenging work', and as 'action' only Isaksen/Treffinger speak about 'risk

taking’. Yet, they mention the item ‘action’ in their framework of Creative Problem Solving (Isaksen, Dorvall, and Treffinger, 2010). These dimensions obviously are barely in their scope. Also the findings of our two previous case studies on innovation processes have demonstrated that the two last two important dimensions too easily are taken for granted.

Table 2. Comparison of factors for innovation

Dimensions	Co-creation Wheel	Amabile	Isaksen/Treffinger
Construction	diversity		debate
	autonomy	autonomy/freedom	independence/freedom
	support and facilities	organizational and supervisory encouragement; (lack of)organizational impediments; lack of workload pressure; sufficient resources; work group support.	idea support; idea time
Relation/emotion	trust		trust/ openness
	team spirit		lack of conflict; involvement
	good atmosphere		play/humour
Expertise	shared goals		
	subject matter expertise	challenging work	challenge
	innovation capability		
Action	multi-level collaboration		
	internal/external communication		
	courage to act		risk taking

7.1 Implications for the role of HRD in organizational co-creation practices

As shown in our previous studies, co-creation practices offer a rich learning environment in which professionals develop their ‘resources’ as innovators and make them capable for future tasks. Co-creation therefore can be seen as ‘informal workplace HR’ that needs to be recognized and facilitated.

What can be the role of HR in co-creation practices?

The first prerequisite of HR is to look with an ‘ecological’ lens to see the holistic and systemic process and to discover helpful interventions. HR could connect to co-

creation practices as a constructive friend, a coach or mentor, and in an informal way (Ehlen, van der Klink Boshuizen, 2012; Poell, 2012) stimulate, support and sustain (Loewenberger, 2013) human and social resources.

Following the dimensions of the 'Co-Creation-Wheel', the HRD-role could be for different levels:

1. Stimulate a positive organizational climate: be a protagonist for employee autonomy at management level, invite motivated employees, arrange facilities for innovators, create support at managerial level.
2. Stimulate a positive team climate: create a safe, challenging working and learning atmosphere, assist the team leader and train the team in social- and communication skills.
3. Support creative knowledge production: invite external experts, stimulate knowledge sharing, and knowledge productivity, train creative problem solving and boundary crossing.
4. Sustain collaboration: enhance communication between all levels, reward courage and decisiveness.

7.2 Implications for co-creation practices

As co-creation becomes increasingly important in knowledge-intensive organizations, and industries as well as universities look to each other for collaborative explorations, creative and engaged professionals are the capital for future developments. The group and collectivity then becomes more important, because breakthroughs come from "group genius", not lone epiphanies (Johnson, 2010). The group structure provides apparently opportunities for individuals to influence the content by bringing their cognitive diversity to help elaborate problems and share solutions (Lévy, 1997). The answer or insight is not already out there, waiting, it has to be discovered through interaction that generates new ways (Shotter, 2005).

To summarize:

"In creation and co-creation, the process generates an answer while recognizing that many other answers would have been possible in a different process and with different participants". This statement of Delanda (2002, 11) captures the essence of this study. It expresses the dynamic process and emphasizes that co-creation depends on the quality of the participants.

7.3 Limitations and directions for future research

Although this study has resulted in the validation of the deduced ‘Co-Creation-Wheel’, its validity could possibly be restricted to innovation practices in structured projects with multiple levels and stakeholders, as this study is mainly based on experience with large-scale inter-organizational industry-school-programmes. Another limitation possibly could be the number of experts consulted. It might have been stronger to add an interaction round with all experts on the findings, usual in Delphi studies. All experts who participated in this study highlighted the efficacy of the model and the particular ways it could be used by the various actors in the co-creation and innovation process. They found the model worthy to be tested further in different co-creation contexts. More research has also to be done on the role of HR in stimulating, supporting and sustaining co-creating professionals. Perhaps HRD has to focus on teamwork, shared leadership and creative common problem solving? From Human-Resource Development to Social-Resource Development?

8 Conclusion

Our present study on co-creation, plus our two previous related studies, have demonstrated that colleagues are willing to help others for the intellectual, social and hedonic benefits of sharing (Nambisan and Baron, 2009). But, to be creative, they need environments where there is the opportunity to experiment with ideas, without any conscious end goal. This makes the point that rather than focusing on how to spot individual creativity, co-creation practitioners and HRD professionals should concentrate on how to make groups productive.

To make the ‘Co-Creation-Wheel’ spin’, it is to the Co-lllectivity to:

- C - onstruct an environment where innovation thrives
- R - ealize positive relations and emotions within the team
- E - nable expertise and creative knowledge production
- A - ctivate collaboration and communication between all levels

This is what Magala (2009) calls the “postmodern pattern of sense making” where there is a transparent, flow of social communication built around the negotiation of meanings that leads to a networked, social world. The implication for organizations is, that co-creation ought to be viewed as a process that provides an opportunity for on-going innovation.

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General Discussion

This chapter summarizes the key findings and the answers provided to the three general research questions, and discusses the implications of the reported studies for theory, for future research and for practice.

1 Introduction

Increasingly, collaboration between industry and education is being exploited as a way of improving the quality and relevance of education. The purpose of this dissertation was to advance our understanding of large-scale (inter)-organizational innovations in which education and industrial sectors collaborate and to contribute to the improvement of the underlying processes. Previous research (Field, 2005; Kostova & Roth, 2003; Leana & Van Buren, 1999; Tsai, 2001) has identified 'Social Capital' as an enhancing factor for innovations in different domains, but in the domain of education Social Capital appears to be a fairly unknown concept. The studies in this dissertation aim at the following research objectives: 1) to provide insight in the concept of Social Capital, 2) to explore the possible contribution of Social Capital to large-scale inter-organizational innovations, and 3) to develop an instrument that supports professionals in collaborative innovation practices from a Social Capital perspective. The concepts of Social Capital and innovation were theoretically explored by means of a review of the literature and were empirically examined with the use of two case-studies.

The literature review (Chapter 2) revealed the long standing history and the different meanings attached to Social Capital over time, explored its essential features and identified the advantages of the Social Capital concept compared to other prevailing theories on innovation in education. An initial framework was developed, mainly based on the three-dimensional model of Nahapiet and Ghoshal (1998) on Social Capital and knowledge creation, and expanded with a fourth dimension, the action dimension.

The first case-study (Chapter 3) consisted of a three-year long participatory study of a large-scale industry-school partnership, the project 'Limburg Leisure Academy'. The findings showed how the Social Capital dimensions contributed to the process and outcomes of this inter-organizational innovation. The second case-study (Chapter 4), a large-scale industry-university partnership in the health care sector, examined specifically the activities of the actors and the factors that produce new knowledge. The concept of 'knowledge productivity' proved suitable to describe these innovation activities (Kessels, 1995, 2001), and was added to our initial re-

search framework. This resulted in an adjusted model with more specified relations between Social Capital, knowledge productivity and innovation.

The first three studies informed the development of an instrument of success factors for collaborative innovation that offers innovators guidelines, which we called the '*Co-Creation-Wheel*'. In the final expert consultation study (Chapter 5) the usefulness of the '*Co-Creation-Wheel*' for practice and theory development was examined.

In summary, we placed Social Capital in the context of innovation, which showed us gaps in Social Capital theory regarding production of new knowledge (knowledge productivity). Collaborative procedures and ways of working (co-creation) proved to be essential for developing new knowledge and other innovative outcomes.

2 Main Findings and Conclusions

The historical overview of conceptual literature and empirical studies (Chapter 2) since the first publication by educational reformer Hanifan (1916) supported the conclusion of strong evidence for the influence of Social Capital on innovation in a broad range of social sectors and for different goals (see, for example, Field, 2005; Kostova & Roth, 2003). The literature clearly showed that Nahapiet and Ghoshal's model (1998) of creating collective knowledge is still leading in the contemporary discourse on Social Capital. Their model distinguishes three dimensions that are conducive for generating new knowledge: the structural, relational and the cognitive dimension, respectively. Though this model appears to be promising for researching complex innovations, a number of studies revealed the importance of the dimension 'actions'. Therefore we repositioned the component 'collective actions' of Nahapiet and Ghoshal's model as fourth dimension 'actions', in our framework that guided the research activities in both case studies.

Next to exploring the concept of Social Capital, the review of the literature also compared this concept with other prevailing theories on innovation in education. The comparison with (see Table 2 of Chapter 2) the 'organizational development theory', the 'concerns-based adoption model', the 'cultural–historical activity theory' and the 'social network theory' led to the conclusion that Social Capital theory offers a promising framework for exploration of large scale and complex innovations. The Social Capital perspective presents by its comprehensiveness a holistic framework for the dynamic and complex processes of co-creation. It emphasizes the role of the actors/professionals as co-creators in innovation, and clarifies the neces-

sary conditions in structure, relation, cognition and action for the co-creation of new value. Finally, the literature did not provide any evidence that the concept of Social Capital has been applied for studying large-scale inter-organizational innovations in the domain of vocational and higher education.

This thesis examined empirically, in two case studies, the contribution of Social Capital to innovation. The first case-study focused on the relations between the four Social Capital dimensions and the innovation process and outcomes of an innovation project, the second case emphasized the knowledge productive actions of the innovators in a second project. The studies allow drawing the following conclusions.

Firstly, all four dimensions of the model require a certain minimum quality, to contribute positively to the dynamic process of innovation and to its outcomes. However, dimensions differ in their significance during the various phases of the innovation process. For example, the case study reported in Chapter 3, indicates that the structural dimension seems most important in the first and second phase, the relational plays an important role in all phases, the cognitive in the middle phases, and the action dimension is most visible and important at the end of the project (see Chapter 3).

Secondly, though all four dimensions contribute to the process and outcomes of innovation, the relational dimension appears to be the most crucial dimension for initiating and continuing the process of innovation. This refers to the importance of aspects such as trust and a pleasant atmosphere within the group of innovators. Also sound relationships with professionals outside the own group is found to be an aspect of the relational dimension which is conducive since this offers access to expertise not available in the own group. The importance of the relational dimension was also reported by the experts that participated in the final study (see Chapter 5). They mentioned that its contribution is often not acknowledged as most vital for innovative actions. Enhancing the quality of the relationships between participants within innovative projects is seldom deliberately initiated.

Thirdly, innovation requires subject matter expertise as well as expertise on the process of innovation. In the first case study (Chapter 3) the expertise of most educational participants was primarily restricted to didactical and content knowledge. Their understanding of collaborative work on creating new knowledge and its implementation into their home organizations was far less prominent. However, participants themselves were not aware of the importance of innovation expertise. The lack of this knowledge productive expertise as an important explanation for the struggling nature of the process of innovation was not mentioned by participants

during interviews, but was recorded only by the researchers during their participative observations of meetings. For that reason the initial framework of Social Capital that was applied in the first case study has been expanded by including the concept of knowledge productivity (Kessels, 2001). The findings of the second case study (Chapter 4) provided indications that participants were more capable in designing their own innovation and they were more aware of the contribution of this particular knowledge productive expertise for achieving the desired outcomes. These outcomes concur with Messmann and Mulder (2011) who stated that teachers' competencies to design and steer processes of innovation are often underdeveloped and cause a barrier for sustainable innovation in education.

