Mechanisms of Self-leadership in Entrepreneurial Teams

Abstract

Fast changing and highly dynamic global markets confront contemporary entrepreneurial teams with technologically complex and markedly uncertain situations. Entrepreneurship Centres undertake enormous efforts in their attempts to develop entrepreneurial teams for demanding innovation attempts. In this respect, the quality of social interactions of entrepreneurial teams is considered to be a crucial dimension for entrepreneurial team effectiveness and success. A frequently used instrument to facilitate the innovation process and the quality of social interactions is prototyping built on the concept of shared mental models.

In a comparative case study, this work evaluates the teamwork of two entrepreneurial teams in an entrepreneurial team development programme by adopting the concept of effective teamwork mental models for self-managing work teams. It is argued that this concept is more comprehensive and especially suitable for the teams researched because it takes also the content of shared mental models into account.

By means of this concept, a qualitative research paradigm and a context-mechanism-phenomena conceptualisation, this work discovers the team phenomena present in both cases and explains the phenomena that are discovered by identifying the underlying mechanisms that have causally generated these phenomena. Eight mechanisms:

(1) Time and Support
(2) Leadership
(3) Democratic Processes
(4) Convergent Values and Attitudes
(5) Trust
(6) Target Attractiveness
(7) Double Loop Learning
(8) Friendship

are empirically discovered and synthesised into a concept of enhanced entrepreneurial teamwork quality. In this manner, this project provides empirical evidence about possible ways to enhance the quality of entrepreneurial teamwork.

The content of "Mechanisms of Self-leadership in Entrepreneurial Teams" is based on the unpublished master thesis: Keuscher, T. (2007): Phenomena of social interaction in entrepreneurial teamwork, Lancaster University Management School.

Introduction

Innovation as the specific instrument of the entrepreneur and an act that endows resources with a new capacity to create wealth (Peter Ducker 1985), is predominantly about recognising and enforcing entrepreneurial opportunities. Although this definition of innovation is still valid in the present day, there is a noticeable shift in its approach. The act of innovation is, fuelled by the fast changing and dynamic growing global markets, getting more and more complex (Ardichvili, 2003). These high levels of complexity in turn result in high levels of uncertainty about markets and opportunities (Pearson, 1990), putting extremely high demands on contemporary entrepreneurs.

Since these extremely high requirements can hardly be met by one single individual any more the different but complementary capabilities and skills of individuals have to be combined and bunched, and external resources have to be considered. As a result, designers, innovators and entrepreneurs find themselves more and more often working together in teams, taking external knowledge sources like customer feedback into consideration (Lechler and Gemünden 2003).

In order to operate successfully in this highly dynamic, complex and uncertain environment, entrepreneurial teams have to find a way to work together as effectively as possible and as fast as possible, which is *dependent on the quality of their social interactions*. An early development of a high quality of entrepreneurial teamwork (understood as the social interactions of entrepreneurial teams) is therefore crucial for a successful operating team, but difficult to achieve.

Research Background and Objectives

Universities are considered to be a particularly rich source of technological novelties and young entrepreneurs. No less than 1600 universities offer 2200 entrepreneurship courses. There are at least 277 endowed faculty positions and 44 refereed entrepreneurship journals and over 100 established and funded entrepreneurship centres offering resources, consultancy, and guidance to entrepreneurs with pedagogical opportunities for students (Katz, 2003). These institutions undertake enormous efforts to sensitise and support scientists and students in the early stages of entrepreneurial team development. However, selective measures for the support and development of effective entrepreneurial teams are apparently not available (Doll, 2007).

Since previous research has, in relation to entrepreneurial teamwork, largely been focussed on describing the social interactions in entrepreneurial teams with input-output concepts (Doll, 2007), a research community at the Centre of Entrepreneurship of a leading German University is in pursuit of a different approach. They are researching the effects of Prototypes (Experimental Models) on the social interactions of entrepreneurial teams within an entrepreneurial teamwork development programme.

This background and a current lack of empirical validation for entrepreneurial team formation and functioning (Cooper and Daily, 1997) is the basis for an international cooperation project between the above mentioned Centre and the Department of my current university that is researching 2 different Cases of entrepreneurial teamwork within the above mentioned programme with the following objectives:

(1) *To discover and understand the Phenomena of Social Interaction within an Entre preneurial Team Development Programme.*

(2) *To explaining the occurred Phenomena of Social Interaction within this Pro gramme.*

Structure of the Paper

With the aim of achieving these research objectives this work is structured as follows:

Chapter 2 provides the necessary theoretical background for the project and will explain Entrepreneurship, Innovation, Prototyping and Shared Mental Models as the underlying concept of Prototyping. This chapter will conclude by providing a theoretical core concept for the work:
The Concept of Shared Mental Models for Effective Self-managed Work Teams.

Chapter 3 has the objective of explaining the underlying research philosophy and reasoning approach of this work: *Critical Realism and Retroductive Reasoning*. The research philosophy determines the structure of all the following, including research design, data analysis, reasoning approach and conclusion.

Chapter 4 will present the research design including sampling method, methods of data gathering, process of data gathering and method of data analysis. Chapter 4 further explains why a C*omparative Case Study* has been chosen as a suitable approach.

Chapter 5 represents the empirical part of this work and presents the findings of 4 in-depth interviews conducted. The findings represent the teamwork related phenomena discovered for the 2 Cases. Through the adoption of the theoretical core concept, meaningful themes will emerge which will act as the basis for the in Chapter 6 following development of their underlying mechanisms.

Chapter 7 will summarise and conclude the results of this project, give practical recommendations, discuss its limitations and eventually provide implications for further research. And the final Chapter 8 will critically reflect on the whole work.

Literature Review

Introduction

In order to understand and explain phenomena of entrepreneurial teamwork, it is crucial to grasp the subject's theoretical origins. Hence the aims of this chapter are to provide the necessary theoretical background with regards to the research focus and to develop an appropriate theoretical lens with which this project can be viewed through. On this account it first gives a historical overview of the fields of entrepreneurship and innovation.

As mentioned in the Introduction, entrepreneurial (or innovative) projects can, due to high levels of complexity and uncertainty, barely be handled without teams and the quality of teamwork (defined as the social interactions of team members) is crucial for a projects' success. Yet these teams use Prototyping as a tool to foster innovations. Prototyping is built upon a concept of shared mental models. Because of the importance of this concept for this study, this chapter then briefly reviews the latest developments in shared mental model theory and finally adopts a more comprehensive version of the concept of shared teamwork mental models. This core concept is then used to make sense of the phenomena of teamwork discovered in Chapter 5.

Managing the Unknown with Entrepreneurship

The notion of entrepreneurship goes back to the eighteenth century and its body of research: *"is stratified, eclectic, and divergent"* (Murphy, Liao and Welsch 2006, p.1). Since the 1700s its evolution was accompanied by a vast amount of discussion; partly complementing, partly conflicting frameworks allegorising a strong academic field of interest (see Chapter 1). Hence, one can find many different theories and definitions for entrepreneurship. With respect to the existing literature, the following paragraph briefly gives a chronological overview of some widely respected and influential scholars within this field and their perspectives on entrepreneurship:

Richard Cantillon (1755) defines entrepreneurship as the 'self-employment of any sort' and said that entrepreneurs buy at certain prices in the present and sell at **uncertain** prices in the future. According to Cantillon, the entrepreneur is a **bearer of uncer**

tainty. Interesting in Richard Cantillon's perspective on entrepreneurship is his early notion of uncertainty.

In 1912 Joseph Schumpeter defined the entrepreneur as: 'The innovator who **implements change** within markets through the carrying out of new combinations.

Likewise to Cantillon, Frank Knight's (1921) notion of market uncertainties is a central element of his understanding of entrepreneurship: 'The entrepreneur attempts to **predict and act upon change** within markets'. For him entrepreneurs are furthermore required to perform such fundamental managerial functions as direction and control.

In ‘The Theory of the Growth of the Firm’, Edith Penrose (1963) explains that entrepreneurial activity involves identifying opportunities within the economic system and like Schumpeter she argues, that managerial capacities are different from entrepreneurial capacities.

Harvey Leibenstein (1968), an American economist, contended that the entrepreneur fills market deficiencies through input-completing activities: ‘Entrepreneurship involves activities necessary to create or carry on an enterprise where **not** all markets are **well established or clearly defined** and/or in which relevant parts of the production function are not completely known.’ Interesting is his notion of the unknown, deriving from aforementioned uncertainties entrepreneurs have to deal with.

‘The entrepreneur recognises and acts upon market opportunities and is essentially an arbitrageur.’ Israel Kirzner (1976) view is contrasting to Schumpeter’s perspective. Instead Kirzner states that the entrepreneur moves the market **toward equilibrium**.

In ‘The Entrepreneur: An Economic Theory’, Mark Casson (1982) describes the essence of entrepreneurship as: **Being different** - Being different because one has a different perception of the situations. The entrepreneur is described as an intermediator, intervener and as a person whose judgements differ from the judgements from others.

In his work: Innovation and Entrepreneurship: Practice and Principles, Peter Drucker (1985) defines entrepreneurship and the entrepreneur as: ‘**Always searching for change, responding to it** and exploiting its opportunity’ **by the means of innovation**.

William Gartner (1988) entitled his work: ‘Who is an entrepreneur? is the wrong question!’ He argues that entrepreneurship is the creation of organisations. What differentiates entrepreneurs from non-entrepreneurs is in his opinion is that those entrepreneurs create organisations, while non-entrepreneurs do not.

Deriving from the above perspectives, entrepreneurship is described, from a management viewpoint, as a function involving the exploitation of market opportunities. This exploitation of market opportunities again frequently requires a productive input realised through product innovations. In order to realise innovations entrepreneurs often have to take risks, to operate in unknown fields and to deal with high levels of com-

plexity and uncertainty. During their entrepreneurial activities, entrepreneurs also have a managerial role which shows that the entrepreneurial function is also changing. Schumpeter inter alia already emphasised the importance of innovation by distinguishing between five different types of innovation: new products, new methods of production, new sources of supply, the exploitation of new markets and new ways to organise business. Ducker similarly describes innovation as the central instrument in entrepreneurship stating that: *"Innovation is the act that endows resources with a new capacity to create wealth."* (Drucker 1985, p. 27). Hence the following paragraph deals with the subject of innovation as an inextricable and central element of entrepreneurship.

Building the Unknown through Innovation

Introduction

The term innovation derives from the two Latin words **novus**, which means new and **innovatio**, which means to re-create something, and describes a new creation. It should not be confused with invention inasmuch that: *"Invention is the first occurrence of an idea for a new product or process, and innovation is the first commercialisation of this idea"* (Fagerberg, 2000, p.9). In addition Rogers (1995) points out that in order to turn an invention into an innovation an organisation needs to combine several different types of resources like knowledge, raw materials and skills. Kline and Rosenberg (1986) furthermore add that an innovation is a continuous process. Among the vast amount of definitions for innovation the one below describes innovation as:

> *"Innovation is the successful exploitation of new ideas and is a vital ingredient for competitiveness, productivity and social gain within businesses and organisation.'* (London Innovation, 2003 in Davidson and Blackman, 2005)."

However, one must ask whether entrepreneurs would rather focus on how to innovate and how to foster and manage innovation. Several scholars have given descriptions, or better prescriptions as to how this should be done. In particular, the earlier work of Leibenstein, Kirzner or Schumpeter considered the entrepreneur to be the central figure and thus held an individually-driven perspective, proposing rigid frameworks. Having said this, contemporary work often shifts away from this traditional, endoge-

nous view on entrepreneurship and moves on to a rather exogenous, organisational and network emphasised perspective with a focus on customer integration and social aspects (von Hippel, 1988, 2005).

A first step toward an understanding of innovation is to enhance understanding of the different underlying innovation models that have emerged over time. Thus the following section has the objective to discuss a selection of some widely respected concepts.

Innovation Concepts

Many theorists have broken down innovation into phases or stages, using for instance tripartitions like Utterback (1971), who developed a model comprising three phases which he named: **idea generation, problem solving and implementation and diffusion**. His model was extended by Goldhar (1974) and once again expanded by Abernathy and Utterbeck in 1978 inasmuch as they again defined three innovation phases: **the fluid, the transitional and the specific phase**. Their analysis was one of the most comprehensive ones, covering nearly all of Schumpeter's categories of innovation.[2]

Like Abernathy and Utterback (1978), Crawford (1994), Kleinschmidt and Cooper (1991) and Wheelwright and Clark (1992) developed threefold classifications. Crawford's categorisation outlined pioneering, adaptation and imitation which shares similarities with Kleinschmidt and Coopers' categorisation of low, medium and high degrees of innovativeness, which are in turn reflected in Crawford's **New Product Charta**, including different degrees of **inventiveness thought**, which describes degrees of novelty or radicalness. Crawford's (1980) notion is again closely related to Ansoff's and Stewart's classification into; **first to market, follow the leader, application engineering and me-too** (1967).

Corresponding with these categorisations, Tushman and Nadler (1986) also defined three types of innovation: **incremental, synthetic and discontinuous innovation**, emphasising the different degrees of learning requirements. Tushman and Nadler's notion of discontinuous innovation is revisited by Lee and Na (1994) who distinguish

[2] For a more comprehensive overview compare Abernathy and Utterback's (1978): Patterns of Inno vation in Technology. According to Abernathy which emphasised the flowing nature of innovation and Utterback arguing, the older a firm gets the more it changes its focus on innovation.

between **incremental improving** and **radical innovativeness**. Their study shows that the existence of a champion is critical if the innovativeness is radical but that radicalness does not affect relationships. Information acquisition during the idea generation stage is considered as important for radical and incremental improvement projects.[3]

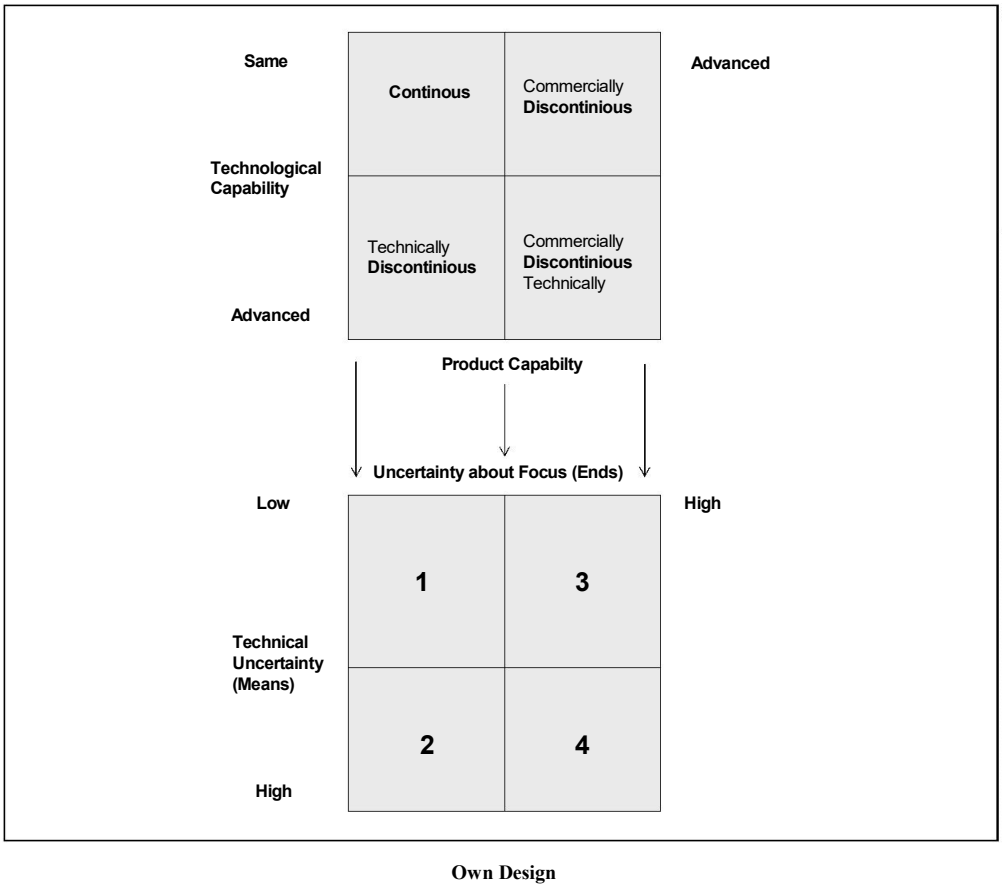
Nystroem's (1985) product development strategy contains a **product** and a **process** dimension, transferring technology and marketing strategies into technology and marketing outcomes. He also emphasises the **degrees of novelty** that companies have to employ to be more or less innovative. This coincides with Meyers and Tucker (1989) who hold a further twofold view on product development and commercialisation.