Fourthly, the findings indicate that responsibility and autonomy influence significantly the process and outcomes in both case studies. Allocating decision authority to the innovators, a clear division of responsibilities within the entire project, decisions on group composition to ensure diversity in groups, and the assurance that the innovation outcomes will be accepted by the own home organization are examples of measures that influences innovators' willingness to continue their efforts. The reluctance of the participating organizations to allocate sufficient responsibility and autonomy to their own representatives in the innovation project had a negative effect on the innovation process and on the implementation of its outcomes within the participating organizations.

Fifthly, the findings point at the importance of taking into account the notion of interrelatedness. Innovation is not a matter of addressing the aspects of the structural dimension or the relational dimension, rather it is how the four dimensions mutually enact and generate innovation. For example, it is not only the existing expertise within the project nor the ability to generate actions but it is the combination of the two that makes the difference. The Social Capital framework as such does not stress the importance of interrelatedness of its dimensions. The concept of knowledge productivity (Kessels, 2001) emphasizes the intertwinement of expertise and actions as utmost important for 'producing' the innovation (see Chapter 4). Study three found eight steps in the process of knowledge productivity, which demonstrate this interconnectedness.

Finally, the two case studies contribute to the understanding of the dynamics of innovation and add the ordering of the aspects per dimension to the current insights on innovation theories. The findings of the studies match with, for example, the ecological approach to collaboration of Bronfenbrenner (1992), theories about chaotic organizational processes (Hock, 1999), and the research on organic sys-

tems (Homan, 2013), which states that innovation processes are too complex and too unpredictable and that linear models ignore the essence of innovation.

The last study in this dissertation aimed at developing an instrument that supports professionals' understanding of innovation practices from a Social Capital perspective. The findings of the literature review and the two case-studies informed the design of the Co-Creation-Wheel, a model of mechanisms of successful innovation. The wheel displays the four dimensions and per dimension the most important elements are included. This model was validated by experts from practice and science, who appreciated it as a sound contribution to the theory on inter-organizational co-creation, and considered the wheel as a supportive guideline for practitioners (see Figure 2, chapter 5). The participating experts proposed minor adjustments that emphasize the interrelatedness of the dimensions and avoid a possible linear perspective on innovation with structure as the starting point and action as the final stage. Moreover, the participants stressed the necessity of avoiding a too narrow focus by only concentrating on the innovating team itself and therefore they advocated to include in the wheel elements that make innovators aware of how the outside world is connected to their own efforts.

3 Methodological Reflections

Several methodological issues of this research have to be considered, especially regarding study 2, the Limburg Leisure Academy (LLA) case. An advantage of this qualitative, longitudinal study is the possibility to be 'in' the process and to gather rich and detailed data. The longitudinal approach revealed dynamics of the processes, and interdependence of elements, actors and phases. However, such a study is time-consuming, the large set of data requires considerable time for analysis, and at least the involvement of two researchers, to ensure sufficient quality and validity.

The participative methods applied in the LLA case are methods of action research. Data collection and data analysis consisted of ongoing, alternating processes during the whole project period, sometimes chosen in consultation with the project management. The use of these research instruments influenced the innovation process because they enhanced the understanding of both innovators and project management of the processes taking place and their relations. This learning effect was welcomed, and became a goal of the project management and the researchers in their role as consultant but has definitely affected the kind of phenomena that occurred, their frequency and capabilities of innovators. In the second case, interviewees made similar comments. Participation in the interviews stimulated insight in the

process of the project, in their position, and in the capabilities to innovate. Undertaking this kind of participative research is seen as a stimulating and pleasant way of co-creation between researchers and innovators (Van Dijkum, 2014). Also Andriessen (2014) described these effects as positive goals of practice-oriented research.

Could this research project be labelled as an example of andragogical research (Ten Have, 1973)? Although generally accepted definitions on the essence of andragogical research are still subject of intense debate in The Netherlands (<http://www.andragologie.eu/>), the research project does meet criteria such as improving social practices, individual learning and emancipation of adults, and participative and meaningful actions, also discussed by Kessels and Poell (2004). According to these criteria this research could be labelled as andragogical research.

4 Implications for Research and Practice

4.1 Scientific relevance and future research

Our study aimed to contribute to existing theory by an increased understanding of the concept of Social Capital, its contribution to educational and inter-organizational innovation, and to develop an instrument for professionals in innovation practices.

Firstly, the literature study and the first case study (LLA) extended previous research on Social Capital, by changing the model of Nahapiet and Ghoshal (1998), resulting in a fourth dimension, which proved suitable to investigate innovation practices.

Secondly, the first case study delivered a multi-dimensional measurement instrument of Social Capital, based on the four dimensions, which proved suitable for observation and data analysis. This instrument, however, deserves further examination in other innovation settings.

Thirdly, the first case study (LLA) resulted in an extended questionnaire of inter-organizational innovation practices, based on new insights in the multi-level mediational relationships between Social Capital and innovation outcomes. This instrument already showed his usefulness in other studies on innovation.

At fourth, the two case studies, displayed in Chapter 3 and 4, discovered many new influencing aspects of Social Capital in innovation practices, which can be used as analytic elements in future studies.

At fifth, the studies resulted in a specified model of the relations between Social Capital dimensions, knowledge productivity, innovation process and outcomes, which proved suitable in these studies, and can be used in future research attempts to study these relations.

At sixth, the instrument 'Co-Creation Wheel' was developed, based on the findings of the first three studies, and was validated by practitioners and scholars as valuable for science and practice. More research is welcome to assess whether the use of this model would be valid in other settings.

Moreover, our findings offer additional insights into the dynamic and holistic character of Social Capital, into the complexity and serendipity of inter-organizational innovations, in suitable conditions for innovators and in success factors for co-creation. They show also gaps in knowledge productive and innovation capabilities of innovators, which requires further research from HRD perspective how to address this.

4.2 Relevance for practice

We think that our studies were and will be useful for practitioners in several ways in order to increase the innovation capability to co-create, especially in inter-organizational teams.

Firstly, this research has been relevant for the actors of the two cases, by the collaboration with the researchers during the innovation activities. At the one hand, questions by researchers stimulated reflection by the case participants, at the other hand, new insights developed by researchers resulted in new knowledge and actions applied in the project. The project management, which could not monitor the project as intensively as the researchers could, also gained more valuable insights into the work and outcomes of the project teams. Also, the regular feedback of the researchers on the process in the LLA case and the common deliberations on possible interventions, were welcomed. The findings of the researchers also opened the eyes of innovators, steering committee and grant-suppliers about the value of incidental outcomes for organization and professional, which they had not recognized. Especially in the first case-study, but also in the second one, the Health Care Parkstad project, interviews were deliberately focused on this topic.

Secondly, we think that the Co-Creation-Wheel can be used in innovation teams to diagnose the innovation process, leading to interventions on elements that need more attention, and in this way reinforce the self-supporting power of the practi-

tioners. The Co-Creation-Wheel could also be useful at the start of an innovation project as a tool to compose innovation teams with enough diversity, autonomy, facilities and support.

Furthermore, the new insight on the importance of the relational dimension, for instance of team spirit, good atmosphere and trust was an eye-opener for most practitioners. This can lead to future improvement by paying attention to these aspects.

At fourth, the surprising new insight that subject matter expertise is less important than innovative capability and action, can lead to other decisions on the allocation of team members, for instance. Even more, our observations showed that few team members have enough innovation attitudes, skills and knowledge, while most of them are unaware of this.

Next, the finding that ‘co-creative action’ is the most important dimension in co-creation projects, should, especially in the educational field, be a stimulus not to be too ‘academic’, but to be aware of the importance of creative, experimental and entrepreneurial behaviors.

At last, an important finding for practitioners and HRD professionals is the learning effect of innovation practices for the innovators at all levels. We observed that the reflection during an interview or member check often reveals and enforces these learning effects. However, this learning perspective receives little attention in research and practice (see, for example, Savelsbergh, 2010).

5 Recommendations for Policy, Practice and HRD

In the concluding sections of the Chapters 3, 4 and 5, already some recommendations for practice have been given.

We repeat the main ones here and add some new and overarching ones.

Organize innovation projects in a way that serendipity, incidental learning and outcomes, will be recognized and exploited for the good of the project and the participating organization(s) in the active project period as well as in the evaluation phase.

Managers and HRD professionals should regard innovation as an organic process of a diversity of professionals with valuable resources who deserve support and care, trust and autonomy to be the owner of the problem, the method and the destination.

Apply the Co-Creation-Wheel as a diagnosis- and reflection instrument not as a linear model, but as an inspiring flexible guideline:

- take care for a stimulating innovation environment
- create pleasant and positive relationships between all levels
- enhance to think out of the box and to cross borders
- stimulate creativity and communication inside and outside.

HRD professionals:

- strike a balance between organizational and individual needs;
 - target social capital as supporter, coach and mediator;
- enhance training of collaborative teamwork, knowledge productive skills,
 - innovative capability, creativity and problem solving.

To realize sustainable innovation it is necessary to listen to the voice of the future users because without them real co-creation cannot be successful.

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Summary Samenvatting

Summary

The past decades have been characterized by large-scale educational innovations aimed to supply the society with knowledge workers, who are able to answer the demands of the knowledge economy. Educational innovations were common across Europe and beyond, but acceptance and success differed strongly, usually for unknown reasons. Research on influencing factors offered insufficient answers, which made empirical research welcome.

This dissertation is a result of new empirical studies, aiming at large-scale innovation processes between the educational sector and businesses. Its intention is to collect relevant empirical knowledge, helpful for such complex innovations. As earlier research in several domains indicated that 'Social Capital' is an enhancing factor for innovation, this research addresses the relation between large-scale innovation processes and Social Capital in so-called Industry-School-Partnerships.

The research is geared towards three objectives:

1. To provide new and deeper insights in the concept of Social Capital;
2. To explore the possible contribution of the concept of Social Capital in understanding the dynamics of large-scale educational innovations;
3. To design an instrument for practitioners in order to improve educational innovations.

The main concepts that are evaluated in this thesis involve 'innovation', 'Social Capital', 'knowledge productivity' and 'co-creation'. Four studies have been carried out to meet the objectives: a literature review on the relation between Social Capital and innovation, two case-studies of large-scale innovation projects between education and business sectors, and a validation study on the instrument we developed targeting innovating practitioners, the 'Co-Creation-Wheel'.

The key chapters of this thesis have been built on four articles, published in and submitted to international journals, and presented at international conferences. These chapters can be read separately. Inevitably, there is some overlap between the chapters.

One Hundred Years of 'Social Capital': Historical Development and Contribution to Collective Knowledge Creation in Organizational Innovation

Chapter 2 presents a literature review about Social Capital and innovation in order to increase insight in the theory of Social Capital in relation to innovation. It also develops a research framework for the empirical studies of this thesis.

The literature review focused on the domain of professional education, non-profit organizations, and knowledge organizations and reports on peer-reviewed, mostly empirical research about Social Capital and innovation during the period 1916 until 2014. The search terms included 'Social Capital, 'Social Capital and innovation', 'innovation', 'education and innovation' and 'educational innovation'.

We found strong evidence of the influence of the concept of Social Capital on innovation in a broad range of social sectors and socio-economic sciences. Social Capital refers to relationships, to active connections and/or social networks that result in increased value or productivity and involve mechanisms through which knowledge can be transferred from one to another. It is based on a set of social interaction assets, such as shared norms and values, trust, mutual understanding and collaboration that enable people to benefit from each other (Anderson, 2008; Bourdieu, 1986; Coleman, 1990; Paldam, 2000).