It must be noted that the above discussion is not exhaustive. Nevertheless, it has demonstrated that most innovation models consist of several phases or stages and prevalently include a technological-product dimension as well as a commercial-marketing dimension. Moreover an innovation's **degree of novelty or radicalness** is apparently of further importance, which determines its **continuous** or **discontinuous** character. Veryzer's (1998) model captures these characteristics, and in combination with Pearson's (1990) **uncertainty map** they provide a useful framework for a classification.

The combination of Veryzer's and Pearson's models (Figure 1) demonstrates that, in addition to the in contemporary markets prevailing high levels of complexity (Ardichvili et al. 2003, Buenstorf 2007, Lichtenstein et al. 2007), particularly discontinuous innovation projects are confronting innovators and entrepreneurs with high levels of uncertainty additionally (see Thomke 2003). The difficulty for individual entrepreneurs to cope with these high levels of complexity and uncertainty frequently results in the formation of interdisciplinary entrepreneurial teams, in which these different capabilities are being combined (Teach 1986, Picot 1989, and Dreier 2001).

[3] Compare also Lisa de Propris (2002). Her model distinguishes between four different types of in novations: product, process, incremental and radical innovations. The model builds on two of Schumpeter's 1912 identified five forms of innovation: product and process and distinguishes be tween improvement and novelty. According to this model, an incremental innovation thus com prises the improvement of product and process, a product innovation a new product and an im proved process, a process innovation a new process and an improved product and a radical innova tion both, new product and process.

Figure 1: Combination of Veryzer (1998) and Pearson (1990)



Developing Entrepreneurial Teams with Prototyping

The question remains how entrepreneurial and innovation teamwork can be fostered. Further outcomes of innovation and design research projects have shown that prototyping[4], understood as a tool of the systematic testing of experimental models, is not only beneficial for the development of innovative products but is also influential on

4
The prototype is a haptic model, illustrates ideas or features and enables designers to gather early user feedback. Prototyping is often treated as an integral part of the innovation process, where it is elieved to reduce risk by reducing complexity and uncertainty. Often one or more prototypes are made in an iterative process of creative and incremental development where each prototype is influenced by the performance of the previous designs. In this way problems or deficiencies in design can be corrected early on and improved. When the prototype is sufficiently refined and meets the functionality, robust ness, manufacturability and other design goals, the product is ready for prodution. For a more comprehensive explanation comp. Tai G. (2005), Kelley (2001).

social behaviours of the designers who use it (comp. Harel and Papert 1991, Cross and Cross 1995, Erickson 1995, Mascitelli 2000, Star 1989, Kelley 2001, Tai 2005).
The underlying assumption of the Prototyping Concept is that prototypes (haptic models) help individual team members to physically reproduce their mental models, and hence stimulate and foster team communication and other dimensions of the social interaction. In this respect, prototypes facilitate the alignment of individual mental models and foster the development of shared mental models which are considered to be crucial for individuals to effectively and successfully work together in a team (Mathieu, J, Goodwin G. F., Heffner T. S., Salas E., and Cannon-Bowers J. A., 2000).

The significant usage of Prototyping as a tool in entrepreneurship, innovation and design practice (Kelly, 2002), reflected in the programme researched, and in conjunction with the importance of shared mental models as their underlying concept determines shared mental models as to be the core piece of this literature review. This concept is taken as the lens, through which the outcomes of this research are being understood. The following part will thus explain this concept and thereafter provide a useful framework with which the results of this project can be grasped and explained.

Given that the quality of social interaction in entrepreneurial teams is crucial for an entrepreneurial team to work effectively and that Prototyping has an influence on social behaviours the question must be raised about whether Prototyping not only fosters the development of innovative products and entrepreneurial chances (see Thomke 1998, Sull 2004) but entrepreneurial teamwork likewise (Högl and Gemünden, 2001).

Due to its importance for Prototyping, the following section is explaining the concept of Shared Mental Models.

Shared Mental Models

Mental models are an explanation of someone's thought processes of how something works in the real world. They are considered to be a part of cognition theory and are

applied in different academic fields, like psychology, sociology or education, respectively. An important presumption of this concept is presented in the below definitions:

> *"Cognitive systems construct models of the problem space that are then mentally run or manipulated to produce expectations about the environment."*
> (Holland, 1986, p.12)

> *"Thus mental models are internal representations that individual cognitive systems create to interpret and interact with their environment."*
> (Denzau et al., 1994, p.4)

As Holland and Denzau state, mental models help individuals in interpreting behaviours, drawing inferences, recognising relationships, making predictions or understanding phenomena (Johnson-Laird 1983). Accordingly, they allow individuals to decide which behaviours and actions are appropriate to take.

The concept of Shared Mental Models has been used to explain team functioning for several years. By defining the causal connections and working models that are collectively constructed by team members in order to calculate the consequences of potential actions they have been used to explain **why specific team outcomes materialise**. It has been argued that an **overlap** in individual **team member mental models** is influencing team work positively (Mathieu et al. 2000). Rephrased socially this means, that these overlapping individual mental models (or shared mental models) are socially constructed cognitive structures, representing shared knowledge or beliefs about a system (environment) and its expected behaviour (Druskat and Pescosolido, 2002). In this sense shared mental models enable individuals to anticipate other team members' actions and needs, which is particularly important when teams are interacting in highly complex, uncertain and hence situations which are difficult to anticipate.

In this sense shared mental models are not team norms but are the antecedents to team behaviours which in turn are the antecedents to team norms (Druskat and Pescosolido

2002). Research on shared mental models and teams has predominantly focused on the positive relation between the level of model convergence and team effectiveness, arguing that the higher the convergence the more effective a team (comp. e.g. Canon-Bowers et al., 1995). It was prevailing task-oriented in such a way, that shared mental model theory has tried to explain how teams can cope with difficult changing task conditions by quickly adjusting their team strategies (Canon-Bowers et al., 1995).

With respect to this work, which reinforced the argument that overlapping and strong shared mental models are of vital importance for team effectiveness (Mathieu, 2000), some cases have shown, that teamwork had have unsuccessful outcomes, despite the fact that team members apparently had shared such strong models (comp. Davison and Blackman, 2005). Theorists are debating if not only the degree of overlap of shared mental models but also their contents are of considerable importance (Druskat and Pescosolido 2002, Davison and Blackman, 2005). These developments lead to the hypothesis that previous attempts to make practical use of this concept, based on the above mentioned assumptions, are possibly para the degree of **share** or **overlap** (their strength) and the **type** of models lacking to take further dimensions, like their **contents** into account and were thus assumingly lacking comprehension.

Mathieu et al. (2000) have identified three different types of shared mental models: **equipment models**, **task models** and **teamwork models**. Their research had indicated that teamwork models are more directly linked to team performance than for example task models. By exclusively focusing on teamwork models, Druskat and Pescosolido[6] discovered three shared mental models for effective self-managed work teams:

[6] Druskat and Pescosolido (2000) were the first to make the distinction of different model types. They did this by undertaking a thorough content analysis of five theories of self-managed work teams effectiveness in order to identify the most important shared mental models for team effect tiveness. Following this they then undertook a second content analysis of four longitudinal studies of self-managed work teams to search for practical evidence and to use this data to verify the re sults of their first analysis

1) A Need for Psychological Ownership[7] of Team Processes and Outcomes
2) A Need for Continuous Learning
3) A Need for Heedful Interrelation

Psychological Ownership has found to be a state of mind which changes ones relationship to the work by increasing feelings of responsibility for, influence on and pride about work. In this vein high psychological ownership enhances the effort for extra role activity that facilities team effectiveness and is crucial for self-managed teams.

A Need for Continuous Learning stems from the need that self-managed teams have to operate in a complex and uncertain environment where they have to engage in complex decisions, self-evaluation and self-correction. A shared mental model of continuous learning would foster team learning and development and all team members would constantly seek for knowledge and feedback and share this with the team.

A shared mental model for **Heedful Interrelation** proposes that the more heed is reflected in interactions between team members and between team members and their environment, the greater is the team's ability to reduce process errors and to adapt to occurring needs and unexpected events. Members would understand that their actions rely on connected actions. Such a model would drive and encourage team members to maintain good relationships, for instance through appropriate communication.

Druskat's and Pescosolido's analysis of four longitudinal studies of self-managed work teams has revealed the following indicators for the shared content models above:

[7] Psychological ownership is understood as the psychologically experienced phenomenon in which an individual develops possessive feelings for a target (Dyne and Pierce, 2004). Pierce et al. (2001) theorised that psychological ownership can be differentiated from other constructs based on its conceptual core (possessiveness) and motivational bases. They argued that psychological own ership satisfies three basic human needs: home (having a sense of place), efficacy and effectance, and self-identity. When employees experience psychological ownership, they are able to satisfy these basic needs. The psychology of possession identifies three fundamental outcomes associated with feelings of possession: positive attitudes toward the target, enhanced self-concept, and a sense of responsibility. Dyne and Pierce (2004) furthermore argue that psychological ownership is key to work-related attitudes (commitment and satisfaction), self-concept (organizational-based self-esteem), and behaviours (performance and organizational citizenship).

1) Psychological Ownership: **High levels of Commitment and Participation**
2) Continuous learning: **A serious Approach to and Interest in Learning**
3) Heedful Interrelation: **Attentive, Purposeful, Conscientious Behaviour**

The fact that all entrepreneurial teams within this programme work in a self-managed way in combination with the aim of this project: To understand and explain their teamwork phenomena, makes the work of Druskat and Pescosolido particularly relevant for the project. As their more comprehensive concept is adopted, it provides the necessary framework to make sense of the phenomena being discovered by means of Pawson and Tilley's Context-Mechanism-Phenomenon Conceptualisation (Chapter 5).

Research Philosophy

Introduction

So far, Chapter 2 has provided the necessary theoretical framework with regards to the research focus and has developed an appropriate theoretical lens with which the phenomena and contexts of this project can be understood.

Teams consist of beings and the objective of this study is to gain knowledge about entrepreneurial teams and their work. However, the knowledge that can be gained about beings is highly complex and causalities are often beyond observable and tangible facts and located within these entities (Sayer, 2004). Consequently, the knowledge that can be gained, can be interpreted differently and have ambiguous outcomes. This implies that a researcher's perception of reality influences his understanding of the knowledge gained, and the ways in which it is analysed and interpreted. The way in which a researcher apprehends reality represents their ontological standpoint and the way how a researcher gains knowledge represents their epistemological standpoint. Together they constitute the Research Philosophy (Burrell, 2001).

According to Easterby-Smith et al (2002) and Saunders et al. (2003) a social researcher has thus to define their research philosophy and specify their underlying assumptions in order to explain the view of the world they are researching. Before the research philosophy of this particular project is determined the paragraph below gives a brief overview of the main philosophical standpoints that researcher can adopt.

Traditional Debates

There are four major debates, which have dominated the history of social science over the past several hundred years. These are the ontological, the epistemological and the methodological debate and the debate about human nature. Each of these implies two extreme positions. Each position in turn implies its own underlying assumptions:

> *"...which concerns the very essence of these phenomena under investigation."* (Burrell, 2001, p.1)

The ontological debate occurs between Realism and Nominalism. Realists believe the social world exists independently of an individual appreciation of it. It exists prior to the human being, which is just born into it, and which has no ability in creating it. In this sense, 'Realists' believe that the social world is made up of hard, tangible and relatively immutable structures. Nominalists, in contrast, believe the social world is nothing more than a set of names, labels and concepts which structure reality (a product of individual consciousness). These represent two extreme positions: One apprehending social world objectively and the other subjectively: Objectivism versus Constructivism (Burrell, 2001; Denzin and Lincoln, 2005).

The epistemological debate is situated between Positivism and Interpretivism. Positivists regard knowledge as something that is capable of being transmitted into tangible form. They seek to explain what happens in the social world by searching for realities and causal relationships (Burrell, 2001; Denzin and Lincoln, 2005). Anti-Positivists or Interpretivists believe, that *"the social world is relativistic and can only be understood from the point of view of the individuals who are directly involved in the activities which are to be studied"* (Burrell 2001, p. 5). Knowledge is seen *"as a softer, more subjective, spiritual or even transcendental kind, based on experience and insight of a unique and an essential personal nature ... and can't be acquired, but has to be personally experienced"* (Burrell, 2001, p.2). Equivalent to the former paragraph, this constitutes another antithetic distinction between an objective (or Positivistic) and a subjective (or Interpretavistic) viewpoint of knowledge.

Burell (2001) furthermore states that human nature is distinguished between Determinism and Voluntarism. A deterministic view regards humans as totally determined by the situation or environment in which they are, whereas a voluntaristic view believes that every man is autonomous and free-willed (Denzin and Lincoln, 2005).

As Burell (2001) further points out, the methodological debate takes place between a Nomothetic and an Ideographic theory. A Nomothetic view emphasises basic research upon a systematic protocol and technique. It mainly *"focuses on testing hypotheses in accordance to the construction of scientific tests and the use of quantitative techniques for the analysis of data."* (p. 6). An Ideographic approach however, believes that a researcher *"can only understand the social world by obtaining first-hand knowledge of the subject under investigation"* (p. 6).

Critical Realism

As explained in the former paragraph, realists claim that there is one objective reality which exists independently of the knowledge that can be gained about it. Therefore a key criterion to reject a purely positivistic approach is however, that it would ignore the existence of the social realities of the teams this project aims to research.

In contrast, interpretivists or constructivists in contrast claim that reality is unreal and individually constructed (Gephart 1999, Easton 2000) and that there is no objective truth. Accordingly, a purely interpretavistic approach would fail to explain the causalities being generated by the existent social reality of the teams being researched.

Having said that, critical realists distinguish between a natural and a social word and argue that the latter is relative to and dependent on the context and the human actors (or agents), which interact with their environment and transform and reproduce reality (Bhaskar 1998). The view that there is one real social world but the knowledge which can be gained about it is relative to a certain context leads to the belief that there are tangible and observable factors and intangible and unobservable factors of this reality which are latent and hidden and dependent on a particular context (Jessop, 2001).

In other words, for a critical realist, social reality consists of tangible and observable structures and contexts, and the meanings its social actors (agents) attribute to them. This enables a critical realist, in contrast to a constructivist, to reveal this social reality and explain the causalities that have generated it (Bhaskar 1998).

Since the aim of this project is to understand the phenomena of teamwork of two entrepreneurial teams, and thereafter to explain the causes of these phenomena, this more comprehensive research philosophy is better suitable and superior in comparison to the aforementioned approaches.

Retroductive Reasoning

Having defined the way they understand the world, the researcher then hast to define how they will gain knowledge about it (Research Design Chapter 4) and how they will makes sense of the knowledge they have gained, which is explained here.

As important as the philosophical standpoint is thus a researchers' reasoning approach which is the way they will make logical inferences from their yielded data which is strongly determining the structure of the work and the results. As Saunders et al. (2003) explain, is the selection of an appropriate reasoning approach as crucial as the selection of the right philosophy in order to construct a strong academic framework.

The researcher can choose between different reasoning approaches but since it is pivotal that research aims and questions, research philosophy, research design and reasoning approach are all in line with one another, the selection of the right approach is considerably important.

Deductive and **Inductive Reasoning** are the most familiar reasoning approaches. Deductive reasoning is the method of reasoning from the general to the particular which means, that single cognitions are gained from general theories. Inductive Reasoning works vice versa. As a consequence, deductive reasoning is strongly dependent on its premises. A critical point is that a false premise can possibly lead to a false result and inconclusive premises will also yield in an inconclusive conclusion (Zarefski 2002).

Inductive Reasoning is the method of reasoning from the particular to the general meaning, whereby the premises of an argument are believed to support the conclusion but do not ensure it. It is often used to formulate legalities and to develop theories from limited observations or from investigations into new fields. Conclusions that are drawn this way can easily be true or false and the inductive logic does not necessarily provide a strong conclusion (Cussens 1996).

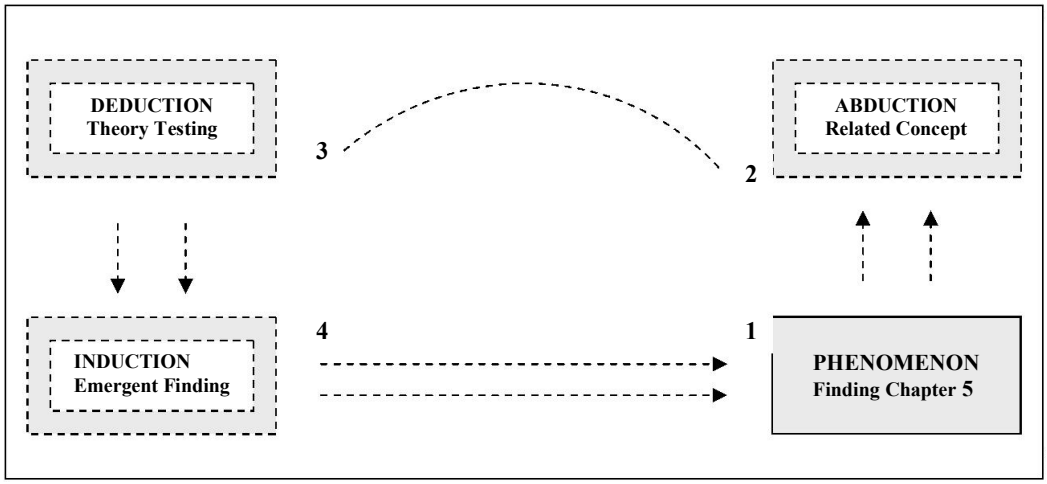
Although the American mathematician and philosopher Peirce had already argued in the 19th century that there was another form of reasoning which he called **Abductive Reasoning** this concept is still used relatively infrequently. This is inter alia the result of the fact that Peirce used this term interchangeably with the term **Retroductive Reasoning**, although both are distinctive concepts.

Retroductive reasoning is an overarching concept comprising abductive, deductive and inductive steps of reasoning. It entails going backwards (abductively) to the unknown and making something operative as of that date. The term indicates that **retro duction** not only refers to the apprehension of a **surprising fact** and an ensuing hunch, but also that **the hunch, once formed, is deliberately and recursively taken backward for analysis and adjustment** (requiring deduction and induction), before it is engendered into a hypothesis worthy of extensive testing. Lawson (2004) explains that this way of reasoning involves moving from the conception of some phenomena to a different thing which could have generated this particular phenomenon. Pierce explained that Retroduction (or Hypothetic Inference) depends on our hope, sooner or later, to guess at the conditions under which a given kind of phenomenon will present itself (Ayim, 1974).

In relation to this project, keeping a critical realist approach and the underlying research questions in mind, this means that initially, first observable and tangible phenomena and their context are being discovered and described. These context and phenomena will then be taken back to the point where they have been generated and operationalised and by the application of already existing concepts of other phenomena they will be tested and eventually explained (Figure 2).

A point of criticism with regards to a retroductive argument lies in its high vulnerability against fallacies. It starts with a phenomenon (or symptom) and tries to find an explanation which is dependent on a different theory (or concept). But different concepts can generate the same phenomenon but would result in different explanations for the mechanisms that were causal for the phenomena in a particular context. Critical realists face this critique quite pragmatically, stating that as long as the gained knowledge is sufficient enough to effectively lead the actions it has made a valuable contribution.

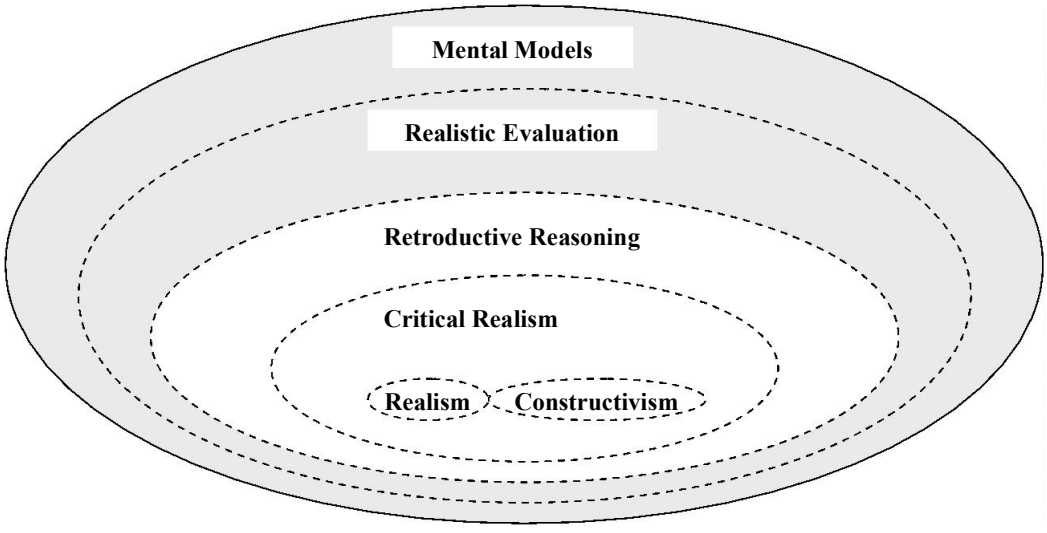
Figure 2: Retroductive Reasoning



Own Design

After research philosophy and reasoning approach have been defined, the researcher has to decide which concept is best suitable to convert the underlying philosophical and logical assumptions into a meaningful and consistent methodology, to ensure a rigour data gathering and analysis. The methods of data gathering and data analysis are part of the research design which is subject matter of Chapter 4. Figure 3 below shows the overarching and comprising research paradigm of this project.

Figure 3: Research Paradigm



Own Design

Research Design

Introduction

So far Chapter 1 has explained how this project evolved from a prevalent problem in innovation and entrepreneurship practice and has also given background information about it. Furthermore its structure and research aims have been clarified. Chapter 2 has presented the necessary theoretical framework to understand the subject being researched, and Chapter 3 has explained the paper's underlying philosophy and logic.

This Chapter presents the methods being used to gather and analyse the required data. Inter alia the planning of a research attempt involves the decision of which population the data should be gathered from and how much data is required. Secondly, it requires a decision on how this data is to be gathered and eventually analysed.

Purposive Sampling

As explained above, the right sampling strategy is an important feature of a research design. It is often not possible or not necessary in social science to collect data from the whole population (because the population is for example unknown). Furthermore data from a huge population that can be statistically analysed does not suit the underlying research philosophy and reasoning approach of this project. That is, in social sciences often alternative suitable sample strategies have to be applied.

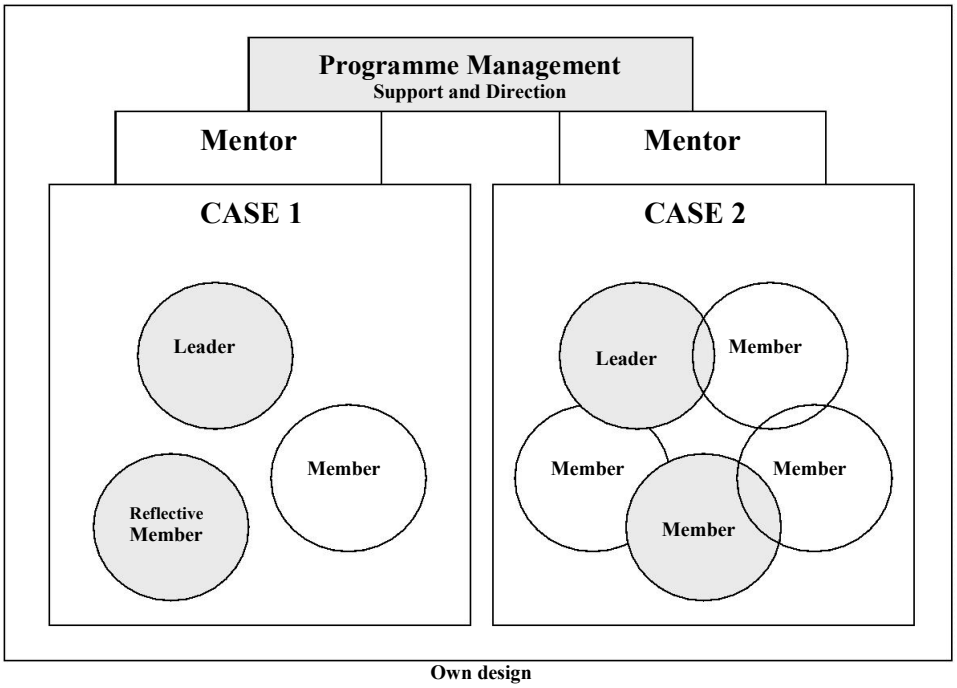
Keeping the research philosophy, the reasoning approach and the research aims in mind, the in-depth study of a case is a much more suitable strategy. A way to identify a meaningful sample within such a case is a purposeful sampling strategy (Yin, 2003). Bryman (2004) explains that the strategic intention of Purposeful Sampling is crucial. The usefulness of this sampling strategy for this project lies in its ability to increase the richness of the acquired knowledge by strategically identifying particular useful research objects, which promise rich information and can be studied in-depth to formulate a strong retroductive argument. The researcher basically has the choice to study a single case or multiple cases. Within the timeframe of the project more than 2 cases would result in an inadequate amount of data gathering per case, which could

not provide a deeper insight. Hence this study concentrates on the comparative study of 2 Cases with the aim to gain a deeper insight into a rather smaller sample.

During a discussion about an appropriate sampling strategy, the programme management mentioned difficulties of a team and that it was questionable whether this project could be carried on. This fact coupled with a second hint about the reflectivity of one of its team members put the team in the centre of interest, and generated the idea of a comparative case study between the best and the worst performing team within the programme. With the help of the programme management, a second team which outperformed all other teams in this particular programme generation was identified. All in all the generation consisted of five teams and contact was initially made with all five, but data gathering was focused on the above mentioned 2 Cases. In order to gain a preferably deep insight, the data had to be collected from different perspectives.

Figure 4Figure 4 shows how the sampling strategy was finally applied. In order to capture perspectives from all team levels, the team leader and one team member from both teams were chosen. Whereas the team member in Case 1 was the above mentioned reflective individual, the team member within Case 2 was chosen randomly.

Figure 4: Sampling Strategy



Own design

At this point a further important notion has to be made concerning the sample size. Positivists state that such a sample size is not sufficient to result in strong explanations. Eisenhardt (1989) for instance argues that a sample which should result in a strong explanation needs to include four samples per case at least. Having said this, Harrison and Easton (2004) just counter this: *"Identifying a plausible, defensible deep explanation in one instance can be a major contribution to theory* (p. 195).

Methods of Data Gathering

The most suitable method to gather the required and desired data is dependent on several variables. A first consideration is its philosophical fit. Furthermore, issues that are often underestimated by inexperienced researchers are general conditions and organisational parameters such as time frames, location of the research site and access to, and availability of research objects. Besides a thorough planning of the data gathering process and a rigour execution, access and availability of the research objects and disruptive factors have to be planned and anticipated as well as possible, to ensure a successful collection of the required data within the time constraints of the project.

The social researcher has the choice between quantitative and qualitative research methods. Qualitative research methods often aim to gain a deeper insight into a small and little researched field. They are open for emergent results and frequently used in combination with an inductive reasoning approach. Having said this, quantitative research methods are suitable for well known research fields and often narrowed and used in combination with deductive reasoning approaches (March and Simon 1993). With regard to the research aim of this study which is to gain a deep understanding of entrepreneurial teamwork, qualitative research methods are more suitable.

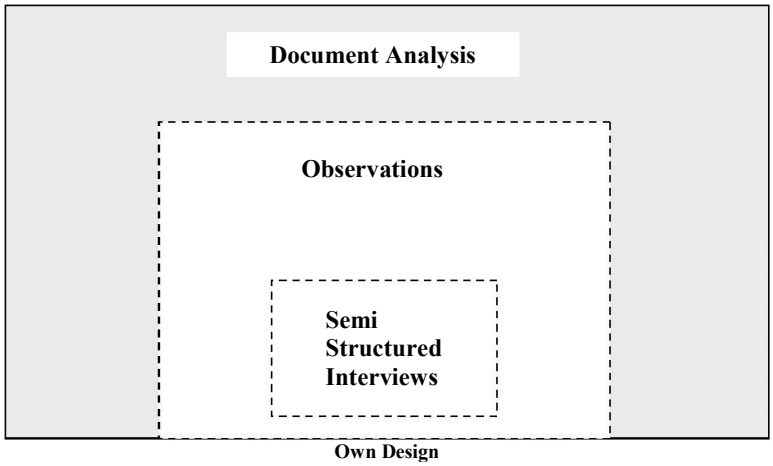
Among qualitative research methods one can find ethnography, participant observations, interviews and document analysis. Ethnography is a research method where the researcher immerses themselves in a social setting for an extend period of time to observe behaviours, to listen to what is said in conversations and to ask questions. However, ethnography has a more comprehensive scope than an observation. The term is in addition frequently used to refer to the written output of ethnographic research (Bryman, 2004, p. 539). An ethnographic data gathering method generates rich data

about a research object because it involves an in-depth study but can last several years. Because of the relatively short time frame of a master dissertation, namely a maximum of 3 months (including data gathering and write up), this method of data gathering is not feasible for the project. Observations however are possible and complement, and can enhance the understanding of data researched by other methods.

Further feasible research methods are interviews and document analysis. Three types of interviews can be used: unstructured, semi-structured and structured interviews. Structured interviews are sometimes also called standardised interviews because of their purpose to give all interviewees a standardised interview in order to be able to aggregate their responses. The intention of a structured interview is to keep errors to a minimum and thus to improve objectivity and reliability in order to make answers more comparable. The questions they ask are mostly closed and they are often used in survey research. Interviewers are supposed to read out the questions in exactly the same order as they are printed (Bryman, 2004). This feature makes them an instrument frequently used in quantitative research rather than in qualitative research.

In contrast, qualitative researchers often use semi-structured or unstructured interviews because of their reciprocal intension. In contrast to structured interviewing, semi-structured and unstructured interviewing tries to provide a maximum of flexibility and adaptability combined with a minimum of structure which allows interviewer and interviewee to go with the flow of the interview, resulting data enrichment. As a consequence for this project, semi-structured interviews will be used. The third and last research method being used is a document analysis. In Figure 5, this implementation strategy from broad to narrow is presented. The reason for the document analysis as being the first method is to open up the world of this research site and its research community, provide a first insight and support the research process.

Figure 5: Implementation of Research Methods



Process of Data Gathering

The research had to be conducted at the research site in Munich Germany. Therefore the department had to give permission for a month long stay abroad. The person responsible for the project in Munich did everything conceivable to ensure that the research attempt could run smoothly and proposed to meet the research community in Munich during a conference about 'Discontinuous Innovation' (**see Appendix**).

A week after the conference, the document analysis had started and external sources, such as the programme web page **(see 5.2)** and information brochures, as well as internal sources of information, like contracts and information from the programme intranet[10], were studied. Additionally, access to some restricted internal research documents was given. The document analysis provided a good overview and made the researcher familiar with the research site, the programme and the people involved.

[10] Access to the password protected programme intranet, where all projects have a presence was provided from the start, which facilitated the research process and gave insight into programme structures and processes. However, getting information was not always as easy as explained here.

The document analysis revealed that the programme made provisions for a Generation Day (G-Day), a regular meeting where all current programme generations[11] come together to share thoughts concerning their projects. Attending a G-Day was a great opportunity to meet all three current generations of teams (approximately 60 foundationers) to get a feeling for the programme culture and to make observations which can later enhance and enrich the understanding of the data gathered by the four in-depth interviews taken. The 2 hours lasting event was fully recorded and notes were taken.

The above shown implementation strategy considerably helped to validate the assumptions based on the document analysis and the discussions with the programme management and to revise and refine the preparation of the crucial part of data gathering, namely, the four in-depth interviews.

Based on the research aim, information was gathered from documents and observations prior to the interviews. A semi-structured interview guide (team leader-team member) was designed (**see Appendix**) and tested. Designing splits between questions (open enough to capture rich information and ensure an in-depth analysis to aid the retrieval of data) was considerably difficult. Accordingly, the interview guide had to be retested and refined twice in succession with different interviewees, before the information they delivered was considered to be satisfactory.

All four interviews were conducted face-to-face and each one had an average duration of 1 hour. The interviewees had been asked to take in part in the interviews via email and had been thoroughly informed about the research project, the interviewing process and the treatment of their interview data in beforehand. Interviewing was voluntary, hence interviewees could refuse to take part in the study. Fortunately, the interest in this project was considerably high. After an introduction about the broad focus of the interview, approval for recording was requested and interviews were conducted.