We also presented an extended historical retrospect of the evolution of Social Capital theory, including its origin, applications and meanings in various periods with a view to a better understanding of the roots and meaning of the concept of Social Capital (see chapter 2, Table 1). Surprisingly, the retrospect showed that even though the roots of Social Capital lay in the educational domain, the concept only regained attention from educational innovators in the last twenty-five years. Currently, it is an intensively researched and highly valued concept, especially in management, economics and social sciences.

A model from Nahapiet and Ghoshal (1998) proved to present a valuable framework about Social Capital in relation to innovation. Their model illustrates how the process of creating new collective knowledge occurs through the influence of three dimensions of Social Capital and through collective actions.

In order to understand what the Social Capital theory adds to existing theories and models on innovation, we compared the concept of Social Capital with four prevailing theories on innovation in the educational sector: in particular the Concerns Based Adoption Model, Organizational Development Theory, Cultural Historical

Activity Theory, and Social Network Theory. The Social Capital perspective appears to better reveal and describe intangible social interaction processes between innovators, the multi-disciplinary aspects, and dynamics that drive sustainable innovation. As a result, it offers an interesting framework for the study of collective innovation. Capitalising on these findings, we decided to use the model of Nahapiet and Ghoshal to build the conceptual framework for the empirical study of inter-organizational innovation projects between professional education and industry.

Unravelling the Social Dynamics of an Industry-School Partnership: Social Capital as Perspective for Co-creation

Chapter three presents an explorative study of an inter-organizational three-year innovation project, with features of an Industry-School Partnership. We had the great opportunity to participate in this inter-organizational project from beginning to end, as researcher and consultant. The goal was to observe, gather and analyze the innovation activities of the participants at different levels, in order to measure the output and to discover ways to sustain the innovating professionals. The setting of the project is Limburg Leisure Academy (LLA), an innovation project between eight leisure businesses and eight Educational institutions, aimed to improve vocational and higher education for the leisure sector.

The Social Capital model of Nahapiet and Ghoshal (1998) was applied to design the research framework for this multi-case study. Building on the literature review, we added a fourth dimension, the 'action dimension', to the three original dimensions (structural, relational, cognitive) of their model.

Three research questions were formulated:

1. Which Social Capital dimensions stimulate the innovation process?
2. What is the output of the innovation process for participating organizations and professionals?
3. How can the innovating professionals be supported from a Social Capital perspective?

Previous research had shown that in-depth and multi-faceted research is necessary to grasp the dynamics and intangible aspects of interaction in innovation practices. This was the reason why a mix of mostly qualitative methods and instruments was used: document analysis, participative observation, telephone interviews, interventions and reflection, face-to-face interviews, and a questionnaire at the end of the project. Data collection and data analysis consisted of on-going, alternating processes during the whole project period, partially pre-designed and partly developed with

the participants as action research. The abundance of data has been analyzed according to a schedule of the dimensions, project-years and project-teams.

The following answers to the three questions were found.

The research framework with the four dimensions of Social Capital – structure, relation, cognition, action – uncovered detailed characteristics of this complex innovation project. It showed the dynamics of the innovation process and of the Social Capital during the five phases of the project, from preparation until dissemination, and demonstrated not only the multifaceted character of innovation processes, but also how this differed and evolved per project phase. In Figure 4 of Chapter 3, 16 characteristics that played a paramount role in the innovation process, have been ordered according to the four dimensions of Social Capital: structural, relational, cognitive, action. In addition, seven different kinds of innovation output are presented.

All dimensions appeared to be important but each played a different role during the various project phases. The structural dimension seemed to be most important in the first and second phase, the relational played an important role in all phases, the cognitive in the middle phases, and the action dimension was mostly visible at the end of the project.

We found and specified the planned results, in particular the new products, processes and services, and also discovered unplanned and incidental results for the organizations and for the individual innovators. Together the outcomes demonstrate the learning effect of innovation activities for the professionals, and its sustainable benefits for the organizations involved.

Data showed stimulating external conditions for the project, such as funding, motivated partners, a stimulating management, shared values and goals, and urgency of the problem.

Also, we found how the innovating professionals could be supported: by the management, and by the chair and the members of the innovation teams, and the ‘user organization’. Support means that the atmosphere in the organization has to be open and acceptable for innovation, management has to provide enough time and money, the chair of the innovation team has to be able to create a positive relational and emotional working climate, team members need to have enough expertise, innovation capability and communication skills, and finally the innovators need to be able to collaborate, deliberate, negotiate, present and implement. Human resource development (HRD) should consider it as their task to take care for this support, not

only by looking for the right individual competences, but in facilitating the innovators.

Knowledge productivity for sustainable innovation: Social Capital as HRD target

Because hardly any other studies of this kind exist, we wanted to enhance the validity of these findings in a second study, with a different context and participants. We also wanted to develop a stronger focus on the action dimension. A second large-scale innovation project provided the opportunity for some replication of the previous study. This case, the Care Academy Parkstad project, concerned the subsidized Health Care sector, which experienced a high urgency to innovate. A university, a university of applied sciences, institutions of vocational education and the regional government were actively involved in the project.

The action dimension – the knowledge activities of the teams – presented the basis for the creation of products, processes and services. We applied the concept of ‘knowledge productivity’ (Kessels, 1995, 2001, 2004) in order to describe these activities, because this concept emphasized the process of productivity, as well as the outcomes for the organization and for the innovators. Knowledge productivity refers to the competence of individuals and groups to gradually improve and radically innovate procedures, products and services. This concept enabled us to design a more specified research model, with the following main elements: conditions, Social Capital dimensions, process of knowledge productivity, products of knowledge productivity (see Figure 1, Chapter 4).

The specific research questions included:

1. Which knowledge-productive activities lead to improvement or innovation for the organization?
2. Which knowledge-productive activities lead to new capabilities among the professionals?
3. Which dimensions of Social Capital stimulate these knowledge-productive processes?
4. Which external conditions stimulate Social Capital and knowledge-productivity?

A mix of 20 participants – members and leaders of the innovation teams of the Care Academy Parkstad project – were interviewed, extended with document-analysis of minutes from the steering committee meetings and a plenary meeting.

The following findings provided answers on the four questions.

We were able to compose a model of ‘eight steps to sustainable knowledge productivity’, (table 4, chapter 4) that would lead to improvement or innovation of the organization. The model can be used as guideline of design principles for HRD-professionals, or as a self-directed HRD-tool by an innovation group (Poell, 2012). The model is an extension of the three steps of knowledge productivity, described by Kessels (2001), and emphasizes the *collective* knowledge productivity.

Furthermore, we showed that different sets of activities have an impact on the development of specific abilities of the innovators. One example involves the activity ‘to organically design a task path with the group members to create the new products, processes or services’ (step 4), resulted in new cognitive abilities of the innovators. This effect occurred, when innovators saw evidence of new knowledge, skills, and attitudes from each other (Boshuizen & Van de Wiel, 2014). Also, several steps contributed to the development of relational attitudes, such as an open mind, creativity and courage. The participants in this project were delighted to learn and stated that they learned most from experiences in the project if these were connected with their daily work.

Equally, we found that all four dimensions of Social Capital contributed to knowledge productivity. These dimensions are interdependent and play a necessary role in different phases of the process. The relational and cognitive dimensions seemed to be key qualitative conditions for innovation, although only suitable actions transformed this condition into productivity. Relational and cognitive quality depended on the composition of the group.

Every dimension needs to have sufficient quality, which in practice involves:

1. Creating a facilitating environment with autonomy and authority for the innovators and support at all levels;
2. Relationships based on motivation and commitment to a common goal, on trust and on pleasure;
3. A good understanding of each other’s language and knowledge, suitable subject-matter expertise and innovation ability;
4. The courage and capability to act: team development, networking, communicating with all levels involved, and tactfully co-creating.

Four external conditions proved to be stimulating: an urgent problem (also found by De Jong, 2010), a smart task formulation, managerial support and autonomy for the innovators.

The insights in these collective knowledge productive actions of innovation teams, combined with the findings of the first two studies, enabled us to design a model of the main mechanisms for successful innovation. This model can be used as a design-and/or reflection instrument by professionals involved in innovation.

The Co-Creation Wheel: twelve mechanisms to enhance collaborative innovation and to engage professionals

The translation of the findings of the first three studies into an instrument for innovators was the goal of the last study. For this reason, we designed a model of success factors for co-creation in teams, broadening our theoretical framework with the concept of 'co-creation'. This concept aptly expresses the core of collaborative innovation, combining collectivity and creativity. The following definition of co-creation was used: 'a participative process in which people or/and organizations in equivalent dialogue together generate and develop new valuable products, processes or services'.

This study developed and validated the instrument 'Co-Creation-Wheel' (see Figure 1, Chapter 5), a systematic graphical representation of the main mechanisms for successful innovation.

The Wheel exists of three circles and four quadrants, that together form the word *CREA*, the capitals of the dimensions of Social Capital: Construction-Relation-Expertise-Action.

This colored anagram makes the instrument transparent and easy to use in practice. Fourteen experts, scholars and practitioners in areas of educational innovation, organizational change, collaborative learning, and industrial co-creation, validated the model. Two instruments were used, a semi-structured interview and a questionnaire, which served as a quantitative check on the qualitative interview data, which were analyzed using a qualitative content analysis (Miles and Huberman, 1994).

The following four research questions were leading:

1. Which mechanisms and dimensions of the 'Co-Creation-Wheel' do experts discern as important?
2. Which interdependency between the mechanisms and dimensions can be discerned?
3. Which actors and activities are important in co-creation processes?
4. What is the value of the 'Co-Creation-Wheel' for practice and future research?

The findings demonstrated that all four dimensions played a role in effective co-creation processes. However, respondents considered the 'action' dimension most important, followed by the 'relation-emotion' dimension, the 'construction' dimension and finally the 'expertise' dimension. In spite of the fact that the exact appearance of the dimensions of co-creation and their function highly depend on the specific context of the innovation practice and the actors involved, it is obvious that all dimensions influence each other and have to present a minimum quality.

All twelve mechanisms of the 'Co-Creation-Wheel' proved to be important for successful co-creation. The mechanisms of internal and external communication, multi-level collaboration and courage to act were found to be the most influential. Trust, a positive spirit and a pleasant atmosphere in a diverse team were found necessary mechanisms for a safe and stimulating team environment to be creative, while autonomy to act, managerial support and enough facilities formed the organizational backing. These conditions stimulate capable team members to find shared goals, add new knowledge to the existing expertise and to co-create new solutions.

The systemic dynamics between the outer and inner context have to be considered as influencing. A motivating urgency, - a personal passion or an organizational necessity- always set the wheel in motion.

The social construction of activities by all actors in the co-creation setting, including the future users of the new products, processes or services, colors the process and stipulates its quality. To become successful and sustainable, actors at all levels have to be involved and play their complementary roles.

Interventions to stimulate the co-creation process are not the exclusive responsibility of the management and collaboration of all actors is favorable. Of all actors, the team leaders are by far the most important players, provided they perform 'positive' leadership. This includes to accept and motivate team members, to stimulate openness and trust, to create a pleasant and safe learning atmosphere, and to channel constructive conflicts. In a good team, these activities can be performed by team members in the form of shared leadership. Sparrow (2013), Isaksen and Ekvall (2010), Von Stamm (2014) and Kessels (2012) also reported these elements.