All interviews had to be conducted in the German language, fully transcribed, translated into English and sent back to the interviewees to confirm the statements, This

[11] The programme on a termly rotation and a group of 20 founders are accepted every term which is called a programme generation. The programme researched is explained in detail in chapter 5.1.

procedure was necessary to minimise transcribing and translating bias and to obtain the permission to use the data. The next paragraph explains their analysis process.

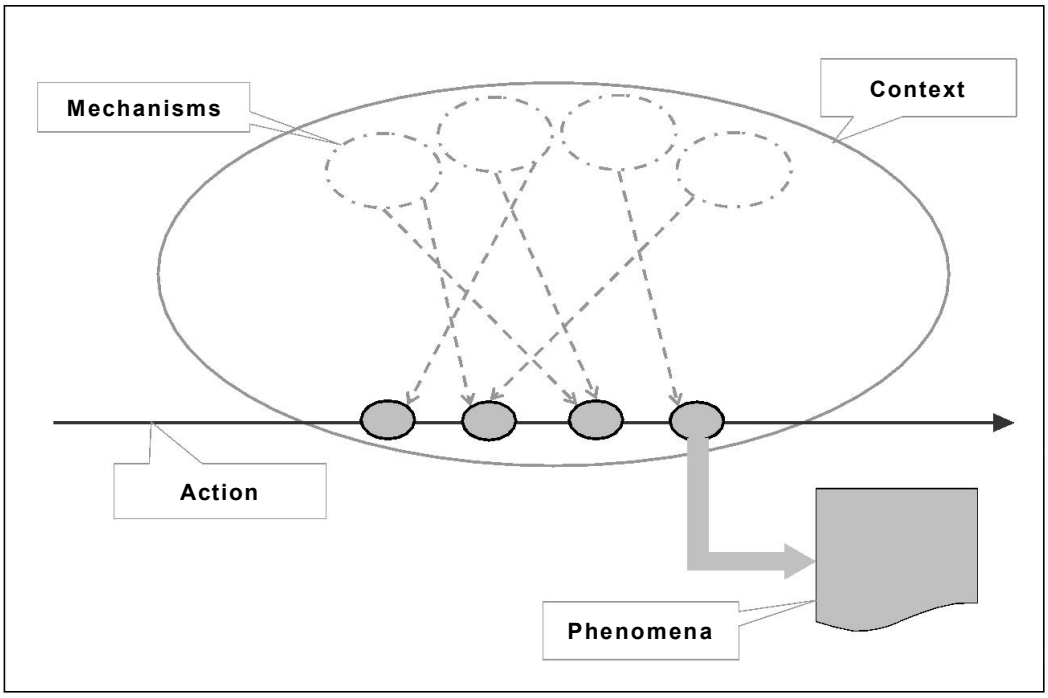
Method of Data Analysis

As intended, these four interviews had generated over 50 DIN-A4 pages of translated interview transcripts. The dangers of such an overwhelming stream of data lies in a very time consuming analysis procedure (the analysis of the interview data took more than 2 weeks), in the opportunity to get lost in the data and in biasing the process by only picking up what is subjectively considered as to be relevant information. The researcher can avoid these pitfalls by rigorously embedding this process into his research philosophy and his reasoning approach, and by adopting a sound process of analysis (comp. Eisenhardt 1989). A rigorous analysis tool, embedded in a critical realist philosophy, is provided by Pawson and Tilley's (1997) **Generative Causation**.

Critical realists believe in the existence of one reality and that knowledge which can be gained about it is relative to an individual's perception and situation. This results in researchable contexts and phenomena and not researchable mechanisms as shown in Figure 6 below. Whilst context and phenomena are being researched by the above research methods (documents, observations and interviews), the unobservable mechanisms have to be discovered by means of the development of a retroduction (**see 2.4.**). Pawson and Tilley (1997, p.58) explain the functionality of their generative causation:

"Action is causal only if its outcome is triggered by mechanisms acting in a context"

Figure 6: Generative Causation



Adapted from Pawson R. and Tilley N. (1997)

Chapter 1 has explained that Prototyping is an essential tool which has been used in this programme to foster entrepreneurial teamwork, through the generation of shared mental models between individuals. Chapter 2 has explained this concept in order to enhance the understanding of the results of this work. However, the concept of effective self-managed team work models has another function, which is to serve as a means to move outwards from a biased and subjective way of interpreting the contexts and phenomena discussed. It is through this concept that these mental models and phenomena will be understood and through which the themes, which serve as the basis for the underlying powers discussed in Chapter 6, will be derived. The procedure for analysis in Chapter 5 thus includes three steps that are explained below:

1) A line-by-line analysis to categorise data into contexts and phenomena related interview extracts[12].

2) The discovery of converging and diverging context phenomena perspectives by contrasting them both team-wise.

3) The identification of meaningful themes for the development of their underlying mechanisms by adopting Druskat and Pescosolido's concept.

Chapter 5 presents the empirical findings discovered by means of Pawson and Tilley's Context-mechanism-phenomena Conceptualisation that represent the tangible and thus researchable part of reality. Chapter 6 is then developing the intangible inresearchable underlying mechanisms by means of retroductive reasoning.

Discovered Contexts and Phenomena

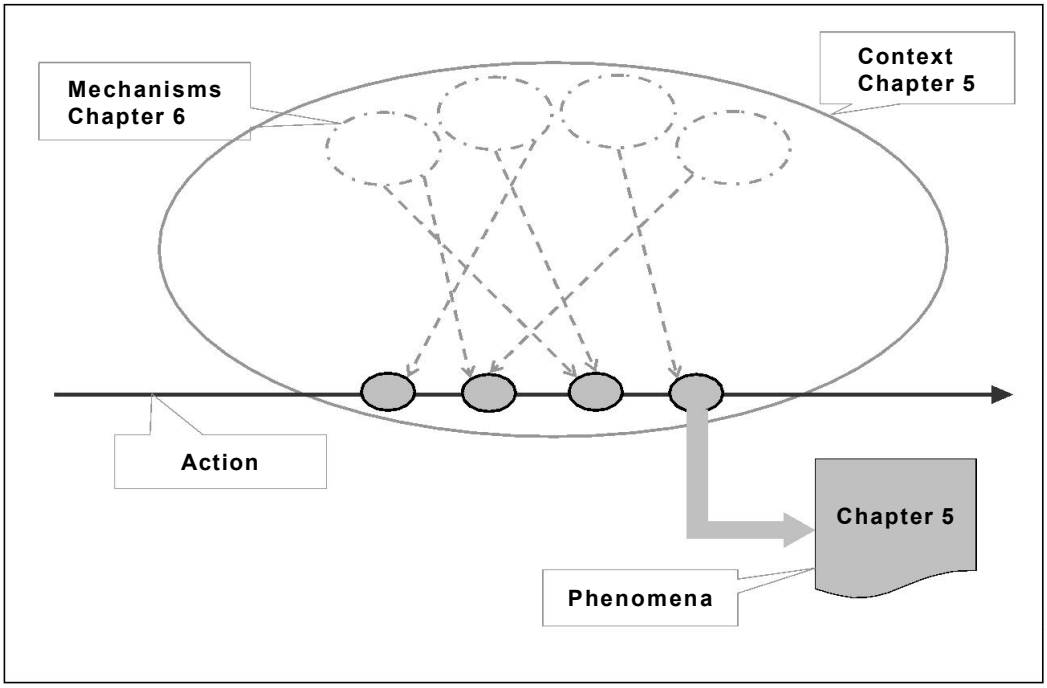
Introduction

This chapter aims to answer the first research question which attempts to understand the contexts and the phenomena which occur during the entrepreneurial teamwork in this entrepreneurial teamwork development programme. For this purpose it comments on extracts from four in-depth interviews in which interviewees gave indications of either the context in which they had worked or the phenomena which had occurred.

As explained in Chapter 2, critical realists believe that there is one social reality but that the knowledge which can be gained about it is not absolute but relative to the situation in which it is gained. Referring to this research, this implies that knowledge is relative to each interviewee's situation. Therefore these situations have to be clarified and understood as comprehensively as possible, before any further steps to explain these phenomena can be made. Figure 7 is depicting the aim of this chapter:

[12] Categorising was a time consuming work because it was often difficult to clearly distinguish be tween context and outcome statements which has resulted in many iterative loops of analysis and annotation. In these situations it was helpful to re-embed and relate quotes to the broader context.

Figure 7: Aim of Chapter 5



Adapted from Pawson and Tilley (1997)

However, some circumstances in interview situations have already been described in Chapter 4 (Research Design). This chapter deals with the critical but crucial aspect of each interviewee's subjective perspective on reality. The objective of this chapter is to enhance the understanding of each of these different perspectives and to discover the necessary anchor points from which their underlying mechanism can be derived.

Section 5.2 first presents the wider context of the programme. Secondly, in an analogous way, the subsequent parts start with a brief description of the individual team situations and continue with some background information about each interviewee. Then interview extracts of each interview are presented, commented on and summarised. In a further step these individual perspectives are contrasted team-wise. The aforementioned concept for effective self-managed teamwork finally enables the identification of the necessary themes that serve as the basis for the following discussion.

The Programme

The programme being researched is a promotional programme for young entrepreneurial talents at the Centre for Entrepreneurship at one of German's leading universities. Every student can apply for this programme and each term 20 committed students from all faculties are selected. The scholarship covers the support of the planning and execution of customer-oriented projects and thus provides practical training with management tools and coaching through an experienced mentor. The foundationers transform business concepts into innovations and marketable products or services, which can then be the gateways for new business start-ups. As **tomorrow's entrepreneurs** they constitute a strong network which is geared to create value. The programme is embedded in a strong network of academic and industrial partners. Figure 8 is taken from the programme web page and provides insight into the programme vision:

Figure 8: Programme Vision

"It is personalities, not principles that move the age." Oscar Wilde

What makes an entrepreneurial personality? They have character, charisma, bravery and the necessary powers of self-assertion in order to bring innovations forward. They optimise their strength, learn from mistakes and exploit their full potential through continuously reflection. They are powerful, fascinating and they move things!

We look forward to accompanying foundationers in their entrepreneurial development!

Taken from the Programme Web Page

The Centre for Entrepreneurship was founded in 2002 and is an independent but affiliated institute of the university. It fosters the entrepreneurial thinking of students and scientists, and supervises entrepreneurial teams during their development of products and services. Approximately 1000 students per year take part in courses and lectures, develop prototypes for marketable products and are accompanied on their way to launch their own business start-ups.

In 2004 this centre launched a development programme. Since then, every term (6 months) twenty new students join the programme for 3 terms. In its 7th generation five teams are working on innovative projects. The maxim of the programme is **Demand and Develop** and aims at the development of young entrepreneurial personalities and the enhancement of their entrepreneurial self-confidence and self-management through demanding projects. Within a short time frame foundationers plan and realise innovative concepts for products and services with the aim to acquire the practical armamentarium, the soft-, communication- and presentation-skills as well as the ability to work in a teams and to develop an understanding of economical relations. During their studies foundationers get in a good position to either launch their own businesses or to be successful entrepreneurs in future positions.

Findings of Case 1

Background

Since the statements of each interviewee must be understood in their specific context, the following passage starts with a brief description of the background of the team. The team is one of five interdisciplinary teams of the 7th programme generation. The team leader is a female business administration student. Her two team members are an engineering student and an information technology student.

Since three month, this team has worked on a business model which aims to compensate the inevitable CO2 emissions of private citizens. The team has designed a letter paper in a green colour with imprints which are designed to remind the customer of environmental-friendly products and which could be sold in post offices or stationary shops. Price and cost would slightly exceed an ordinary stationary product but the higher margins are directly invested in environmental projects which aim to reduce CO2 emissions.

The first project phase is designated to end a month after the interviews have been conducted and the team had already collected feedback from stationary shops to gain inside information regarding whether or not the product would be viable for potential

customers. The team now has to decide whether the project should be carried on and whether a business should be launched.

The following section offers an amount of presentations and cementations but no interpretations of the team leader's perception of the team situation in Case 1.

Context and Phenomena from the Team Leader Perspective

The team leader joined the team as the last member. She studied a course on Technology and Management-Orientated Business Administration and had experience of the programme culture as different from the university culture. She is comments below:

C1 – The culture is constantly changing but pleasurable

The quotes below present the team leader's perception of the programme culture:

> *"The culture is open, real, flexible and constantly changing. Every term you have some 20 new people coming and 20 leave. You constantly meet new people. Generally I think it's a quite pleasurable culture. People have committed themselves and in the majority of cases they are motivated accordingly. I enjoy working with them very much."*

Even though she describes the programme culture as pleasurable and enjoyable the interview extract reveals some sort of reluctance and a lack of disclosure.

C2 – Difficult personalities can cause a problematic programme culture

Here she gives a further more precise description of her perception of culture:

> *"Well, I think there's a subculture of foundationers who only do it for their academic record. I think there are three different types of people within the programme."*

> *"I think the reason why there are often problems within the programme is that many strong personalities can be encountered. There are many people with strong personalities because they have done more than just getting excellent*

marks. It either works out or not. And when problems occur it gets very difficult because you don't find many people who would remain reticent and say nothing."

This description of culture seems to be contradictory to the first quote. In later disclosures it is revealed that the team leader perceives this culture as rather problematic.

C3 - She can work better with team members when she has a good relationship with them

Besides the programme's culture she comments on a further contextual aspect:

"It's more difficult for me to work with someone, who doesn't have a personal interest in others. It's more difficult because if you get along with someone very well and occasionally have a drink together, it's usually easier to work together, too"

"The other team member is not interested in a personal relation. Thus our team culture is rather taking place on a work level and not so much on a personal level. It would be nice to meet up more privately to work things out, but none of us have enough time for that and it unfortunately doesn't work."

The above quotes clearly reveal a preference for interpersonal relationships. In a different interview extract she comments on this aspect in more detail. Aside from this noticeable preference, the interviewee clearly points out that her preference for personal relationships affects her ability to work with other individuals.

P1 – Extensive communication is painful for the team leader

A specific characteristic of her perception of communication is presented below:

"What I don't like is that it is sometimes a bit slow. I mean if you meet in a big group and there are occasionally ever lasting discussions where you sometimes think: 'Get to the point!' which is a bit a pain in the arse. Much idle talk…yes it's difficult if things are being discussed which are already obvious

and clear and they are chewed through and you think: 'When is this going to be over?' which is not that nice."

The above comment further suggests adversity against extensive communication. Unfortunately it can not be derived from this extract, as to whether the adversity discovered is only valid in this particular team situation or transferable to other situations.

P2 - Conflicts result in a serious team situation

The following quote presents a further phenomenon that had occurred in this team:

"Well, it's tense because there were some conflicts between one of my team mates and me, and the other one, but in the meantime it's a bit quieter. We are actually a very serious team."

An interesting point to note is how the interviewee describes the development from conflict to quietness to seriousness. Adding the third team member later makes it difficult to clearly say where the conflict is predominantly situated. It can not be said whether one can attach any importance to this later notion of the third member or not.

P3 – The team leader's decisions are influenced by interpersonal issues

In the course of the conversation the team leader seems to provide a deeper insight into causes that influence her behaviours and actions:

"I think nobody would say this but you don't make objective decisions any more. Decisions are rather subjective because you think: 'He has only stupid ideas." I mean you said I shall be honest, right?"

She states that her decisions are influenced by interpersonal issues and shows that she has already has developed an antipathy against one of her team members which makes it difficult for her to value suggestions without prejudice.

P4 - Communication within the team is impersonal and limited

This phenomenon describes how the team is communicating:

"We communicate a lot via email but in the majority of cases we would meet before a presentation and talk ourselves through it."

"I have joined the team later and assumed that he was team leader but there was only little communication…We both assumed this because he had done it before, but somehow he didn't think that he was going to be team leader and we've all talked at cross purposes."

Her statements reveal that communication within the team is impersonal and lacking in face-to-face interaction, and that the team is experiencing miscommunication. The quote furthermore raises the question of whether or not the team had much communication before she joined it.

P5 - A fast diverging team hinders reaching a consensus

The following perspective on teamwork presents a phenomenon that is related to the team's ability to reach a consensus:

"In such situations we had a lack of consensus. You don't say: 'Ok, we are going to launch the business especially if you don't have much time."