In a guideline of the Wheel for practitioners, this could be specified as follows: The management, chair and members of the innovation group, and the 'user' organization have to be supportive. 'Support' means that the atmosphere in the organization has to be open and accepting for innovation; management has to create 'space', which means enough time and money. The chair of the innovation team has

to be able to create a positive relational, emotional working climate; team members have to have enough expertise, mainly innovation capability and communication skills to be able to collaborate, deliberate, negotiate, present and implement. Thus, support is necessary on micro, meso and macro level.

The experts that validated the Wheel assessed the model as a very relevant instrument for practice and a valuable contribution to science. Only a minor revision was suggested, a specification of the items collaboration and communication, addition of the item 'diversity' in the construction quadrant, and items of external conditions in the outer circle, to highlight the environmental context that influences the co-creation process. With these additions, the final version of the Wheel demonstrates a dynamic representation of co-creation processes.

The main result of this study is the revised 'Co-Creation-Wheel', as a holistic and systemic presentation of interactive mechanisms in co-creation processes (see Figure 2, Chapter 5), and suitable as intervention instrument for HRD and professionals in innovation practices.

The deduced 'Co-Creation-Wheel' presents an interactional model, grounded in previous empirical studies. It provides a framework for the integration of individual, group and organizational characteristics and behaviors, and demonstrates the convergence of multiple factors as mechanisms for co-creation.

This 'Co-Creation-Wheel' should be seen as the final conclusion of these four studies. It demonstrates the value of the four-dimensional model of Social Capital for understanding, influencing and improving large-scale inter-organizational innovations.

To make the 'Co-Creation-Wheel' spin, it is to the collectivity to:

- C - onstruct an environment where innovation thrives
- R - ealize positive relations and emotions within the team
- E - nable expertise and creative knowledge production
- A - ctivate collaboration and communication between all levels.

Closing the circle

Chapter 6 summarizes the four studies and presents the main findings and implications for science and practice. It closes the circle of this research project: Social Capital proves to be the driving force in complex collective inter-organizational innovation. Co-creation remains a creative process, with changing dynamics, depending on context and value-creating relations that deserve time, respect and especially trust in the creativity of professionals.

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Samenvatting

Sinds het begin van deze eeuw zijn in Europa en de rest van de wereld grootschalige onderwijsinnovaties geïnitieerd teneinde de samenleving te voorzien van kenniswerkers die de uitdagingen aankunnen van de kenniseconomie. De acceptatie en het succes van deze innovaties bleken onderling sterk te verschillen, terwijl de oorzaken van deze verschillen veelal onbekend bleven. Het huidige onderzoek naar beïnvloedende factoren bood geen afdoend antwoord en empirisch onderzoek was daarom welkom.

Dit proefschrift vormt het resultaat van nieuw empirisch onderzoek, dat zich richt op grootschalige innovatieprocessen tussen de onderwijssector en bedrijfsleven. Het tracht relevante empirische kennis te vergaren die behulpzaam kan zijn bij dergelijke complexe innovaties. Omdat eerder onderzoek in diverse sectoren aantoont dat 'Sociaal Kapitaal' een bevorderende invloed heeft op innovatie, richt dit onderzoek zich op de relatie tussen innovatieprocessen en Sociaal Kapitaal in grootschalige samenwerkingsprojecten tussen onderwijs en bedrijfsleven

Het onderzoek spitst zich toe op drie doelstellingen:

1. het verschaffen van nieuw en grondig inzicht in het concept Sociaal Kapitaal;
2. het verkennen van de mogelijke bijdrage van dit concept aan een beter begrip van de dynamiek van grootschalige innovaties;
3. het ontwikkelen van een instrument ten behoeve van teams van innovatieve professionals, teneinde onderwijs- en organisatie-innovatie te verbeteren.

De belangrijkste concepten die in dit proefschrift worden onderzocht omvatten 'innovatie', 'Sociaal Kapitaal', 'kennisproductiviteit' en 'co-creatie'. Er zijn vier studies uitgevoerd: een literatuuronderzoek naar de relatie tussen Sociaal Kapitaal en innovatie, twee casestudies over grootschalige innovatieprojecten tussen onderwijs en bedrijfssectoren, en een validatiestudie van een instrument, ontwikkeld voor professionals in een innovatiepraktijk, het 'Co-Creatie-Wiel'.

De kernhoofdstukken van dit proefschrift zijn gebaseerd op vier artikelen, die zijn gepubliceerd in, of zijn ingediend bij internationale wetenschappelijke tijdschriften, en zijn gepresenteerd op internationale conferenties. Deze artikelen kunnen afzon-

derlijk worden gelezen. Hierdoor bestaat er onvermijdelijk enige overlap tussen de hoofdstukken.

‘Honderd jaar ‘Sociaal Kapitaal’: Historische Ontwikkeling en Bijdrage aan Collectieve Kenniscreatie bij Organisatie Innovatie’.

In hoofdstuk twee wordt een literatuurstudie gepresenteerd over Sociaal Kapitaal en innovatie met het doel het inzicht te vergroten in de theorie van Sociaal Kapitaal in relatie tot innovatie. In de literatuurstudie wordt ook een onderzoekkader ontwikkeld voor de empirische studies in dit proefschrift.

Deze literatuurstudie richt zich op het domein van beroepsopleidingen, non-profit organisaties en kennisorganisaties en doet verslag van peer-reviewed, vooral empirisch, onderzoek over Sociaal Kapitaal en innovatie gedurende de periode 1916 tot 2014. De zoektermen betreffen ‘Sociaal Kapitaal’, ‘Sociaal Kapitaal en innovatie’, ‘innovatie’, ‘onderwijs en innovatie’ en ‘onderwijsvernieuwing’.

We vonden overtuigend bewijs voor de invloed van Sociaal Kapitaal op innovatie in een brede range van sociale sectoren in studies in het domein van de sociale- en economische wetenschappen. Sociaal Kapitaal refereert aan relaties, actieve verbindingen of sociale netwerken, die resulteren in toegenomen waarde of productiviteit. Het is gebaseerd op een set karakteristieken van sociale interactie, zoals gedeelde normen en waarden, vertrouwen, wederzijds begrip en samenwerking, die mensen in staat stelt om elkaar tot voordeel te zijn (Anderson, 2008; Bourdieu, 1968; Coleman, 1990; Paldam, 2000). Het betreft mechanismen, waardoor o.a. kennis kan worden overgebracht van de ene op de andere persoon.

Met het oog op een beter begrip van de wortels van en de betekenis van het concept Sociaal Kapitaal (zie hoofdstuk 2, tabel 1) presenteerden we ook een uitgebreide historische terugblik op de evolutie van Sociaal Kapitaal. Dit overzicht brengt de oorsprong, toepassingen en betekenissen van Sociaal Kapitaal in verschillende periodes in kaart. Een verrassende uitkomst bleek dat - hoewel de wortels van Sociaal Kapitaal in het educatieve domein liggen - het concept pas in de afgelopen vijftwintig jaar de aandacht van educatieve innovators heeft herwonnen. Tegenwoordig is Sociaal Kapitaal een intensief onderzocht en gewaardeerd concept, vooral in de management-, economische- en de sociale wetenschappen.

Een model van Nahapiet en Ghoshal uit 1998 bleek een waardevol kader te verschaffen om meer inzicht te verwerven in de relatie tussen Sociaal Kapitaal en innovatie. Hun model illustreert hoe het creatieproces van nieuwe collectieve kennis

plaats vindt, onder invloed van drie dimensies, en door middel van collectieve activiteiten.

Om te begrijpen wat de Sociaal Kapitaal theorie toevoegt aan bestaande theorieën en modellen op gebied van innovatie, vergeleken we het concept van Sociaal Kapitaal met vier invloedrijke theorieën over innovatie in de onderwijssector: het Concerns Based Adoption Model, de Organizational Development Theory, de Cultural Historical Activity Theory, en de Social Network Theory. Deze vergelijking maakte aannemelijk dat het perspectief van de Sociaal Kapitaal theorie beter dan deze andere theorieën in staat is om immateriële sociale interactieprocessen, alsook multidisciplinaire aspecten en de dynamiek tussen actoren, te onthullen en beschrijven. Dientengevolge biedt het een interessant kader voor de studie van collectieve innovatie. Deze bevindingen deden ons besluiten om het model van Nahapiet en Ghoshal te hanteren om het conceptuele kader te ontwikkelen voor de empirische studies van inter-organisatorische innovatieprojecten tussen beroepsonderwijs en bedrijfsleven.

‘De sociale dynamiek van een ‘Samenwerkingsproject Onderwijs-Bedrijfsleven’ ontrafeld: Sociaal Kapitaal als perspectief voor co-creatie’

Hoofdstuk drie presenteert een exploratieve casestudie van een driejarig inter-organisatorisch innovatieproject tussen beroepsonderwijs en bedrijfsleven. We kregen de gelegenheid om van begin tot eind te participeren in dit project, als onderzoeker en als consultant. Het doel was enerzijds om de innovatieactiviteiten van de deelnemers, - op verschillende organisatieniveaus-, te observeren, data te verzamelen en te analyseren, en om methoden te ontdekken die de innoverende professionals kunnen ondersteunen. De case betreft de ‘Limburg Leisure Academy’ (LLA), een innovatieproject tussen acht ondernemingen in de Toerisme- en Vrije Tijd sector en acht instellingen van beroepsonderwijs, gericht op verbetering van het beroepsonderwijs voor deze sector.

Het Sociaal Kapitaal model van Nahapiet en Ghoshal (1998) is als onderzoekskader voor deze casestudie gehanteerd. Gebaseerd op het literatuuronderzoek, voegden we aan de oorspronkelijke drie dimensies van hun model (structurele, relationele, cognitieve), een vierde dimensie toe, en wel de ‘actie dimensie’.

Drie onderzoeksvragen werden geformuleerd:

1. Welke Sociaal Kapitaal dimensies stimuleren het proces van innovatie?
2. Wat is het resultaat van het innovatieproces voor deelnemende organisaties en professionals?

3. Hoe kunnen de innoverende professionals vanuit een Sociaal Kapitaal perspectief worden ondersteund?

Bij het ontwerpen van een geschikte methode, lieten we ons leiden door eerder onderzoek. Dit toonde aan dat een diepgaande en veelvormige studie nodig is, om de dynamiek en de immateriële aspecten van interactie in innovatiepraktijken te begrijpen. Daarom kozen we voor een mix van vooral kwalitatieve methoden en instrumenten: document-analyse, participerende observatie, telefonische interviews, interventies, reflectie, face-to-face interviews, en, aan het einde van het project, een vragenlijst. Dataverzameling en data-analyse vonden plaats in de vorm van een doorlopend proces tijdens de hele driejarige projectperiode. De methoden waren deels vooraf ontworpen en deels samen met de deelnemers ontwikkeld, als een vorm van actieonderzoek. De rijke hoeveelheid aan kwalitatieve gegevens uit deze onderzoeksactiviteiten zijn geanalyseerd met ATLAS.ti, op het niveau van dimensies, projectjaar en projectteams.

Gaandeweg werd dit complexe innovatieproject ontrafeld en een rijkdom aan uitkomsten was het resultaat. Deze uitkomsten zijn hier gecompriëerd per onderzoeksvraag weergegeven.