"There wasn't much consensus building which I think is more difficult because the team is diverging faster."

Here the interviewee points out that the team had difficulties in reaching consensus. Since a team's ability to reach a consensus is crucial to make decisions, it can be assumed that it is likely to discover difficulties related to the team's ability to make decisions likewise. From her point of view, the cause for this has been a diverging team.

P6 - Cohesion is dramatically weak

The interviewee comments on cohesion existing within this team and narrates:

"From my perspective cohesion is nearly zero. If you have a team which is working well and in which you have cohesion, where all three people are in

line, it would be more likely that you remain reticent and pursue what others want to do."

According to the team leader the cohesion of the team is dramatically weak. From her perspective this can possibly result in a higher conflict-willingness since people are less willing to remain reticent.

P7 - Constructive feedback is taken into account more

Towards the end of the interview the team leader describes two feedback situations:

"And this other women said that we would have to position the envelopes at a different place and that packages would be much more interesting because people would search for such things in those areas more often. This feedback was definitely more constructive and you accept it much better because it is much more rationale and not so subjective."

"I believe feedback will be accepted better if someone is, in a positive way, saying 'You could improve this and you could improve that'. This is very constructive. The other feedback was only discouraging and on the bottom line there weren't any suggestions on how the product could be improved."

In this situation the team had gained feedback from potential customers. As it has already been explained in Chapter 1, gaining exogenous feedback (from customers for instance) is important, since it enables the team to gain inside information about whether the product is interesting for potential clients and how it can be improved. Thus it is considerably critical if feedback is less or not taken into account.

P8 - Taking advantage of hegemony

This phenomenon is illustrated by an account of a situation where the team had come together to discuss the future of the project:

"I subjectively, absolutely agreed with one of my team members and would have liked to say that he should just shut up because we were two and he was

alone. But on the other hand you are team leader and you should take things your team members tell you into account, even if you are outnumbered."

The interviewee is facing a conflict when it is about to decide whether the team should carry on and launch a business and states that she was tempted to make use of the hegemony she possessed.

P9 - Information is not shared openly

Closely related to the former is this interview extract:

"I knew internally from one of my team mates that he wouldn't launch a business with the other because it was difficult for us to work with him. You rather think that if you don't get along anyway, you are not going to spend every free minute with this person. And it's very difficult to communicate this honestly. I was the only person who has said it openly."

This quote emphasises how difficult it is for the team leader to share information about this important issue. Although openly sharing information is crucial for a team's ability to learn this decision had been made **internally** and the decision making process has been **displaced** from a team to a dyadic level.

Table 1 below summarises the context and phenomena identified by this line-by-line analysis. In an analogue way this is applied to all team members, before both perspectives are being contrasted team-wise, in order to identify convergent or divergent contexts and phenomena which will be needed for the later explanation of the underlying mechanisms which have possibly triggered these discovered phenomena.

Table 1: Case 1 - Context and Phenomena - Team Leader Perspective

Context
C1 - The programme culture is constantly changing but pleasurable
C2 - Difficult personalities cause a problematic programme culture
C3 - She can work better with team members when she has a good relationship with them
Phenomena
P1 - Extensive communication is painful for the team leader
P2 - Conflicts result in a serious team situation
P3 - The team leader's decisions are influenced by interpersonal issues
P4 - Communication within the team is impersonal and limited
P5 - A fast diverging team hinders reaching a consensus
P6 - Cohesion is dramatically weak
P7 - Constructive feedback is taken into account more
P8 - Taking advantage of hegemony
P9 - Information is not shared openly

Context and Phenomena from the Team Member Perspective

This interviewee is studying engineering with an emphasis on management. Before his studies he attended a boarding school for multiply highly gifted teenagers. This boarding school had a very special culture, predominantly coined by good manners like mutual respect. He is disappointed and shocked by the programme culture which he perceives as to be very different from the culture he had experienced before.

C1 – The team member had experienced various distinctive cultures before

After boarding school and before university, this team member had joined the army for a year and then matriculated at university. After a culture of control and command in the military he had enjoyed the anonymity at university. In the examples below he describes the special culture he had experienced at this boarding school:

"I am coming from a boarding school for gifted youth. We had a strong emphasis on culture. The culture there was very special because I have created it together with others, and as I was coming here I was very disappointed."

"If we encountered a stranger on the territory of our boarding school, we should always approach her/him and say: "Good morning Madam/Sir, I beg your pardon. May I help you?"

The above extract illustrates the courtesy with which students came across people at this boarding school. In the course of the conversation one could perceive the pride he felt about having been coined and having been part of this very special culture.

C2 - Culture is more important than competition and requires responsibility

He further extends his notion of culture stating:

"I think the notion of culture is more important than the notion of competition. You probably need one who has this entrepreneurial attitude and who is quasi pulling the project, but the others have to work with him. It's counterproductive if they want something else and work against him."

"We felt responsible. When we visited a concert for instance we dressed up formally in suits and celebrated ourselves a bit. It's sweet when I go there as an alumnus and a little 7th grade student is asking me the same question I've once asked strangers."

On the basis of his former cultural experiences he believes that culture is an important feature of a community and has a strong influence on the same. It can be further derived that for him, culture requires responsibility and has to be fostered.

C3 - The programme culture is inconsistent and indifferent

The following context relates to the behaviours of people within the programme:

"The programme culture is indifferent. People don't pull together but rather everyone pulls in a different direction."

"The first thing I've noticed here was that people didn't listen to each other and the spokesman of the board fought with a division leader[13] and they communicated in a very aggressive way right in front of all of us. And I though:' They shouldn't do this, especially not when we meet them for the first time.' I was shocked. I experienced this culture sometimes within the programme and sometimes within teams but overall relatively often."

The statements reveal a context analogy between team leader and team member. Just as the team leader did, he describes the programme culture as to be inconsistent. His opinion about culture in combination with the difficulties he encounters within the programme, are significant. He even goes as far as trying to change the programme culture with his attempt to establish a concept for team spirit:

"I am currently attending many board meetings and trying to talk to all generations and to establish a concept for team spirit. My concern is more on culture than on integration. Some people don't want to be integrated. But people should at least listen to each other, even when they don't like each other."

C4 - The adaptability of people is important.

In addition to the notion of a 'right and consistent' culture he holds the view that individuals have to possess certain adaptability skills settle into a new culture:

"*In difference to the boarding school many people here are quite old and much more settled. Saying, it's difficult to restructure a 25 year old guy and to force him to adapt to a new culture."*

From the interviewee's perspective the adaptability of founders to the programme's culture is as important as the programme culture itself which he puts down to their higher average age of founders within the programme.

C5 – Not enough role models can be found within the programme

His notion of role models is another interesting phenomenon that occurs:

> *"Further you don't have much contact with older generations and you don't find many role models here."*

This quote implies that he thinks the programme does not enable foundationers to **learn from role models**. Unfortunately it can not be derived whether he thinks that the programme does not comprise enough role models or whether the framework does not support learning from them.

C6 - Reflection is important

In this extract the interviewee puts emphasis on reflection about communication:

> *"In our boarding school it just functioned very well. Communication was good and one knew how to communicate. There was a lot of Meta-communication."*

The interviewee does not only talk about the importance of the way **how** people communicate. His notion of Meta-communication further indicates that he appreciates learning from reflection (comp. Argyris' and Schön, 1978)

C7 – Feedback is seen as something 'good'

In this next statement he comments on his attitude towards feedback:

> *"I only had positive feedback but I was probably just lucky. I've heard that the other two had a negative reaction from two women in a stationary shop. Unfortunately, I didn't have the chance to react on something like that. I would try to change this person's mind with good arguments and if you realise that you can't, you should be able to handle it."*

> *"I think positive feedback is always good and also negative feedback is actually not bad because then you know what goes wrong and you know that you can't really persuade this type of person. In my opinion also negative feedback*

is actually not bad you just have to know how to utilise it, even if this means that you have to give up your project. But then the feedback was still right because you've saved money. It's basically critique and thus it's constructive."

The interviewee's opinion on feedback conversations is that they are an opportunity to communicate and a positive challenge. He even regrets that he didn't have the opportunity to get involved in a challenging feedback discussion where two of his team members received a negative feedback from a potential client. The quotes clearly reveal a **positive attitude** towards feedback discussions.

P1 - The team member feels pressurised

In describing a team leadership situation he gives an account on of how he perceives leadership within his team:

*"Relatively early on**,** Jeanine had asked who was willing to launch this business with her, who would show 100% commitment. She had asked us to make a decision until 2 weeks ago, which was really early. I felt taken by surprise and thought that would mean I would have to work for this project 6 days a week for the next 3 month besides my studies. For me this was too early since I couldn't foresee whether the project was going to be good or not and hence I couldn't make a decision."*

The team leader's early demand to decide whether the project should be carried on and taken to market implies that the interviewee felt pressurised. According to the project plan the project was designed to end on the 3rd of August, which was shortly after this interview. In its state then, the team neither had client support nor was its continuation guaranteed. In addition, the team still faced several difficult situations.

P2 - Feedback is taken personally and thus not used effectively

The extracts below describe different feedback situations of the team from the team members' perspective:

"We had a feedback discussion after a meeting and according to the feedback rules feedback should be taken note of but not commented upon. But she really felt offended and fired back directly although I didn't intend to attack her at all. I just wanted an agenda for our meetings. For the next meeting she had prepared such an agenda and in the beginning of our meeting she read it out in a loud and cynical way and I realised that she couldn't deal with my critique."

"Feedback from outside the team reached the team but the question was what we made out of it. I think because we don't work together very well many things fall by the wayside. We can't really deal with it internally."

The team member seems disappointed that his team leader can not deal with his critique and he regrets that his team is not really able to use feedback effectively. The comments on the team leader's perception of feedback situation have already emphasised the importance of feedback for teams within this programme.

P3 - The team can not reach a consensus and seeks external help

The team's difficulties eventually result in a nearly hopeless situation for the project:

"Even now, opinions are still the same and we can't reach consensus although we've really tried hard and at present we don't even talk to each other. Our team hit rock bottom. I searched for help and we had a further meeting with the programme management."

Although the team had tried hard it had realised that it had failed to overcome its difficulties and sought external advice. **Small group forming** has obviously already happened as the two quotes from the team leader had revealed (P7 and P8). Table 2 on the next page is again summarising this context and the phenomena but this time from a different, namely the team members perspective.

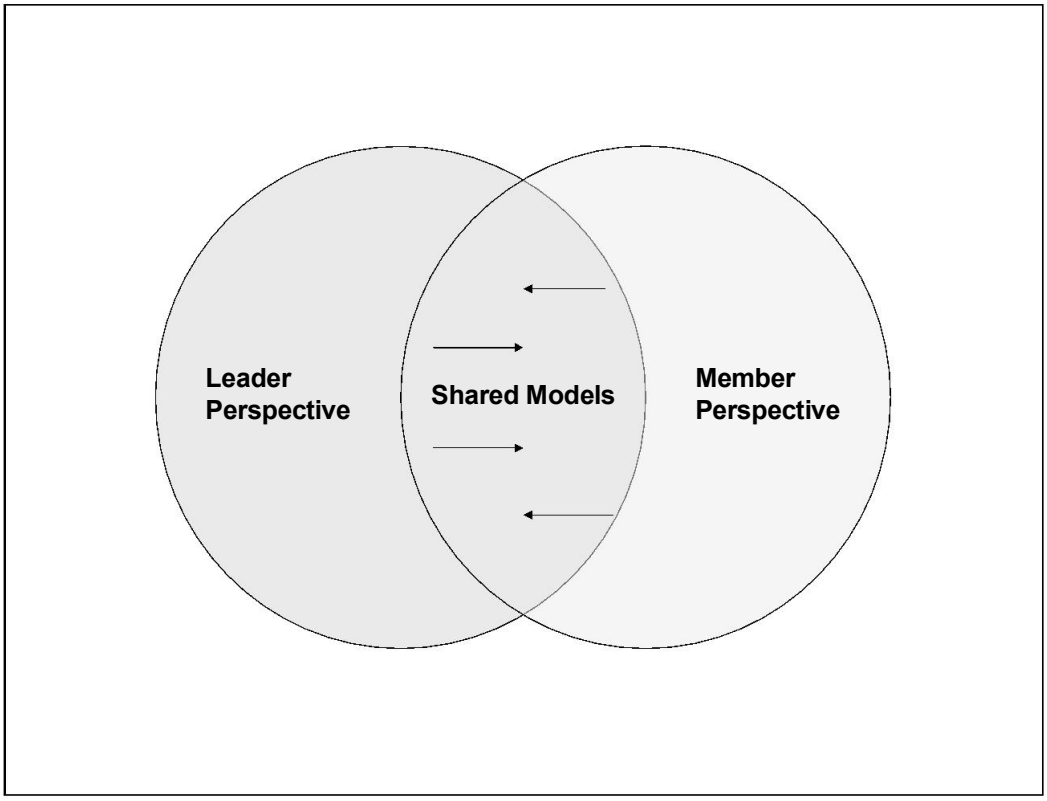
Table 2: Case 1 - Context and Phenomena - Team Member Perspective

Context
C1 - The team member had experienced various distinctive cultures before
C2 - Culture is more important then competition and requires responsibility
C3 - The programme culture is inconsistent and indifferent
C4 - The adaptability of people is important
C5 - Not enough role models can be found within the programme
C6 - Reflection is important
C7 - Feedback is seen as something 'good'
Phenomena
P1 - The team member feels pressurised
P2 - Feedback is taken personally and not used effectively
P3 - The team can not reach a consensus and seeks external help

Process of Contrasting Team Perspectives

Figure 9Figure 9 shows how the in the literature review and data analysis chapters explained analysis process works in practice. The individually identified context perspectives are now being team-wise contrasted and thus classified in convergent (shared) and divergent contexts and team phenomena are developed similarly. The result of this process is subsequently presented in a table. The adoption of Druskat and Pescosolido's (2002) concept of effective teamwork mental models generates the themes which, in combination with the identified convergence or divergence of models (constituting their degrees of overlap, or in other words their strength), will serve as the means to discovering underlying mechanisms which had triggered these phenomena. The contrasted and summarised team perspectives of Case 1 are presented in Table 3 and the themes in the subsequent Table 4.

Figure 9: Contrasting Team Perspectives



Own Design

Table 3: Case 1 - Summarised and Contrasted Team Perspectives

Leader	Case 1	Member
Convergent Context		
Culture has negative attributes		
Divergent Context		
1) The programme culture is con stantly changing but pleasurable		1) The team member had experienced various distinctive cultures before
2) She can work better with team members when she has a good in terpersonal relationship with them		2) Culture is more important then com petition and requires responsibility
		3) The programme culture is inconsis tent and indifferent
		4) The adaptability of people is impor tant
3) Feedback is taken personally and not used effectively		5) Not enough role models can be found within the programme
		6) Reflection is important
		7) Feedback is seen as something 'good'
Team Phenomena		
A) Extensive communication is painful for the team leader		
B) Conflicts result in a serious team situation		
C) The team leader's decisions are influenced by interpersonal issues		
D) Communication within the team is impersonal and limited		
E) The tam diverges fast and can not reach a consensus		
F) Cohesion is dramatically weak		
G) Constructive feedback is taken into account more		
H) Taking advantage of hegemony		
I) Information is not shared openly		
J) Team members feels pressurised		
G) Feedback is taken personally and not used effectively		

The research aim of this project is to discover, understand and explain the phenomena of entrepreneurial teamwork within teams which use Prototyping as a tool to foster their innovation process and work in a self-managed way. Section 2.4 has already explained why this combination of circumstances makes Druskat and Pescosolido's concept of effective self-managed work teams a particular suitable theoretical lens with which the in this chapter discovered phenomena can be understood. In the moment this concept is applied meaningful related themes emerge in Table 4 below. In an analogous way the same procedure is applied for the findings of Case 2 subsequently.