Met de sociaal-kapitaal-bril werden gedetailleerde kenmerken van de innovatieprocessen ontdekt en geordend in overeenstemming met de vier dimensies: structuur, relatie, cognitie, en actie. Zowel de dynamiek als het veelvormige karakter van het innovatieproces, vanaf voorbereiding tot en met implementatie, is aangetoond. Ook het Sociaal Kapitaal bleek te evolueren. Alle dimensies speelden een verschillende rol gedurende het proces. De relationele dimensie bleek zeer invloedrijk in alle fasen, de structurele dimensie was vooral belangrijk in de eerste en tweede fase, de cognitieve dimensie had een onmisbare functie in de middelste fasen, en de actie-dimensie domineerde in de eindfase van het project. Binnen deze dimensies werden veel onderling afhankelijke aspecten onderscheiden. Figuur 4 van hoofdstuk 3 geeft 16 aspecten weer, die een grote rol speelden in het innovatieproces, geordend volgens de vier dimensies van Sociaal Kapitaal. Het ontrafelen van deze complexiteit, bevestigt niet alleen eerdere kennis, maar breidt deze ook uit.

Het intensieve, participatieve onderzoekproces verhelderde tevens projectresultaten die veelal niet worden onderkend. Figuur 4 van hoofdstuk drie presenteert zeven verschillende soorten innovatieve uitkomsten. We onderscheiden geplande resultaten, zoals nieuwe producten, processen en diensten, maar benoemen ook niet-geplande en incidentele opbrengsten, voor de organisaties en voor de individuele professionals. Deze resultaten tonen het leereffect aan van innovatieactiviteiten

voor de professionals alsook de duurzame voordelen hiervan voor de betrokken organisaties.

De data legden ook externe omstandigheden bloot die het project stimuleerden, zoals financiering, gemotiveerde partners, een ondersteunend management, gemeenschappelijke waarden/ doelstellingen en de urgentie van het probleem.

We ontdekten hoe de innoverende professionals zouden kunnen worden ondersteund door het management, door de leider en de leden van de innovatieteams, en door de gebruikers. Ondersteuning wordt omschreven als:

- De organisatie staat open voor innovatie;
- Het management draagt zorg voor voldoende tijd en geld;
- De leider van het innovatieteam schept een positief relationeel en emotioneel werkklimaat;
- De leden van het team beschikken over voldoende expertise, innovatievermogen en communicatieve vaardigheden, en kunnen samenwerken, overleggen, onderhandelen, presenteren en implementeren.

HRD-professionals moeten het als hun taak beschouwen om te zorgen voor deze ondersteuning, niet alleen door op zoek te gaan naar professionals met de juiste competenties, maar juist ook door – waar gewenst en nodig – de innoverende professionals te faciliteren.

‘Kennisproductiviteit voor duurzame innovatie: Sociaal Kapitaal als HRD doel’

Omdat er vrijwel geen vergelijkbare studies bestaan, wilden we de validiteit van de bevindingen versterken door een tweede studie, in een andere context en met andere deelnemers.

We wilden deze studie tevens richten op de actiedimensie, vooral op de kennisactiviteiten van de innovatieteams die de basis vormen voor het creëren van producten, processen en diensten. Deze kennisactiviteiten hebben we beschreven met behulp van het concept ‘kennisproductiviteit’ (Kessels, 1995, 2001, 2004). Dit concept benadrukt zowel het proces alsook de resultaten van productiviteit voor organisatie en innovators. Kennisproductiviteit verwijst naar de bekwaamheid van individuen en groepen tot het geleidelijk verbeteren en radicaal vernieuwen van processen, producten en diensten. Het concept stelde ons in staat om een specifiek onderzoekmodel te ontwerpen, met de volgende hoofdelementen: externe voorwaarden, Sociaal Kapitaal dimensies, proces van kennisproductiviteit, en producten van kennisproductiviteit (zie figuur 1, hoofdstuk 4).

Een tweede, eveneens grootschalig innovatieproject bood de gelegenheid een vergelijkbaar onderzoek uit te voeren. Deze casestudie betrof het 'Zorg Academie Parkstad'(ZAP) project in de gesubsidieerde gezondheidszorgsector, waar een hoge urgentie bestond tot innoveren. Een universiteit, instellingen voor hoger en middelbaar beroepsonderwijs, diverse gezondheidszorginstellingen en de regionale overheid waren actief betrokken.

De specifieke onderzoeksvragen betroffen:

1. Welke kennisproductieve activiteiten leiden tot verbetering of innovatie voor de organisatie?
2. Welke kennisproductieve activiteiten leiden tot nieuwe bekwaamheden voor de professionals?
3. Welke dimensies van Sociaal Kapitaal stimuleren deze kennisproductieve processen?
4. Welke externe voorwaarden stimuleren Sociaal Kapitaal en kennisproductiviteit?

Een mix van 20 deelnemers - leden en leiders van de innovatieteams en projectmanagers van het Zorg Academie Parkstad (ZAP) project -, werd met semigestructureerde interviews bevroegd, aangevuld met document-analyse van notulen van stuurgroep vergaderingen en plenaire bijeenkomsten.

We ontdekten 'acht stappen van kennisproductiviteit' (tabel 4, hoofdstuk 4) die leiden tot verbetering of innovatie in de organisatie, en ontwikkelden op basis hiervan een model. Dit model is een uitbreiding van de drie stappen van kennisproductiviteit, beschreven door Kessels (2001), en onderstreept de collectieve kennisproductiviteit. Dit model kan worden gebruikt als richtlijn voor ontwerpprincipes voor kennisproductiviteit door HRD-professionals, of als 'zelfgestuurd' HRD-instrument door een innovatie-team (Poell, 2012b).

We tonen tevens aan dat verschillende activiteiten invloed hebben op de ontwikkeling van specifieke vaardigheden van de innovators. Bijvoorbeeld, de activiteit 'om samen met de leden van de groep het werkplan te ontwerpen om nieuwe producten, processen of diensten te creëren' (stap 4), resulteert in nieuwe cognitieve capaciteiten van de innovators. Dit effect treedt op, als de innovators nieuwe kennis, vaardigheden en attitudes bij elkaar ontdekken (Boshuizen en Van de Wiel, 2014). Ook dragen verschillende stappen bij aan de ontwikkeling van attitudes op het terrein van het onderhouden van relaties, zoals het tonen van openheid, creativiteit en moed. De deelnemers aan dit project waren blij om te leren en verklaarden

dat ze het meest leerden van ervaringen als deze met hun dagelijkse werk verbonden waren.

We concluderen dat alle dimensies van Sociaal Kapitaal bijdragen aan kennisproductiviteit. De dimensies zijn onderling afhankelijk en spelen een noodzakelijke rol in de procesfasen. De relationele en cognitieve dimensies blijken belangrijke kwalitatieve voorwaarden te zijn voor innovatie, hoewel alleen geëigende acties deze voorwaarden in productiviteit omzetten. Ook relevant is de constatering dat de relationele en cognitieve kwaliteit afhankelijk is van de samenstelling van de groep, dus van de structurele dimensie.

Elke dimensie dient voldoende kwaliteit te hebben. Dit betekent dat het in de praktijk nodig is om:

- Een stimulerende omgeving te creëren, autonomie en gezag te verlenen aan de innovators, en ondersteuning op alle organisatieniveaus;
- Relaties te ontwikkelen, gebaseerd op vertrouwen en plezier, motivatie en inzet voor het gemeenschappelijk doel;
- Relevante expertise, innovatievermogen, en begrip van elkaars taal en vakkennis te bevorderen;
- De moed en het vermogen te stimuleren om te handelen, te communiceren met alle betrokken niveaus, en met tact te opereren.

Vier externe voorwaarden blijken stimulerend te zijn: een urgent probleem (zie ook De Jong, 2010), een 'smart' taakformulering, ondersteuning door de leidinggevende en autonomie voor de innovators.

Samen met de bevindingen van de eerste twee studies, stelden deze resultaten ons in staat om in de vierde studie een model te ontwerpen dat als reflectie en/of ontwerpinstrument kan worden gebruikt door innoverende professionals. Het model geeft de belangrijkste mechanismen voor succesvolle innovatie weer.

Het Co-Creatie Wiel: twaalf mechanismen om collaboratieve innovatie en betrokkenheid van professionals te bevorderen

Het doel van de laatste studie was om de bevindingen van de eerste drie studies te vertalen naar een instrument voor innovators. Met dit voor ogen, ontwierpen we een model van succesfactoren voor co-creatie in multidisciplinaire teams. Tevens werd ons theoretisch kader uitgebreid met het concept 'co-creatie', omdat dit begrip treffend de kern uitdrukt van collaboratieve innovatie: het combineren van collectiviteit en creativiteit. We hanteerden de volgende definitie: 'een collectief

creatief proces van professionals uit meerdere organisaties, die, in een gelijkwaardige dialoog, nieuwe producten, processen of diensten genereren en ontwikkelen’.

In deze studie ontwikkelden en valideerden we het instrument ‘Co-Creatie-Wiel’ (zie figuur 1, hoofdstuk 5), een systematische, grafische weergave van de belangrijkste mechanismen voor succesvolle co-creatie. Het wiel bestaat uit drie cirkels en vier kwadranten, die het acroniem CREA vormen, de eerste letter van de dimensies van Sociaal Kapitaal: Constructie-Relatie-Expertise-Actie.

Dit acroniem – uitgevoerd in vier kleuren – maakt het instrument transparant en handzaam in de praktijk. Veertien wetenschappers en praktijkdeskundigen op het gebied van educatieve innovatie, organisatieverandering, samenwerkend leren en industriële co-creatie, valideerden het model. Twee onderzoeksinstrumenten werden gebruikt, een semigestructureerd interview en een vragenlijst ten behoeve van een kwantitatieve controle van de kwalitatieve interviewgegevens. Deze gegevens werden geanalyseerd met behulp van een kwalitatieve inhoudsanalyse (Miles en Huberman, 1994).

De volgende vier onderzoeksvragen waren leidend:

1. Welke mechanismen en dimensies van het ‘Co-Creatie-Wiel’ benoemen de experts als belangrijk?
2. Welke onderlinge afhankelijkheid tussen de mechanismen en de dimensies kan worden onderkend?
3. Welke actoren en activiteiten zijn belangrijk in co-creatie processen?
4. Wat is de waarde van het ‘Co-Creatie-Wiel’ voor de praktijk en voor toekomstig onderzoek?

De bevindingen toonden aan dat alle vier dimensies een rol spelen in effectieve co-creatieprocessen. De respondenten beschouwden de ‘actie’ dimensie als de belangrijkste dimensie, gevolgd door de dimensie ‘relatie-emotie’ en de ‘constructie’ dimensie. De dimensie ‘expertise’ werd het minst belangrijk gevonden. Hoewel de concrete verschijningsvormen van de dimensies, alsook hun functie, sterk afhankelijk zijn van de specifieke context van de innovatiepraktijk en van de betrokken actoren, is het duidelijk dat alle dimensies elkaar beïnvloeden en dat alle dimensies een minimumkwaliteit dienen te bezitten.

Alle twaalf mechanismen van het ‘Co-Creatie-Wiel’ blijken belangrijk te zijn voor succesvolle co-creatie. Het meest invloedrijk zijn de mechanismen ‘interne en externe communicatie’, ‘multi-level samenwerking’ en ‘moed om te handelen’. ‘Vertrouwen’, een ‘positieve teamgeest’, een ‘aangename sfeer’ en een ‘divers samenge-

steld team' met 'innovatief vermogen' blijken ook noodzakelijke mechanismen voor een veilige teamomgeving die creativiteit stimuleert. 'Autonomie om te handelen', 'ondersteuning door de leidinggevende' en aanwezigheid van 'voldoende voorzieningen', vormen de organisatorische backing. Deze mechanismen stimuleren om nieuwe kennis toe te voegen aan bestaande expertise en om nieuwe oplossingen te co-creëren.