Table 4: Themes of Case 1

Finding	Phenomenon	Theme
E , F	Little Commitment and Participation	**Weak Psychological Ownership**
H , I	Misuse of Hegemony	**Learning is Discontinued**
G	Feedback is Not Always Taken into Account	
C	Decisions are negatively Influenced	
B , C , J	Conflicts and Pressure Situations	**Heedless Interrelating**
A, D	Impersonal Communication	

Findings of Case 2

Background

The second project involved a team consisiting of two Mechanical Engineering students, a Beverage and Brewing Technology student, a Technology and management-orientated Business Administration student and a female team leader who is studying Molecular Biotechnology. This team as well works on a business model which is aimed to reduce inevitable CO2 emissions:

> *"It is our vision to enable private customers to contribute to environmental protection through the compensation of emitted CO2."*

"The value creation process of the fashion business is producing inevitable CO2. Cotton growing, production of cloths, logistical distribution as well as cleaning and ironing, more precisely, the whole product life-cycle is accompagnied by CO2 emisions. Our goal is to reduce these emissions through compensation products of Climate Interchange AG. Our concept is aimed at the fashion industry. Buttons, placed on fashion, will siganal the compensation of inevitable CO2." [14]

Both interviews were conducted shortly before the team had an important client meeting and in the meantime this client, a quite big fashion advertising firm, has confirmed support for the project.

Context and Phenomena from theTeam Leader Perspective

The team leader was appointed through drawing by lot. Like both interviewees in Case 1, she perceives culture within the programme as to be different from culture at university:

C1 – The culture is enthusiastic, motivated and reliable

This first phenomenon is a different perception of culture compared to the interviewees in Case 1:

"You can rely on that people do what they say they do…There was a noticeable motivation and many proactive people, and an enthusiasm which was new to me. One of the main points at university is that if you want to work with people, it takes ages to get them together."

In contrast to the interviewees from Case 1, this team member perceives culture as proactive and motivated but also as reliable and very relaxed instead of inconsistent and problematic (comp. Case 1).

[14] The two quotes represent the team's visions and are taken from the UnternehmerTUM intranet where all project teams have their own presence. The projects started at the same time but in comparison to all other projetcs this team is still working in the same compositiona and is the only project which is ahead of schedule.

C2 - The team has client support

This extract gives a first example of this team's context:

> *"We only have one big customer, Marc O'Polo, which we met through one of our team members. We are going to meet with Marc O'Polo this Friday."*

The fact that the team has early client support is also playing an important role in later statements, in which a team member explains why he thinks that this fact had a positive influence on his team's situation (comp. C4 of the Case 2 Team Member).

C3 - The Team Leader is sensible about her role

The following quote describes the self-awareness of the team leader:

> *"From time to time I asked if I should change something because I heard about the troubles of other teams but it was ok so far. We have obviously been lucky."*

Enhanced self-awareness is seen as an important precondition for learning and self-development (comp. Bolden, 2005).

C4 - The team leader is aware that face-to-face communication works best

This quote reveals another statement with regards to the team leader's sensibility:

> *"For our team meetings are very important. We meet at least once a week. I personally think that nothing is more important than face-to-face communication. Face-to-face communication is much more important than telephone, Skype or email. And when we meet, nearly all of our team members are always there."*

> *"And when we communicate a lot via email it is sometimes a bit chaotic because the first writes something, the second replies and the third replies and so on..."*

The team leader is aware that impersonal communication such as writing emails is less practicable than face-to-face communication for this team, which again indicates an enhanced self-consciousness about the teamwork within her team.

P1 - Team decisions are made democratically

The following quote gives an account of how decisions are made within this team:

> *"Just recently we had a meeting in which we had to decide if we want to launch the business with Marc O'Polo is supporting us. And we had to decide whether we should found a company constituted under civil law. Everyone was there. Everyone was giving her/his opinion and we've discussed it."*

The quote suggests that the team has the ability to handle situations democratically. In a later extract from the team member a further hint for this team ability will be revealed when it is about how the team is appointing its team leader.

P2 - The team leader exerts a democratic leadership style

The team leader's describes her leadership style:

> *"I'm not a team leader who says: 'This is my decision and you all have to contribute!" It is rather a team of people who get along with one another very well, and which works together. And there is one who is trying to make appointments which work for all and who keeps an overview over everything"*

The team's ability to handle situations democratically, might possibly have led to a rather democratic and laisser-faire leadership behaviour of the team leader.

P3 – The team is flexible and has the ability to adapt to new situations quickly

A further interesting and useful ability of this team is its ability to quickly adapt to various situations:

> *"What I really like is that when somebody is ill, you don't really realise it in our team, not at all!"*

The team's ability to adapt to new situations quickly reappears in a later interview extract again and demonstrates how the team is for example compensating missing team members. One of the team members later explains how the team substitutes its team leader who does not have enough time to fulfil her role (comp. P4 Team Member).

P4 – Cohesion is strong and goes beyond the scope of the project

Besides flexibility this project team is furthermore in possession of a strong team cohesion which is described in the quote below:

> *"When we meet, nearly all of our team members are always there and Christoph already said he also would like to work together with us on a new project. In the meantime the whole team wants to make it. It was a weighting up of risks. If we had to invest a lot of money, nobody would want to do it. But if we don't have to invest too much time and can possibly make some money without taking a big risk, we'll do it."*

The interview extracts do not only reveal that team meetings have a high attendance but also that team cohesion even goes beyond the scope of the current project. The above perspective is again summarised in Table 5 below:

Table 5: Case 2 - Context and Phenomena - Team Leader Perspective

Models
C1 - The culture as enthusiastic, motivated and reliable
C2 - The team has client support
C3 - The team leader is sensible about her role
C4 - The team leader is aware that face-to-face communication works for her team
Phenomenon
P1 - Team decisions are made democratically
P2 - The team leader exerts a democratic leadership style
P3 - The team has the ability to adapt to new situations quickly
P4 - Cohesion is strong and goes beyond the scope of this project

Context and Phenomena from the Team Member Perspective

The last interviewee is studying Technology and Management-Orientated Business Administration. As all other interviewees he perceives a different programme culture:

C1 – The Culture is 'easy going'

The first quote is again related to the interviewee's perception of culture:

> *"I perceive the programme culture as relatively relaxed and easy going which was a bit surprising. Within my business studies it was a bit more stiffly."*

In contrast to Case 1 he perceives this culture as easy-going. The interviewee's different perceptions of culture imposingly demonstrate the suitableness of a critical realism approach and the necessity to take these different perceptions of reality into account, in order to obtain a preferably realistic evaluation of these phenomena.

C2 - The team member reflects about culture

The first quote reveals the interviewees' attitude towards the programme culture:

> *"With regards to the programme culture one could probably encourage people to do both, to give positive feedback and to tell people what they don't like in the beginning of the programme."*

The interviewee comes up with his own suggestion about how things within the programme could be improved: *'one could probably encourage people to do both, to give positive feedback and to tell people what they don't like.'* which does not only give account on his attitude toward culture but also on his cultural awareness.

C3 – The team member is open for learning

This extract reveals that this team member has a positive attitude towards learning:

> *"Of course, I am here to learn something and not because I thought everything would be perfect."*

It can be derived from this quote that he accepts that he will have to make mistakes and have to overcome difficulties and to learn from experiences. This can be described as a 'Learning by Doing' or 'Trial and Error' attitude (comp. Revans 1998).

C4 - The team has client support and does not face a pressurised situation

In this quote he gives another perspective on a contextual aspect of his team which is closely related to the situation presented in quote C2 of the team leader:

> *"From almost the start we were lucky to have the interest from a customer and have not been under the pressure to find one like other teams. I think those two points are very important for positive results."*

He is convinced that client support positively influences the teamwork of his team because it removes the pressure from the team.

C5 – The team members reflects about team situations

These statements report on the team member's ability to reflect about team situations:

> *"Unfortunately we don't give ourselves much feedback I must admit. We could have given ourselves more feedback."*

> *"Recently when our team leader couldn't come that much the four guys have done even more together, especially after work. It became rather more intensive and some of us thought there was danger in excluding her but this was eventually not the case."*

> *"It is good that you mention this. For a long time I have the feeling that this is missing in our team. One should be able to say what she/he doesn't like but one should be careful that it is not too exaggerated. There are always things which disturb you but sometimes they are not so important."*

The above quotes give an account of his consciousness and his ability to reflect about teamwork critically, which is a good precondition for learning (Reynolds, 1997).

P1 - Cohesion is strong

The phenomenon below is related to team cohesion:

> *"We are the only team which still has the same composition as it had in the beginning. All the other teams have been reallocated. This is because we all stand for our ideas any time. In other teams people have swapped because they didn't like the idea or because there were troubles, but this wasn't really so in our team apart from little disagreements."*

This team has worked in the same composition since the start of the project solely which bears witness to its strong team cohesion. An extract from the team leader has already revealed that cohesion is even going beyond the scope of this project (see P4).

P2 - Team members have good relationships

This quote gives an account on the team member's relationships:

> *"After work we often stay and continue in an unproductive way. This works out quite well. Recently, when our team leader didn't have that much time the four guys in our team have even done more together, especially after work."*

Staying together after work and socialising is normal for team members and happens nearly all the time. Later quotes will reveal friendships-like bonds between team members (**comp. P3, P6, P7 this section**). At the same time both quotes indicate that these good relationships can have unproductive outcomes. This fact will later reappear in another quote again.

P3 - Communication is extensive and predominantly face-to-face

The following quote comments on team communication:

> *"I communicate with my team members as I would communicate with friends and I don't try to be different. We really meet face-to-face a lot. I hate emails. We have to discuss a lot, and in emails you can't really discuss, you rather you can send presentations and stuff."*

"We had one situation where we were sitting in a café and talking about the spelling of a difficult technical expression and couldn't reach a consensus. We discussed it for at least 1 hour. Then we asked the waitress and one of our team members suddenly changed sides. Eventually we just marked it in red and asked a language expert. But we didn't argue."

Both the team member and team leader believe that discussions are important for this team and that face-to-face communication works out better than communication by email (**C3**). Even though communication is often extensive the team does not argue.

P4 - The team is flexible and has the ability to adapt to new situations quickly

The team's ability to adapt to new situations quickly was narrated by the team's team leader and is also reflected by this team member:

"In the beginning it was very good but recently not that good any more because she didn't have that much time for the project any more. When you are under pressure and everyone is saying I don't have time at the moment, I think it is the team leader's role to put his foot down and say 'We are going to meet today' In order to bring the team forward. 'We do it like this and if this was wrong it is my responsibility'; which she didn't really do eventually. And if necessary it was Chritstian and me jointly taking over this role and eventually putting some pressure on the team. Not too much, but at least a bit so that we could move forward."

As the team leader could not fulfil her role, two of her team members jointly took over her responsibilities and consciously filled this position.

P5 - Team decision are made democratically

The team leader's perception of phenomenon 1 is also reflected in this extract:

"The advantage here is that everyone wanted to be team leader but we have drawn lots and Feline had won."

"In our team it is rather the majority which is forming the opinion and at one point you all agree or you don't. And then you ask a referee. It was absolutely nonsense to ask the waitress, by the way, because it was very unlikely that she would be a language expert. It was rather about to collecting an external opinion about what the majority of people are thinking."

This extract stems from the beginning of the interview and explains how the team appointed its team leader in one of the first meetings. Interestingly, teamwork seems democratically from the start. The anecdote in the second quote furthermore shows how this team handles decisions making in a playful way.

P6 - Teamwork is a double-edged sword: Effective and Unproductive

The penultimate quote reveals a quite interesting feature of this team's work and a rather unexpected phenomenon:

"One of our team members said for instance: 'I am here as the language expert because where I am from is where we speak the purest German.' He didn't say this in a reproachful way but in a funny way. It was very funny but it also has taken ages and at one point someone said that we should go on with our work."

"It is very easy-going, almost too easy-going. We fool around a lot which is a disadvantage because quite often meetings last for ages and sometimes they end up in beer gardens. Work is sometimes really unproductive. One part of our teamwork is always unproductive. I think this goes back to the personalities in our team."

What phenomenon 2 has already indicated is revealed in this quote: teamwork has an effective and an unproductive part. It seems as though good interpersonal relationships and a too relaxed team situation can also have a negative influence on productive teamwork. Quote 2 additionally had also indicated that the team members had to pay attention that teamwork did not get out of hand: *'It was very funny but it has also taken ages and at one point someone said that we should get on with our work.'*

P7 - Giving critical feedback is difficult

The below quote listed below presents a statement which describes a feedback situation in Case 2:

> *"It would be hard for me to really criticise my team members. But so far, these were only trivial problems. What I have to tell Feline soon is, that she shouldn't interrupt people and let them finish when they speak. Otherwise it is difficult to follow someone because you don't know which person to listen to. Maybe we don't have the heart to say these things."*

> *"It is easier to tell a stranger if something is going wrong because in a friendship you don't want to offend or hurt someone and you would rather treat it with reserve which should actually be the other way round. In a friendship you should be able to say everything."*

As this team member is asked to give examples of feedback situations, he explains that he finds it difficult to criticise team members and describes a situation, where he should have given critical feedback to his team leader which was apparently difficult for him.

These contexts and the phenomena are now summarised and contrasted in Table 6 and the team perspectives are presented in the following Table 7Table 7.

Table 6: Case 2 - Context and Phenomena - Team Member Perspective

Context
C1 - Culture is ‘easy going
C2 - The team member reflects about culture
C3 - The team member is open for learning
C4 - The team has client support and does not face a pressure situation
C5 - The team members reflects about team situations
Phenomena
P1 - Cohesion is strong
P2 - Team members have good relationships
P3 - Communication is extensive and predominantly face-to-face
P4 - The team is flexible and has the ability to adapt to new situations quickly
P5 - Team decision are made democratically
P6 - Teamwork is a double-edged sword: Effective and Unproductive
P7 - Giving critical feedback is difficult

Table 7: Case 2 - Summarised and Contrasted Team Perspectives

Leader	Case 2	Member
Convergent Contexts		
Culture has positive attributes The team has client support		
Divergent Contexts		
1) The team leader is sensible about her role 2) The team leader is aware that face-to-face communication works for her team		1) The team member reflects about culture 2) The team member is open for learning 3) The team does not face a pressure situation 4) The team members reflects about team situations
Team Phenomena		
A) Team decisions are made democratically B) The team leader exerts a democratic leadership style C) Cohesion is strong and goes beyond the scope of this project D) Team members have good relationships E) Communication is extensive and predominantly face-to-face F) The team is flexible and has the ability to adapt to new situations quickly G) Teamwork is a double-edged sword: Effective and Unproductive H) Giving critical feedback is difficult		

Analogously to the procedure in section 5.3.4, from the above discovered contexts and phenomena, team themes will be identified by applying the concept of effective self-managed work teams. Together with the discovered team themes of Case 1, the team themes presented in Table 8 will constitute the basis for the in Chapter 6 following development of the underlying mechanisms of the discovered team phenomena.

Table 8: Themes of Case 2

Findings	Phenomena	Theme
C , D	High Cohesion and Commitment Good Relationships	**High Psychological Ownership**
G	Partly Unproductive Work	
A , B	Democratic Leadership and Decision Making	**Continuous Learning**
I	Little Critical Feedback	
F	Good Flexibility and Adaptability	**Heedful Interrelating**
E	Extensive Face-to-Face Communication	

Triggering Mechanisms

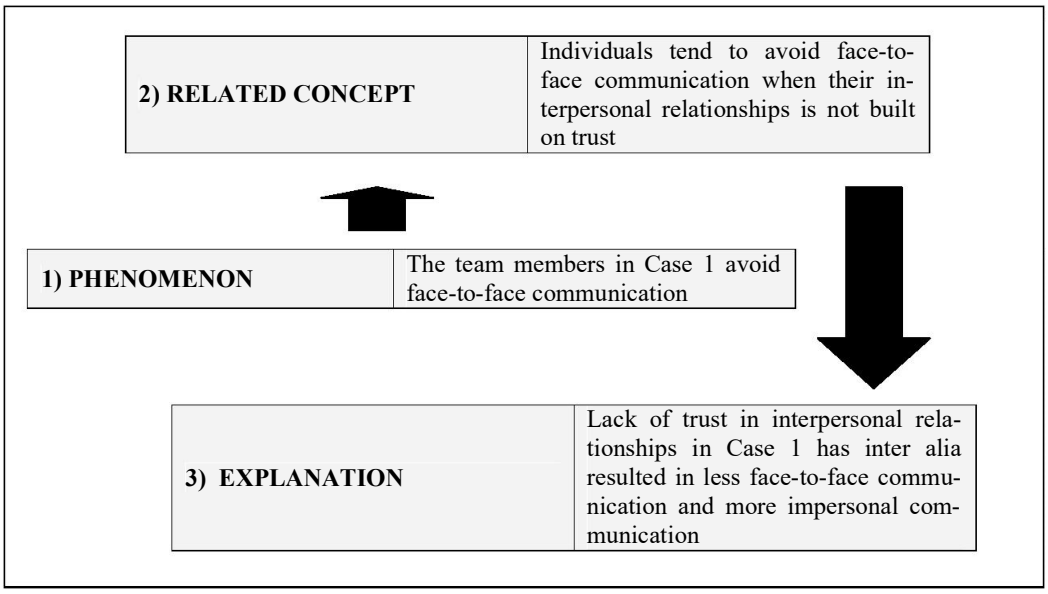
Introduction

In its attempt to answer the first research question, which is to understand how the entrepreneurial teams that were studied worked and to discover the phenomena which occurred during their teamwork, the preceding chapter has presented contexts and has commented on phenomena which occurred in each of the teams. At the end of each of the parts a table was presented. Case 1 showed weak commitment and cohesion, little participation, misused hegemony, disturbed feedback and decision making processes, interpersonal conflicts and impersonal communication. Through the application of Druskat's and Pescosolido's Concept team themes of weak psychological ownership and continuous learning and heedless interaction emerged. Case 2 in contrast showed high commitment and cohesion, good relationships, partly unproductive work situations, democratic leadership and decision making processes, little critical feedback, extensive face-to-face communication and a good team flexibility and adaptability.