De dynamiek tussen de externe en interne context moet als invloedrijk worden beschouwd. Er is altijd een motiverende urgentie, - in de vorm van een persoonlijke passie of een organisatorische noodzaak-, die het wiel in beweging brengt. De sociale constructie van de activiteiten door alle actoren in de co-creatie setting, met inbegrip van de toekomstige gebruikers van de nieuwe producten, processen of diensten, kleuren het proces en bepalen de kwaliteit ervan.

Dit betekent ook, dat interventies om het co-creatieproces te stimuleren niet de exclusieve verantwoordelijkheid zijn van het management. Het is juist de samenwerking tussen alle betrokken partijen die gunstige voorwaarden schept. Van alle actoren zijn de teamleiders veruit de belangrijkste spelers, mits ze positief leiderschap uitvoeren: accepteren en motiveren van teamleden, openheid en vertrouwen stimuleren, investeren in een prettige en veilige omgeving, een lerende sfeer creëren en constructieve conflicten kanaliseren. In een goed team kunnen deze activiteiten worden uitgevoerd door de teamleden, als een vorm van gedeeld leiderschap. Dit werd ook onderkend door andere onderzoekers, zoals Sparrow (2013), Isaksen en Ekvall (2010), Von Stamm (2014) en Kessels (2012).

In een richtsnoer van het Wiel voor professionals, zou dit als volgt kunnen worden gespecificeerd: het management, de voorzitter, de leden van de innovatiegroep, en de 'gebruikers' moeten ondersteunen. 'Steun' betekent dat de sfeer in de organisatie open moet zijn en dat de noodzaak van de innovatie geaccepteerd moet worden. Het management moet 'ruimte' creëren, en voldoende tijd en geld vrijmaken. De voorzitter van het innovatieteam moet een positief, relationeel en emotioneel werkklimaat kunnen opbouwen. De leden van het team moeten beschikken over voldoende expertise, innovatievermogen, en vaardigheden om samen te werken, te onderhandelen, en plannen uit te voeren.

Beide categorieën ondervraagde experts waardeerden het Wiel als een zeer relevant instrument voor de praktijk en als een waardevolle bijdrage aan de wetenschap. Slechts enkele lichte wijzigingen werden voorgesteld, zoals een specificatie van de onderdelen samenwerking en communicatie, toevoeging van het item 'diversiteit' in de Constructie kwadrant, en enkele items betreffende externe voorwaar-

den in de buitenste cirkel, teneinde de invloeden van de omgeving te benadrukken. Met deze toevoegingen demonstreert de definitieve versie van het Wiel een dynamische weergave van co-creatieprocessen.

Dit herziene 'Co-Creatie-Wiel', is een holistische en systemische presentatie van interactieve mechanismen in co-creatie processen (zie Figuur 2, Hoofdstuk 5), en is geschikt als interventie-instrument voor HRD en voor innovators.

Tot slot

Het Co-Creatie-Wiel is het eindresultaat van de vier studies. Het toont de waarde van het vier-dimensionele model van Sociaal Kapitaal voor het begrijpen, beïnvloeden en verbeteren van grootschalige inter-organisatorische innovaties.

Om het 'Co-Creatie-Wiel' te laten draaien is de uitdaging voor innovators, het:

- C - onstrueren van een omgeving waar innovatie bloeit
- R - ealiseren van positieve betrekkingen en emoties binnen het team
- E - taleren van expertise en creatieve kennisproductie
- A - ctiveren van samenwerking en communicatie tussen alle niveaus.

De cirkel sluit

Hoofdstuk 6 biedt een overzicht van de vier studies en presenteert de belangrijkste bevindingen en conclusies, met de implicaties voor wetenschap en praktijk.

Hier sluit de cirkel van dit onderzoeksproject: Sociaal Kapitaal blijkt de motor van complexe, collectieve innovatie. Co-creatie blijkt een creatief proces, met een steeds veranderende dynamiek, afhankelijk van de context en van de waarde scheppende relaties tussen professionals. Deze professionals verdienen ruimte, respect, en vooral vertrouwen in hun creativiteit.

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Terugblik en Dankwoord

“Wat wil je nu gaan doen?”, vroeg hij toen mijn innovatieproject ‘Maatwerk’ beëindigd was.

“Ik zou wel onderzoek willen doen naar de onderwijsinnovatie hier op Zuyd”, antwoordde ik. “Okay, maar dan wel een PhD-onderzoek”, zei Karel van Rosmalen, voorzitter van het College van Bestuur van Zuyd Hogeschool. Zo begon ik dit onderzoekstraject naar innovatiepraktijken in het onderwijs. Het begrip ‘Sociaal Kapitaal’ kende ik toen nog niet. Dat hoorde ik voor het eerst uit de mond van Joseph Kessels, die een jonge collega aan mij voorstelde in de tuin van Adviesbureau Kessels & Smit in Utrecht. “Tjip doet onderzoek naar Sociaal Kapitaal, de waarde van relaties”. Onmiddellijk ‘wist’ ik dat dit een verklaring zou kunnen zijn voor de grote verschillen in de resultaten van innovatiepraktijken die ik bij opleidingen van Zuyd Hogeschool was tegengekomen als programmamanager van het hogeschool-brede innovatieprogramma. Verschillen die me bezig hielden en die ik graag beter wilde begrijpen. Niet alleen om dit soort verschijnselen te verklaren maar vooral om handvatten te ontwikkelen om innovatieprogramma’s en innoverende collega’s te ondersteunen. Serendipity, als een toevallige gebeurtenis met een positieve uitwerking, bleek vaker een kenmerk van mijn onderzoek te zijn.

Samen met de collega’s van het innovatieprogramma Maatwerk had ik al een verkennend onderzoekje gedaan naar de belevingen en resultaten van dit 5 jarige programma. Geïnterviewde collega’s en studenten vonden het fijn om hun ervaringen te vertellen. Er kwamen boeiende inzichten boven water, die we vormgaven in een aantrekkelijk boekje ‘Transparant Maatwerk’. Deze gegevens stimuleerden mij om dieper te willen graven. Daarom was ik blij met de gelegenheid die het College van Bestuur mij bood om verder onderzoek te doen. Ook verheugde ik mij op de mogelijkheid om me te bekwamen in iets nieuws. Het was dik 30 jaar geleden dat ik mijn doctoraalstudie andragologie afrondde. Eerlijk gezegd, had ik in mijn professionele loopbaan zelden een wetenschappelijk artikel gelezen, laat staan zelf iets wetenschappelijks ondernomen. Het was echt een uitdaging om de academische wereld binnen te stappen, zowel voor mij persoonlijk, als voor de HBO instellingen, die van de overheid de opdracht kregen om praktijkgericht wetenschappelijk onderzoek te verrichten. De ondersteunende infrastructuur was toen nog in ontwikkeling.

Ik zocht op verschillende universiteiten naar geschikte promotoren, die ik uiteindelijk vond aan de overkant van de straat, bij de Open Universiteit. Mijn interne begeleider bij Zuyd, CVB-lid Jos Willems, leerde mij de mores van de academische wereld met zijn codes, ongeschreven wetten en jargon. De OU, waar de Graduate School nog in oprichting was, bleek een pionier met het begeleiden van buitenpromovendi.

Mijn onderzoek was voor de onderwijsinstellingen zelf ook onderdeel van een innovatietraject.

Onderzoek doen bleek één groot co-creatietraject, voor een omvangrijk deel bestaande uit het aangaan en opbouwen van relaties en samen geschikte wegen zoeken. Tientallen mensen hebben meegewerkt aan mijn onderzoek, niet alleen als deelnemer aan een casus, maar ook als mijn ondersteuner binnen en buiten Zuyd en de OU, in mijn werkkring, vriendenkring en familie. Op de kaft van dit proefschrift zouden ook deze namen moeten staan.

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Terugdenkend zie ik mooie momenten. Zoals het paradijselijke strand van Lanzarote, waar ik, op uitnodiging van Marie-Louise en Jan Kroes, brevierend, de literatuur tot me nam over Sociaal Kapitaal en innovatie. En het restaurantje in de Amsterdamse Jordaan, waar ik Joseph Kessels vertelde over mijn literatuurstudie en dat ik nu echt aan de slag wilde, maar eigenlijk niet wist hoe ik het onderzoek moest aanpakken. Hij adviseerde me Tjip de Jong te benaderen.

Een gouden tip, bleek toen we later samen optrokken. Tjip rondde zijn onderzoek naar Sociaal Kapitaal en kennisproductiviteit af, en ik nam het stokje over, terwijl we samen dezelfde innovatiepraktijk onderzochten. Heerlijk was zijn sprankelend enthousiasme en kostbare ervaring in kwalitatief onderzoek. Ik heb erg genoten en veel van hem geleerd tijdens dat eerste jaar veldonderzoek bij het project 'Limburg Leisure Academy' (LLA).

Dát had ik me voorgenomen, toen ik met dit onderzoek startte: midden tussen de mensen staan. Geen afstandelijk vragenlijstonderzoek óver, nee, participatief onderzoek mét de professionals, samen de processen tot in de kern beleven. Het was fantastisch om dit rijke project van begin tot eind mee te maken. Dank daarvoor, Ria Thomas en Ellen Bijlsma, projectmanagers van dit innovatieproject en Zuyd-collega's. Het was een pioniersproject voor jullie, de betrokken onderwijsinstellingen, Leisure organisaties tussen Maastricht en Sevenum, en de overheid. Een van de eerste 'triple helix' innovaties. Wim van de Coelen, pionier van het eerste uur en projectleider van 'mijn' innovatieteam, dank voor de prettige samenwerking en de ongedwongen sfeer die je creëerde. Anneke Crijns, ik herinner me de heerlijke zeil-

tocht op jouw Sailcenter Limburg, als afsluiting. De band met jullie is er nog steeds. Dank alle deelnemers, dat jullie je belevingen met me wilden delen.

Anne Manders, ook medewerkster bij het innovatieproject Zorgacademie, nodigde me uit om daar vergelijkbaar onderzoek te doen. Zo voegde ik me bij promovenda Uta Roentgen die al vergevorderd was in haar promotietraject binnen het Centre of Expertise voor Innovatieve Zorg en Technologie (EIZT). Met dit nieuwe maatje werkte ik samen om de interviews te analyseren en de rapporten te schrijven. Het liep perfect, ook met de studenten die de interviews afnamen. Veel dank Uta, voor je vriendelijke nauwgezetheid. Leuk, dat we nog steeds vrienden zijn. Emile Curfs, hoogleraar Maatschappelijk ondernemen van Zorgverzekeringen, onze scherpe en gezellige begeleider, ook nu komen we elkaar nog tegen in de zorgsector en delen dezelfde ideeën. Mark Liedekerken, programmamanager, ik bewonderde je om je p.r. kwaliteiten en om je stevige en invoelende leiderschap. Het dubbele predicaat 'beste Europees innovatieproject in de Zorg' in het Europese DART (Declining Ageing and Regional Transformation) en de OESO benoeming als good practice wereldwijd, hebben jullie dik verdiend.

Veel dank ben ik ook verschuldigd aan alle experts van de Co-Creatie-Wiel validatiestudie voor de snelle en onbaatzuchtige medewerking en voor jullie feedback. Het deed mij goed te horen dat het co-creatie-wiel een mooi, bruikbaar instrument is. Een extra woord van dank voor Marjan Vermeulen en Ilya Zitter, voor de interessante literatuur die jullie mij toespeelden.