The through the application of the core concept emerging themes were a strong models of psychological ownership, continuous learning and heedful interaction.

The aim of this Chapter is to answer the second research question and to explain **why** these phenomena have emerged. By means of retroductive reasoning, the underlying mechanisms are now discovered. Once operationalised, these mechanisms can generate the above mentioned phenomena. In this way they connect the action (the researched entrepreneurial team development programme) with its context (the different team situations) and the emerged phenomena, and make sense of the empirical findings. Together they will form an overarching framework for each case. Re-situating them in their context will eventually enable the researcher to critically reflect on their adequacy. What retroduction is has already been explained in section 3.4. How a retroactive argument is developed is demonstrated in Figure 10 below:

Figure 10: Example of Retroductive Argumentation

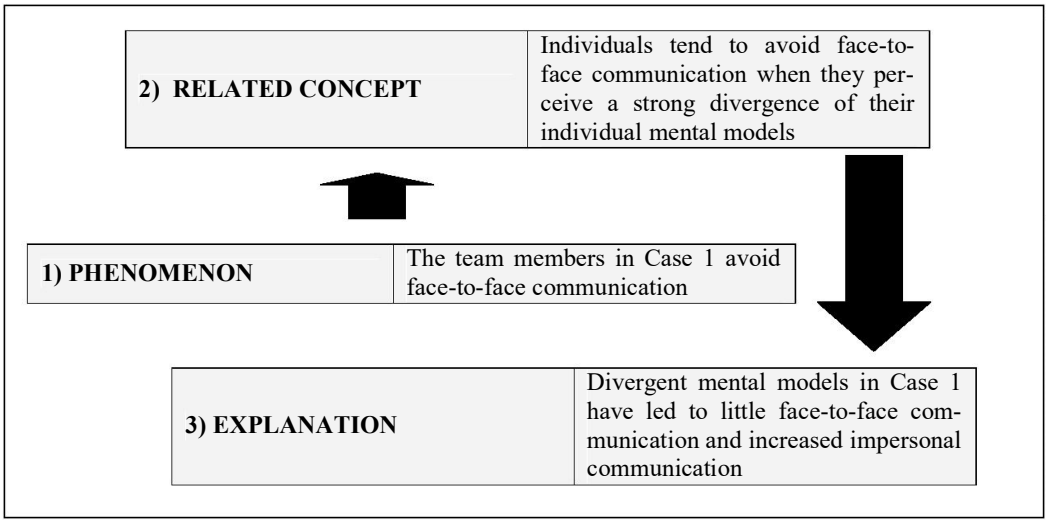


Own Design

Chapter 3 has shown that retroductive reasoning is especially epistemologically suitable for the underlying research philosophy of this work because it combines the strength of an abductive, deductive and inductive reasoning approach. As already mentioned (3.4), this reasoning approach also has a shortfall which lies in its vulner-

ability against fallacies (Ayim, 1974). The example in Figure 11 shows that it could have started with a different concept and thus have led to a different explanation.

Figure 11: Example of Retroductive Fallacy



Own Design

In order to safeguard against such fallacies the researcher has to re-embed his conclusion into the context situation and reflect about its adequacy by using common sense. But as it has already been explained in Chapter 3, a causation that was discovered to guide an action has already contributed to new knowledge. Section 2.4 has given some background information about shared mental models and their importance for entrepreneurial teams and has argued that in addition to their degrees of overlap and their types, their contents are of significant importance. Moreover, research has shown that the quality of teamwork is crucial for entrepreneurial team effectiveness. Hence Druskat's and Pescosolido's (2002) threefold classification of shared mental models for effective self-managed work teams has been identified as being suitable for this project. It has shown in Chapter 5 that as their concept was adapted to the empirical findings, it has provided a useful lens to identify meaningful themes. The following sections 6.2 and 6.3 will use Retroduction to identify various possible mechanisms.

Mechanisms of Case 1

Weak Psychological Ownership

1) Insufficient Time and Support

A first possible mechanism which possibly had contributed to a weak shared model of psychological ownership is reported by Druskat and Pescosolido and describes the difficulty of accommodating new team members. According to Levine and Moreland (1991 in Druskat and Pescosolido 2002), to enable effective socialisation the team has to accommodate a new team member and, in turn, the new team member has to assimilate to the team. They argue that team members, who "*enter a team later without a clear sense of the team charter or a formal opportunity to assimilate, may increase the dissimilarity of shared mental models within a team"* (p. 308). In order to fully accommodate to a new member, time and support is needed.

The team leader in Case 1 had joined the team after formation. In consideration of the relatively short time frame of 3 months for each project, this is considered to be a short time period for a successful assimilation when it occurs without support. Apart from a late accedence, this particular team member then became team leader because no other team member was willing to fulfil this role (the new team leader's subsequent demanding leadership style provides a 2nd explanation for this phenomenon). Moreover in interview extracts this new team member had reported such things as missing team charters and formal opportunities as mentioned above by stating, that role and task allocation within this team were not clearly laid out by the time she had joined.

In addition to and in comparison with Case 2, this team did not have external support from a customer or a client. If, in the second project phase, a business should have been launched this client support had to be gained within the above mentioned time frame. It can not be inferred that this fact had put pressure on the team but it can be derived that it did not reduce any pressure. Eventually, supportive orientation or training sessions with regards to a successful accommodation of new team members could not have been found.

In summary, the discovery of a weak shared mental model of psychological ownership in Case 1, materialised in the discovered phenomena of **little commitment** and **participation** and **cohesion** is explained by an **insufficient new member assimilation and accommodation process** that is needed to successfully adapt to new members.

2) Demanding Leadership

As mentioned above, the second explanation for a weak sense of psychological ownership in Case 1 is related to the leadership situation within the team. In Druskat and Pescosolido's study of longitudinal team projects, a **balance between team ownership and leadership** was difficult to achieve in all projects. In some cases a sense for ownership of team members was for instance facilitated by reduced supervision that fostered team autonomy and control over decisions. On the other hand, some cases with similar conditions had higher levels of ownership. However, all projects which have initially had a high level of ownership have reported that this effect had decreased over time. The right balance between leadership and ownership is obviously difficult to achieve but can be facilitated through an adequate support for instance.

A demanding leadership style was reported in conjunction with a decision the team in Case 1 had to make about whether to transform this project into a business or not. The fact that the project was already in a final phase possibly moved the project leader to speed towards a decision. The interviewed team member in contrast, gave an account of the fact that he felt pressurised by this leadership behaviour. A demanding leadership style is counterproductive for self-managed work teams but to the same extent can generate resistance against team leaders and withdrawals from team actions resulting in **decreased commitment and participation**.

The teams studied by Druskat and Pescosolido (2002) revealed that most notably, it was the external team leaders who frequently tended to over-control which had negative outcomes in relation to models of psychological ownership. Apart from providing a possible explanation for a discovered weak mental model of psychological ownership, the explanation offered underpins the importance of an organisational culture that constantly supports team self-management and new team member assimilation.

3) Power Misuse

Since Lave and Wenger's groundbreaking work on communities of practice (1991), situated learning theory has moved a prevailing understanding of learning from individually-cognitive to socially-situated (especially in education and organisation studies). Firstly, the programme being researched is situated in a community which understands itself as a community of practice in which learning is situated in different programmes and settings. But in addition to this revolutionising notion of learning and its organisational character, Lave and Wenger made a further important notion implying the existence of power in situated learning processes by placing the concept of hegemony over resources in the epicentre of learning (p. 42):

"Hegemony over resources for learning and alienation from full participation are inherent in the shaping of the legitimacy and peripherality of participation in its historical realizations."

Contu and Willmott (2003) for instance argue that this notion of power has long been ignored; suppressed and marginalised, emphasising the challenging and innovative elements of situated learning theory, to the extent that learning practice is always enabled, shaped or even constrained within relations of power. They argue that embedding learning practices into cultural and organisational artefacts automatically exposes them to power relations.

In Case 1 such an exertion of power was expressed by misusing hegemony over knowledge and information and this therefore contributed to situations where decisions were displaced from a team to a dyadic level or where information was not shared openly any more (comp. 5.3.2). However, openly shared knowledge and information are crucial preconditions for team learning and development. The misuse of hegemony over knowledge and information could have been a result of the team leader's personal preference for good relationships as an adjudicating precondition for being able to work together with others. It could also have been a result of the various conflict situations that team members in Case 2 had faced during their development.

4) Diverging Values and Attitudes of Individuals

A first possible mechanism that had possibly generated heedless interrelation can be developed from Byrne (1971), Heider (1958), and Newcomb (1961). Their work deals with the effects of converging and diverging attitudes and values arguing that he similarity of attitudes and values that individuals hold may be important determinants of their ability to interact effectively. When a high concordance exists on attitudinal issues, interpersonal interaction is facilitated; when a low concordance exists, interpersonal interaction is inhibited or can even take the form of hostility.

When applied to the situation in Case 1 this means that the greater the similarities between team members' attitudes and values the better their social interactions. By investigating the contexts in Case 1 dissimilar attitudes between team leader and team member towards learning, in particular reflection and relationships have been discovered **(see Table)**. Interview quotes from the team leader's perspective had revealed a preference for interpersonal relationships, whereas her team mate attached only little importance to this. This divergence of attitudes (towards personal relationships and learning) is a possible underlying force which could have generated the heedless interrelation between team members in Case 1 and could have resulted in conflicting situations which the team was eventually not able to solve itself.

In addition, team members in Case 1 possessed a diverging attitude toward feedback. For one particular team member, feedback was generally seen as something 'good' and useful. In contrast to this, his team leader believed feedback was only useful when it was constructive and hence took it more into account if it was perceived to be more constructive. These diverging attitudes have possibly not only had a negative influence on a shared mental model of heedful social interaction but may even have resulted in team member hostility.

5) Distrust

Trust is an essential element of all social exchange relations and collective actions (Sitkin and Roth, 1993) and one of the most important elements of group or team cohesion (Costa, Roe and Taillieu, 2001). Trust in another team member is for instance crucial when the work of one team member is continued by a different team member but finally both team members are jointly responsible for its outcomes (Webber, 2002). However, not only task related trust is important. The same applies to trust towards team norms, team behaviours and interactions, since trust implies the vulnerability of individuals (Lencioni, 2005). Hence trust development between team members especially in early stages of team formation, is a key contributor to fostering social interaction. Distrust however is counterproductive for effective teamwork.

Sitkin and Roth (1993) have researched legalistic mechanisms to remedy trust related problems concluding that legalistic remedies are ineffective in restoring trust. In their approach they distinguish between two dimensions of trust: task specific reliability and value congruence, and state that legalistic mechanisms respond only to reliability concerns whilst ignoring value-related concerns. Their work indicates that:

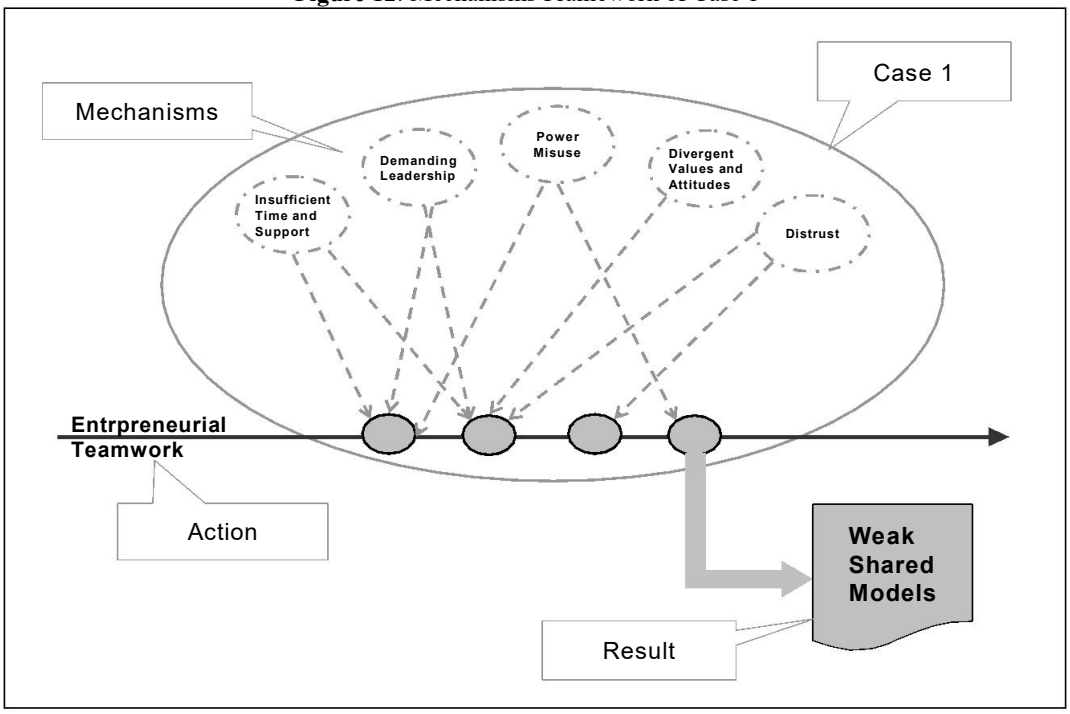
"Distrust is engendered when an individual or group is perceived as not sharing key cultural values" (Sitkin and Roth, 1993, p.371).

Chapter 5 has revealed diverging cultural values of team members. The notion of culture is obviously more important for the team member than for the team leader. The team member believes that culture demands responsibility and is engaged in board meetings in order to change the programme culture. Realising that his cultural values are not being shared by his team mates has possibly generated distrust and has therefore triggered heedless behaviour. It is important to mention that the above explained effect has to be considered for other team members of Case 1 as well.

In summary, the above reasoned mechanisms are believed to have triggered the prevailing team situation in Case 1. Together they form a framework of mechanisms and explain how the phenomena discovered in Chapter 5 could have been generated. This framework of mechanisms is presented in Figure 12Figure 12 below. Section 6.3 de-

velops the mechanisms for the situation of Case 2 in an analogous, way and presents a second mechanism framework. In Chapter 7 these two frameworks will be summarised and a conclusion will be drawn from the findings and mechanisms of each case.

Figure 12: Mechanisms Framework of Case 1



Adapted from Pawson and Tilley (1997)

Mechanisms of Case 2

Strong Psychological Ownership

1) Target Attractiveness

In section 2.4, psychological ownership has already been defined as a phenomenon where an individual develops possessive feelings towards a tangible or an intangible object (or target). In the case of entrepreneurial teams, shared mental models of ownership describe possession towards a project and its tangible and intangible assets.

According to Pierce, Kostova and Dirks, 2002, such a target as described above, at minimum has to be discernable and attractive to an individual as well as being experienced and capturing the interest or attention of an individual. Generally, targets that are able to fulfil the three basic human needs of home (or having a place), self-identity, efficacy and effectance, are good targets for psychological ownership.

The question of why Case 2 is such an attractive target of psychological ownership has various explanations. In Case 2, high attractiveness stems firstly from the interest of an external client which exists from almost the beginning of the project. As already explained (sections 5.4.2 and 5.4.3) the team had been shown interest from a considerably large fashion firm that was keen to support the project. The fashion firm has subsequently confirmed their intention to work with the group. A second area of attractiveness could have emerged from the friendship-like relationships that the team members developed over time. These relationships are the subject of a further explanation that could lead to the 3rd mental model (Heedful Interrelation) and which will be explained in detail subsequently. A further attractiveness could have stemmed from the flat hierarchies and a last attractiveness from the team's ability to handle team processes (including leadership) in a playful and democratic way. All these factors similarly enhance target attraction and thus team satisfaction.