Naast al deze directe medewerkers aan het onderzoek, introduceerden diverse gremia mij in de wetenschappelijke wereld. Ik deed nieuwe kennis op, ondervond steun en trof 'lotgenoten' aan. Volwassen professionals die naast hun werk een promotiestudie deden. Zoals leden van de kenniskring Innovatief Ondernemen onder leiding van lector Jimme Keizer van Zuyd, en leden van de Design Science Research Group onder de bezielende leiding van Joan van Aken en Daan Andriessen. De CIMO-logica sprak mij, als interventiewetenschapper/andragoloog, zeer aan en stimuleerde mij om het interventie- en ontwerpelement in mijn onderzoek te benadrukken. Ik ben jullie allen zeer erkentelijk voor de inspirerende contacten.

Een bijzondere rol vervulden mijn vroegere studiegenoten, de Amsterdamse andragologen. De oprichting en ontwikkeling van de kring Andragologie, met zijn steeds breder uitwaaiend scala van activiteiten, zette mijn - helaas opgeheven- studierichting weer op de kaart en hielp mij om het andragologisch gedachtegoed toe te passen. Heel veel dank gaat uit naar Henk Wesseling, initiator van deze herleving, en alle andere actieve collegae-andragologen, in het bijzonder Truus Ophuysen en de

helaas overleden Piet Vriens, waarmee ik de interessante interviewronde maakte langs hoogleraren/andragologen, zoals Van Beugen, Kessels, Mulder, Notten en De Zeeuw. Jullie sterkten mij in het gevoel dit onderzoek niet in een vacuüm uit te voeren, maar als een logisch historisch vervolg.

Het gevoel, onderdeel te zijn van een groter geheel, ervoer ik ook door deelname aan internationale conferenties, zoals de Onderwijs Research Dagen in Leuven, België, de conferenties van de University Federation for Human Resource Development, in Porto, Portugal, Brighton en Edinburgh, Engeland, de International Human Resource Management conferentie te Krakow, Polen, de Participative Innovation conferentie te Genk, België, en de internationale seminars Improving People Performance in Healthcare in Utrecht en Social Dynamic of Innovation Networks in Heerlen. Het is een fantastische ervaring om met internationale onderzoekers kennis te delen en geestverwanten te ontmoeten, zoals Valerie Anderson, Julia Claxton, Eva Wuelner, Bob Hamlin en Rob Poell. We hebben ervaren hoe gemeenschappelijk de vraagstukken en oplossingen zijn. Ik ben dankbaar voor deze blik verruimende en Sociaal Kapitaal verrijkende ervaring, en trots op mijn dubbele nominatie voor de Alan Moon Prize voor het beste paper over de koppeling tussen theorie en praktijk van HRD.

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Op ICT- en secretariael gebied had ik veel hulp nodig. Jarenlang verwend door uitstekende managementassistenten, brak me dat op toen ik geen regulier gebruik meer kon maken van de uitstekende diensten van Zuyd Hogeschool. Guido en Kim van de ICT-helpdesk, Eveline, Maartje, Marianne, dank voor jullie digitale en morele steun, ook nog tijdens de laatste twee jaar van dit traject. Mieke Haemers van de OU, fijn dat je, geheel belangeloos, - nou vooruit, voor een doosje Rousseau chocolaatjes-, mijn bewerkelijke manuscript hebt voorbereid vóór verzending naar de beoordelingscommissie.

Els Lücker, 25 jaar geleden hadden we samen tennisles. Wie had toen kunnen denken, dat jij vanuit je eigen bureau het omslag voor mijn proefschrift zou maken? Hartelijk dank voor je pragmatische en creatieve samenwerking. Ik ben heel blij met je ontwerp.

En dan, the close circle around me, gedurende deze enerverende, avontuurlijke tocht.

Op de eerste plaats Truus Ophuysen, mijn studievriendin andragologie van het eerste uur, Amsterdam 1969. Altijd was jij bereid om mijn teksten te 'kuisen', om er mooi Engels of Nederlands van te maken. Je liet niet alleen zinnen beter lopen, maar kortte ook alinea's in of vatte beter samen. En dat scheelt een stuk om de boodschap over te brengen. Je bent een geweldige vriendin.

Sylvia Schoenmakers, wij waren elkaars 'maatjes' op Zuyd en zijn dat nog. Ook op jou kon ik altijd terugvallen, want jouw oplossingen kwamen vanuit dezelfde achtergrond (Mikojel en onderwijskunde). Ook fijn dat je als tweede onderzoeker onze analyse checkte. We zullen vast nog wel vaker samenwerken en zeker samen recreëren.

Joseph Kessels, vanaf de eerste ontmoeting op een landelijk congres, waar jij sprak, was er de herkenning van gelijkgestemdheid. Andragoloog, streekgenoot, liefhebber van klassieke muziek en natuur, bleek later, hoe kon het ook anders. Jouw wetenschappelijke werk werd mijn belangrijkste voedingsbodem. Nee, je werd geen promotor, maar ik kon altijd bij je terecht om advies, of om een tekst te laten lezen. Bij de promotie ben je mijn opponent, eigenlijk een vreemde rol voor iemand die altijd zo constructief feedback levert. Ik ben benieuwd welke boodschap je voor mij in petto hebt.

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Last, but NOT least, mijn wetenschappelijke begeleiders, Els Boshuizen, Marcel Van der Klink, en in een eerder stadium ook Saskia Brand (OU) en Jos Willems (Zuyd). Els en Marcel, jullie zijn een echt team, vullen elkaar aan en steunen elkaar door dik en dun. Het was een luxe om zo intensief en harmonieus begeleid te worden.

Els, jij bewaakte de grote lijnen en keek met een scherpe helicopterview toe. Maar bij definitieve teksten kwamen er minutieuze opmerkingen met potlood geschreven: 'bedoel je misschien? of zou dit ook kunnen?' Altijd het laatste woord aan de pro-

movenda. Jouw vriendelijk en kritisch meedenken was een genoegen. Ook erg fijn dat we in dezelfde levensfase zitten en jij moeder bent van een bijna even oude zoon en dochter. Het kwam slechts zijdelings ter sprake, maar het bindt. Met plezier denk ik terug aan de concerten die we bezochten, zoals van het flamboyante Simon Bolivar Youth Orchestre uit Venezuela, of van barokorkest AD MOSAM. En aan de barbecue in je tuin waaraan ook mijn jonge gast uit Colombia mocht participeren. Jammer, dat dit allemaal is afgelopen nu. Ik wens je nog een lange OU nazomer als pensionada, want je energie en expertise is nog lang niet op.

Marcel, mijn directe begeleider, jij bent een geweldige didacticus met herkenbare andragologische wortels. Ik kwam als academische novice en vertrek nu, dankzij jouw stimulerende en pragmatische aanpak, als PhD. Het is je met glans gelukt om deze eigenzinnige seniora in het academisch gareel te brengen en te houden. Stapje voor stapje, zoals je steeds zei, op jouw opgewekte, opbouwende manier. Heel hartelijk dank voor de intensieve, bijzonder prettige begeleiding. En voor het 'killen van mijn darlings', dat jij met kennelijk plezier deed. Dankzij het contact met jou, die als lector professionalisering en programmamanager onderwijsinnovatie op Zuyd, een deel van mijn vroegere taak 'aan de overkant' overnam, kon ik mijn band met Zuyd loslaten.

Tot slot wil ik alle musici danken die mij, vooral de laatste jaren thuis, begeleidden. Het was een genot om in stille afzondering te werken met op de achtergrond Die Winterreise, gezongen door Stützmann, Bach en Buxtehude uitgevoerd door AD MOSAM, de Lyrische Stücke van Grieg en vooral de Nocturnes van Chopin, maar dan wel gespeeld door Leonskaja.

En natuurlijk dank ik alle wetenschappers wier werken mij geïnspireerd hebben. Het is mooi om te zien dat dit project, aanvankelijk bedoeld om de professionals van Zuyd Hogeschool te ondersteunen, een internationaal bereik heeft gekregen, en ook mij zelf veel heeft geleerd. Niet alleen heb ik de mogelijkheden en beperkingen van de wetenschap verkend, maar ook de mijne. Het doet goed om ook in de derde levensfase lerend en producerend te zijn. De eerste contacten zijn er om de opgebouwde expertise in te zetten in praktijk en wetenschap.

De motor van dit alles was mijn Sociaal Kapitaal. Ook in de toekomst, misschien zelfs juist in de toekomst, zal dit een belangrijke bron zijn om nieuwe wegen in te slaan, sociale, natuurrijke en kunstzinnige. Ik ben dankbaar dat ik velen nog steeds tot mijn vrienden mag rekenen. Want zonder relaties komt weinig tot stand.

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“What would you like to do next?” He asked when my project was terminated.

“I would like to investigate the educational innovation here at Zuyd University, I replied. “Okay, but only in the form of a PhD study” said Karel van Rosmalen, Chairman of the Executive Board of Zuyd University. This is how I started this research journey into innovation practices in educational institutions. Back then, I did not yet know the concept of ‘Social Capital’. I heard from this first time from Professor Joseph Kessels, when he introduced me to a colleague in the garden of Consultancy Kessels & Smit in Utrecht. “Tjip conducts research on Social Capital, the value of relationships”. Immediately I ‘knew’ this could be an explanation for the large differences between the outcomes of innovation practices I had encountered at Zuyd University, as a manager of the university-wide innovation programme ‘Maatwerk’. These discrepancies occupied my mind and I wanted to better understand where these came from. Not only how to explain these phenomena but mainly in order to contribute to the improvement of innovation programmes and to support innovative colleagues. Serendipity, a coincidental event with a positive effect, more often proved to be a feature of my research.

Together with colleagues from the innovation programme Maatwerk I had already undertaken an explorative investigation into the experiences and results of this five-year programme. Interviewed colleagues and students were happy to share their experiences. Fascinating insights surfaced, that we brought together into a booklet ‘Transparent Maatwerk’. These data encouraged me to dig deeper. Therefore, I welcomed the opportunity provided by the Board of Directors to perform further research. Also, I was looking forward to the opportunity to develop new skills. Over 30 years had passed since I finished my degree in the social science specialization of andragology. To be honest, I had rarely read a scientific article in my professional career, let alone undertaken any academic activity myself. It was a real challenge to enter into the academic world, both for myself and for the higher education institutions, which had been commissioned by the Dutch government to conduct practical scientific research. Six years ago, the supporting infrastructure was still in its infancy.

I looked at several universities for suitable promoters, whom I eventually found across the street, at the Open Universiteit (OU). My internal supervisor at Zuyd, CVB member Jos Willems, taught me the ins and outs of the academic world with its codes, unwritten laws and jargon. The Open Universiteit, where the Graduate School was still in development, turned out to be a pioneer in supervising external doctoral candidates. My research formed part of an innovation process in the education institutes as well.

Doing research proved to be one large co-creation process, largely consisting of creating and building relationships and collectively finding appropriate routes forward. Dozens of people have participated in my research, not only as a participant in a case-study, but also as assistant or supporter inside and outside Zuyd University and the Open Universiteit, and in my professional life, friends and family. Their names should also be on the cover of this thesis.

I want to thank everyone very much!! I am very grateful that you have assisted me and helped me through difficult periods. Some I mention by name below, as an example of the many 'buddies' during my quest.

Looking back, I think of beautiful moments, such as on the paradise-like beach of Lanzarote, where I, on the invitation of Marie-Louise and Jan Kroes, read about Social Capital and innovation. And I think of the restaurant in Amsterdam, where I told Joseph Kessels about my literature study and that I really wanted to get started now, but did not really know how to go about with the research. He advised me to approach Tjip de Jong.

A piece of advice that turned out to be 'gold' when we started to work together. Tjip was finishing his research on 'Social Capital' and 'knowledge productivity', and I took over the baton, exploring innovation practices as a team. Inspiring was his sparkling enthusiasm and valuable experience in qualitative research. I thoroughly enjoyed it and learned a lot from him during that first year of field research as part of the 'Limburg Leisure Academy' case.

This was what I had dreamed of doing, when I started this research: to be amidst the people. Not to send around distant questionnaires about issues but to perform participatory research with the professionals, collectively experiencing the process of innovation to the core. It was brilliant to experience this rich project from beginning to end. Thank you, Ria Thomas and Ellen Bijlsma, project managers and Zuyd-colleagues. It was a pioneering project for you, for the schools in question, the involved Leisure associations and the government. One of the first 'triple helix' innovations. Wim van de Coelen, pioneer of the first hour and project leader of 'my' innovation team, thank you for the pleasant collaboration and the relaxed atmosphere you created. Anneke Crijns, I remember the wonderful sailing trip at your Sailcenter Limburg, as a concluding event. The bond with you is still there. Thanks to all the participants for sharing your experiences with me.

Anne Manders, also colleague at the innovation project 'Zorgacademy', invited me to do similar research over there. I joined PhD student Uta Roentgen who had al-

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ready progressed in her PhD programme within the Centre of Expertise for Innovative Care and Technology. With this new buddy I worked together analyzing the interviews and writing reports. It worked perfectly, also with the students who did the interviews. Uta, thank you for your kind conscientiousness. Nice, that we are still friends. Professor on Healthcare Insurance, and friendly and sharp supervisor Emile Curfs, we still meet each other in the healthcare sector and continue to share ideas. Mark Liedekerken, programme manager, I admire your PR qualities and your firm and empathetic leadership. The designation of best European and worldwide innovation project in 'Declining Ageing and Regional Transformation' (DART) is well deserved.

I am also indebted to all the experts of the Co-Creation-Wheel study for the quick and selfless collaboration and for your feedback. It encouraged me tremendously to know you assessed the Co-Creation-Wheel as a beautiful and useful instrument. Extra thanks for Marjan Vermeulen and Ilya Zitter, for the interesting literature you gave me.

Besides all these direct participants, several groups introduced me to the world of science. I gained new knowledge, experienced support, and found 'buddies', mostly adult professionals, who did a PhD study alongside their job. These include members of the expertise group 'Innovative Entrepreneurship' led by professor Jimme Keizer from Zuyd University and the members of the 'Design Science Research Group' under the inspiring leadership of professor Joan of Aken and Daan Andriessen. The CIMO-logic highly appealed to me, as intervention scientist/andragologist, and encouraged me to emphasize intervention and design elements in my research. I am very grateful to all of you for the inspiring moments of contact.

My former classmates, Amsterdam andragologists, fulfilled a special role. The creation and development of the 'Alumnikring Andragology', with its ever-wider range of activities, put the - unfortunately cancelled - social science discipline back on the map and helped me to apply the andragological school of thought. Many thanks go out to Henk Wesseling, initiator of this revival, and all other active colleagues-andragologists, especially Truus Ophuysen and the unfortunately deceased Piet Vriens, with whom I conducted interesting interviews with andragology professors such as Van Beugen, Kessels, Mulder, Notten and De Zeeuw. You strengthened me in the conviction conducting this research as a logical historical continuation.

The feeling of being part of a greater whole, I also experienced by participating in international conferences, such as the Education Research Days in Leuven, Belgium; the conferences of the University Federation for Human Resource Development, in

Porto, Portugal, Brighton and Edinburgh UK; the International Human Resource Management conference in Krakow, Poland; the Participative Innovation conference in Genk, Belgium and the international seminars Improving People Performance in Healthcare in Utrecht and Social Dynamic of Innovation Networks in Heerlen, the Netherlands. It was a wonderful experience to share knowledge with international researchers and meet like-minded spirits, like Valerie Anderson, Julia Claxton, Eva Wuelner, Bob Hamlin and Rob Poell. We have experienced the commonality of issues and solutions. I am grateful for these viewpoint expanding and Social Capital enriching experiences, and I am proud of my double nomination for the Alan Moon Prize for the best paper about linking theory and practice of Human Resource Development.

I am also grateful for the opportunity to give workshops and lectures about my research topics in several places throughout the Netherlands. Many thanks go out to the editors of the Journals 'Develop' and the 'Tijdschrift voor Sociale Interventie' and the Kring Andragology for the invitation to publish on Social Capital and co-creation. The experience to offer something to other professionals provides a great incentive to persevere.

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background (education science). Great that you, as a second researcher, checked our analysis. We are likely to work together again in the future and will most certainly recreate together.

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Marcel, my daily supervisor, you are a great didactic, with recognizable andragological roots. I arrived as a novice academic and depart now, thanks to your stimulating and pragmatic approach, as Ph.D. You managed to bring this strong-willed senior(a) into the academic harness. Step by step, as you always said, with your cheerful, uplifting way. Thank you very much for the intensive, very pleasant guidance and for

'killing my darlings', which you did with seemingly pleasure. Thanks to the contact with you, who took partly over my former role 'on the other side', as a lecturer and program manager professional educational innovation at Zuyd University, I could let go of my 30-years commitment with Zuyd University.

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The engine of all this was my Social Capital. I am grateful that I can still count many as my friends. In the future, perhaps especially in the future, this Social Capital will be an important source for new journeys, both socially, artistically and in nature.

Because without relationships little is to be achieved.



Participants of Projects and Studies

Participants of the project 'Limburg Leisure Academy'

Colleges/University

Arcus college, College Rolduc, Charlemagne college, Da Capo College, ROC Gilde, Cita Verde college, College Stella Maris, Valuascollege, Leeuwenborgh Opleidingen, Zuyd Hogeschool.

Businesses

Industrion, Recreatiepark de Schatberg, Toverland, Gaiapark, Sailcenter Limburg, Center Parcs, Marina Oolderhuske, Recreatiepark de Berckt, Klein Zwitserland.

Members, project management and steering committee

Anita Janssen, Anneke Crijns, Ellen Bijlsma Uitterhoeve, Els Meys, George Jacobs, Gilbert Heijnen, Guus Morjan, Hans Hoppzak, Hans Houben, Hans Nicolaes, Harrie de Rooij, Inga Persson, Jacques Knelissen, Jan Maijntz, Jan van Nierop, Jan Paulissen, Jeanette Creusen - te Wechel, Jeroen Janssen, Joop Hoevers, Maïke Camp, Manon Elemans, Mark van Rensch, Ria Thomas, Ron Martens, Ruud Schillings, Suzanne Zanetti - Tacken, Tanja Peters, Thea Hamers, Thijs Vossen, Vera Geebelen, Wiel Spreeuwenberg, Wim van der Coelen, Wim Weijers.

Participants of the project 'Zorgacademie' (Care Academy)

College/ Universities

Arcus College, Hogeschool Zuyd en Open Universiteit.

Businesses

Atrium Medical Center, Mondriaan en Sevagram.

Members and project management

Albert Kampermann, Alice Gorissen, Bart van Dolderen, Diana van Trigt, Frans Schoonbrood, Frits Kluijtmans, Harry Vaessen, Ingrid Stotijn-Claessen, Jo Geesink, Kees Pannekeet, Khaled Zamani, Luc de Witte, Marco Ortu, Mark Liedekerken, Patty Blijlevens, Paul van Putten, Rene Claassen, Ria Thomas, Shoeli Liem, Ton Pagen, Toon van Baal, Uta Roentgen.

Experts Co-Creation-Wheel study

Alice Gorissen, Anneke Crijns, Harry Vaessen, Ilja Zitter, Marcel Weber, Marjan Vermeulen, Mark van Rensch, Marloes de Jong, Miriam Goes, Piet Van den Bossche, Sylvia Schoenmakers, Tim Schadenberg, Tjip de Jong, Wim van der Coelen.

Co-researchers

Emile Curfs (bijzonder hoogleraar Maatschappelijk ondernemen door Zorgverzekeraars), Sylvia Schoenmakers (adviseur onderzoek Zuyd Hogeschool), Tjip de Jong (indertijd promovendus Universiteit Twente), Uta Roentgen (indertijd promovenda Universiteit Maastricht), Maartje Henderikx (onderzoekassistente), Gwendolyn, Evelyn en Jessica (studenten Zuyd Hogeschool).



Curriculum Vitae

Corry G.J.M. Ehlen (Sittard, the Netherlands) completed grammar school and obtained a Bachelor degree Social – Cultural Work. In 1975 she graduated from the University of Amsterdam, where she studied Andragology and specialized in adult education and organizational development.

For most of her professional life she focused on adult education, professional training/education, curriculum development and organizational innovation. From 1972-1975 she worked as trainer, supervisor and coordinator in vocational education. From 1975-1999 she was a lecturer in social science in higher education. As a curriculum developer she designed several new educational streams in areas of social and cultural work. From 1981 – 1991 she was coordinating director.

On the international level she was for five years (1990-1995) the program manager of a European TEMPUS project for curriculum development at the University of Bucharest (Romania) and participated in several transnational collaboration projects.

From 1999 – 2008 she worked as a policy advisor ‘education, research, and corporate strategy’ for the board of governors at the Zuyd University, which is a merger of seven independent regional institutions for higher education. In her capacity of program manager she designed corporate innovation programs, developing and implementing new educational strategies at the newly formed Zuyd University.

Her PhD study at the Open Universiteit focuses on supporting professionals involved in large-scale educational innovation programs, applying and extending ‘Social Capital’ theory and concepts such as ‘co-creation’.

As a member of the Dutch NGO for senior international experts (PUM), she is currently working as an advisor and trainer at universities in Rwanda, Vietnam and Colombia. Recently she developed a co-creation project between universities and industries in Colombia. She is a trainer of PUM-experts in ‘intercultural advising’.

As partner of Co-Creata Consulting, she is a consultant, trainer and researcher in the Art-, Health-Care and Educational sector.

Corry Ehlen is mother of Jérôme and Cathérine Delnooz and foster mother of Jerome Irankunda, Rwanda.

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Nomination for the Alan Moon Memorial Prize, best conference paper

- Ehlen, C.G., Van der Klink, M., Boshuizen, H.P.A. (2012). The contribution of Social Capital to organizational innovation: an exploratory longitudinal study. *Proceedings of the 13th International Conference of the University Forum for Human Resource Development (UFHRD), 2012*. Villa Nova de Famalicao. Portugal.
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Increasingly, the concept of 'co-creation' becomes internationally recognized as a leading innovative approach for regional collaboration between education, industry and government.

Quite often, inter-organisational collaboration is a matter of trial and error and many projects produce disappointing results.

This study unravels the complex processes of two large scale inter-organisational innovation programmes. 'SOCIAL CAPITAL' is found to be the engine of innovation. Trustful relations, collective expertise, and courageous actions rather than purely structure, prove to be successful mechanisms.

The 'CO-CREATION-WHEEL', as a key practical result of this study, presents 12 factors for successful innovation through co-creation. The instrument provides a stimulating guideline for innovators and practical lessons for HRD professionals and managers.