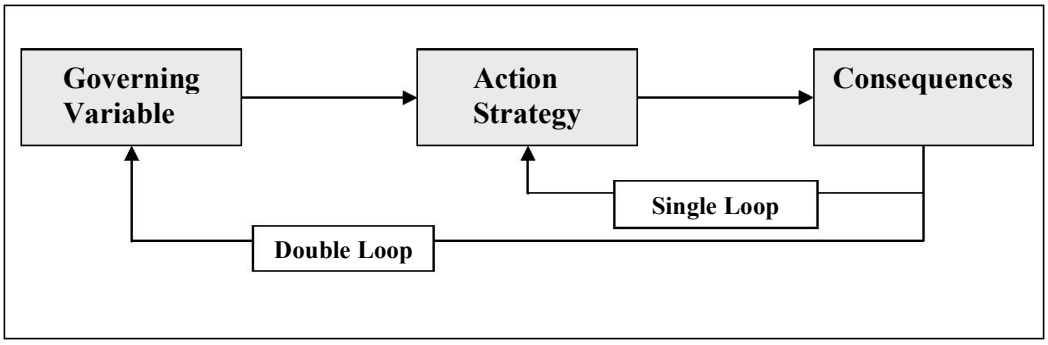
These four sources of attractiveness presented: **external support, good relationships, democratic processes and playful interaction**s, do not assure a high target of attractiveness but considerably enhance its attractiveness in comparison to the attractiveness in Case 1. It is important to mention that although psychological ownership is not the only important dimension, target attractiveness is seen as an important precondition.

Continued Learning

2) Double Loop Learning

The following will explain why the next mechanism that had enabled the team in Case to continuously learn and flexibly adapt is presumably Double Loop Learning. Argyris and Schoen's (1978) concept of double loop learning is presented in Figure 13:

Figure 13: Double Loop Learning



According to Argyris and Schoen single loop learning involves the detection of an error and the subsequent alteration of the action (or strategy) in order to avoid this error in a following loop. In other words, existing goals, values and plans are operationalised differently in order to regulate a defective system. Radiator thermostats for instance use single loop learning to regulate heat. In order to maintain a certain temperature they turn on or off depending on the temperature information they receive.

Double loop learning on the other hand involves stepping further back, questioning the governing variables themselves and making them subject to a scrutiny that may lead to their alteration. This may lead to a shift in which strategies and consequences are framed. Whereas single loop learning often occurs when things are taken for granted, double loop learning implies a greater level of reflection and creativity. Argyris and Schön explain that in this sense any reflection is aimed to make a strategy more effective. Single loop learning is less risky for individuals and organisations and allows greater levels of control. In double loop learning, basic ideas, ideologies and policies are confronted and questioned. Argyris and Schön furthermore argue that:

"Double-loop-learning is necessary if practitioners and organisations are to make informed decisions in rapidly changing and often uncertain contexts" (Argyris 1982; 990)

This quote demonstrates the importance of a double loop learning mechanism for entrepreneurial teams since they exclusively operate in such uncertain contexts as mentioned above. Double loop learning in Case 2 is possibly the explanation for a high team flexibility and adaptability to situations where the team had to compensate team members or even its team leader. In Chapter 5 this substitution of team members was reported from different perspectives within the team to happen unproblematically and in considerably creative way. The team leader for instance was simply compensated by two team members who jointly took over one team role. In a different interview extract team members reflected about feedback situations and questioned whether or not they gave themselves enough critical feedback (see section 5.4.3). Once again in a further situation during an interview, a team member had reflected about recent team developments and about an existing anxiety to exclude another team member which eventually did not happen.

By reflecting about situations, behaviours and themselves, the team members in Case 2 had obviously learned continuously and were, compared to the team members in Case 1, able to cope with uncertain situations in a much better way.

Heedful Interrelation

3) Friendship

A mechanism that had possibly triggered the uncovering of heedful behaviours in Case 2 is friendship. Recent research on friendship within management teams and its association to team behaviours has discovered that friendship facilitates team formation, is conducive to decision making, helps to solve problems and enhances venture performance (Francis and Sandberg, 2000). The potential effects that friendship can have are its affective outcomes. Friendship, once established, can influence a group's dynamics and behaviours by holding a team or a group together when, for instance, it undergoes difficult times. This is inter alia reflected in Rusbult and Van Lange's work (1996) that discovered greater levels of trust and commitment in teams with friendships relations.

Yet interpersonal relationships are based on knowledge about individuals which lies beyond knowledge about their formal roles. Greater informal knowledge about an individual increases the predictability of an individual's behaviour and thus enables the development of greater trust in a person. Furthermore, friendship is governed by rules that guide the above mentioned behaviours and is a voluntary and unconstrained (informal) interaction. Friendship was often conceptualised dichotomously (between two individuals) but can also be understood as a group or a team phenomenon (Krackhardt, 1995). According to Francis and Sandberg (2000), the impacts that friendship can have on an entrepreneurial team, effect self-disclosure and trust as well as the effects of greater interaction and cooperation within a team. Francis and Sandberg propose 13 potential relationships between friendship and entrepreneurial teamwork. These 13 potential relationships happen on 4 different dimensions: Team Formation, Team Functioning, Team Stability, and Team Performance. Some of these relations are related to an entrepreneurial team's formation phase:

"Higher levels of friendship lead a founding team to rely more on implicit agreements and less on explicit, written contracts in establishing their venture."

It was reported in Case 1 that in the beginning of the project the idea of formal feedback minute sheets for taking notes in meetings was existent. It was explained that this idea has been rejected because feedback sheets were irreconcilable with the way this team handled feedback situations and meetings.
A second applicable proposition is related to team functioning:

"Higher levels of friendship within a venture team at the outset of a strategic decision will promote a more effective decision-making process, thus resulting in a higher quality decision, greater commitment to it, greater understanding of it, and greater affective acceptance of fellow team members and the team's processes."

The team phenomena discovered in Case 2 have predominantly given accounts of democratic and effective decision making processes apart from some situations where teamwork seemed to have unproductive outcomes. It is not easy to make a declaration about the quality of team decisions but it is assumed that the quality of the decisions

made was considerably high. Finally, commitment within the team and effective acceptance of fellow team members and team processes were traceably high.

"Higher levels of friendship within a venture team at the outset of a strategic decision will result in greater participation by individual team members in that decision."

Even this proposition can be verified. Practically all decision making processes in Case 2 were accompanied by high attendances of team members and high levels of participation.

"Friendship within an entrepreneurial team is negatively related to subsequent turnover among the team."

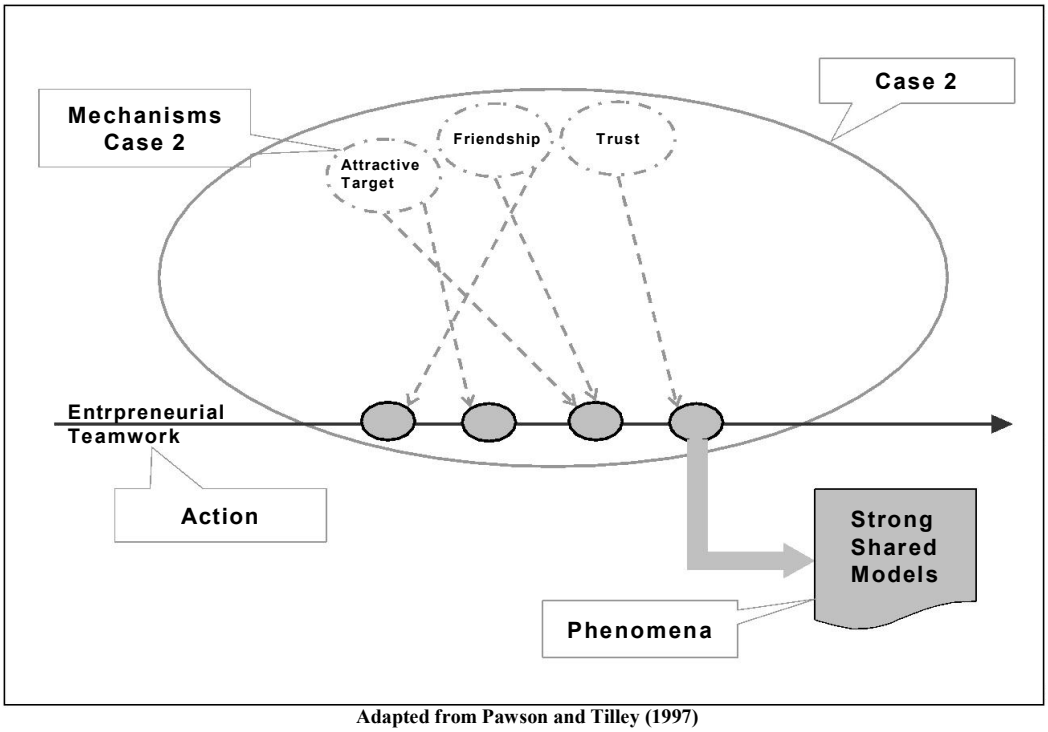
The fact that the team in Case 2 is the only team which still works in the same composition as in the beginning whereas all other teams of this programme generation have changed their composition, coincides with the above given negative relation, leading to the proposition that friendship is the mechanism that led to this phenomenon.

"Higher levels of friendship during the formation of a venture team will be positively related to the subsequent performance of the venture."

The ultimate proposition suggests that a high level of friendship is positively related to a team's subsequent performance which, likewise applies to Case 2. From the 13 propositions made by Francis and Sandberg (2002) five were applicable to the situation of Case 2. Amongst the eight missing propositions, four were not at all related to this team's particular situation and the last remaining four could not be verified because their content had not been researched. More than half of the relevant proposed effects of friendship could be found. Together with the fact that a team member declared that, within the team, communication is like communicating with friends, it can be safely assumed that the existence of friendship-like bonds is one possible mechanism that has triggered Heedful Interrelations in Case 2.

Francis and Sandberg also found that friendship within teams can either improve or impair venture performance, which is a further possible explanation for the unproductive outcomes and the difficulties that team members have occasionally had when it came to criticising team mates. All in, the team in Case 2 excelled all the other 7th generation teams which leads to the conclusion that the positive effects of friendship outbalance the negative effects in Case 2. Target **attractiveness, double loop learning and friendship** have been discovered to be the possible underlying mechanisms which have generated the phenomena that occurred in Case 2 (see Figure 14).

Figure 14: Mechanisms Framework of Case 2



Adapted from Pawson and Tilley (1997)

Summary of the Mechanisms

Five underlying mechanisms have been developed which could possibly have triggered the phenomena in **Case 1**

- Insufficient Time and Support
- Demanding Leadership
- Power Misuse
- Diverging Values and Attitudes of Individuals
- Distrust

Together these constitute a framework of mechanisms, which **impedes** the development of the desired models. **Case 2** has presented three further possible mechanisms:

- Target Attractiveness
- Double Loop Learning
- Friendship

Together these mechanisms constitute a framework that **facilitates** the desired models.

Enhancing the Quality of Entrepreneurial Teamwork

It has been argued in Chapter 2 that the greater the existence and overlap of the three core models of effective self-managed work teams (ownership, learning and interrelation) the higher the quality of teamwork and the more effective a team. By linking the mechanisms discovered in this Chapter to an integrative concept, we can thus create a concept that facilitates these desired teamwork phenomena, and impedes the undesired. It will be more comprehensive and thus more effective in its deliberation to improve the quality of entrepreneurial teamwork and subsequently, team effectiveness.

However, the findings have shown that the underlying mechanisms of Case 1 act contrary to the development of the desired, shared mental models for effective self-managed teams and it is assumed that a minimisation of these mechanisms or an impact of reciprocal acting mechanisms would have an adverse effect. In other words:

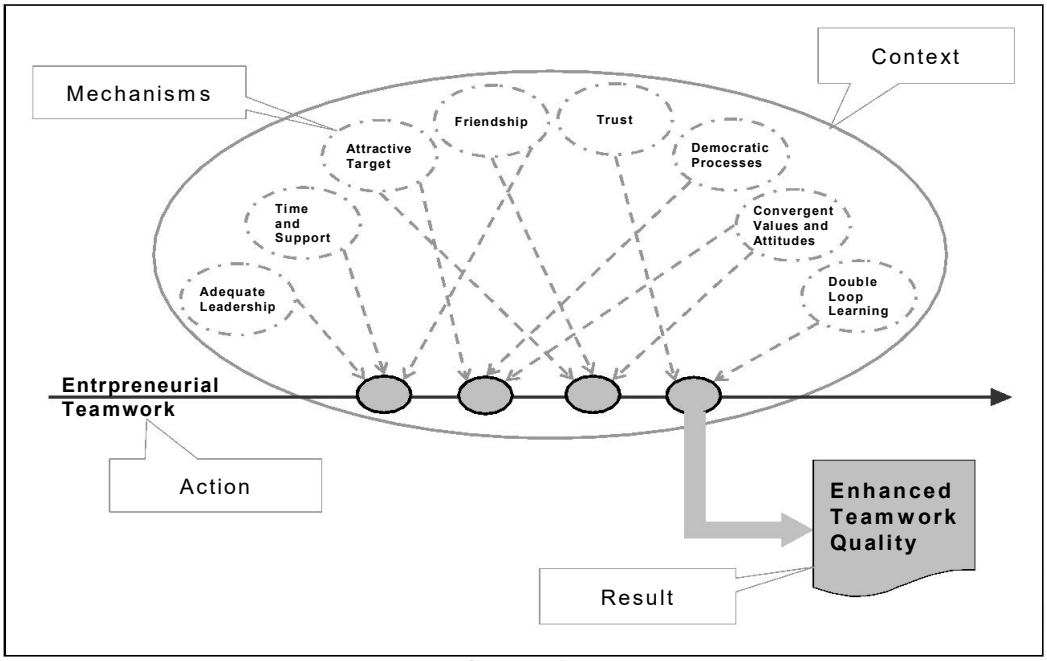
- Insufficient Time and Support
- Demanding Leadership
- Power Misuse
- Diverging Values and Attitudes of Individuals
- Distrust

have to be minimised or reversed into:

- Enough Time and Support
- Adequate Leadership
- Democratic Processes
- Convergent Values and Attitudes
- Trust

Together with the mechanisms of Case 2, they form an integrative framework for enhanced teamwork quality which is presented in Figure 15Figure 15 below:

Figure 15: Integrative Concept of Enhanced Teamwork Quality



Own Design

Chapter 7 will summarise and conclude the results of this project, give practical recommendations for an application, discuss the limitations and make implications for further research.

Conclusion

Introduction

A prevailing problem in entrepreneurship practice is the need to combine heterogenic competences in entrepreneurial teams in order to handle the considerably high levels of uncertainty and complexity of innovation processes. In order to carry out successful innovation projects, these teams have to find a way of working together effectively and as fast as possible. Since teams consist of beings and teamwork is dependent on the interaction between these beings, the **quality of social interaction within entrepreneurial teams** is seen to be crucial for effective and successful teams.

As a consequence the entrepreneurial teams researched used Prototyping, the iterative development of haptic innovation models with the collection of feedback, to reduce these levels of uncertainty and complexity and to facilitate and support their innovation processes. Recent research has investigated whether Prototyping has further potential to directly influence the quality of social interactions within entrepreneurial teams and thus to positively support innovative projects on various dimensions.

Derived from this problem, it is the aim of this project to understand and explain the phenomena of social interaction of young entrepreneurial teams in their early stages of team development, because levels of uncertainty and complexity are considerably high at this point. To understand and explain these phenomena and their causalities will be beneficial for any future attempts to develop the quality of teamwork.

Concluding the Results of this Project

In order to achieve this goal, Chapter 2 has presented a theoretical background of Entrepreneurship, Innovation, Prototyping and Shared Mental Models as the underlying concept of Prototyping. Since research about entrepreneurial teamwork has largely

been focused on particularly structural dimensions and the intention of this project is to gain insight into the social dimensions of entrepreneurial teamwork phenomena, a theoretical review of existing structural teamwork models was abandoned. Further concepts and theories of social exchange were also abandoned as this work did not want to build upon any existing concepts of social exchange but instead aimed to deliver new insight into occurring phenomena and possible causalities. But these aforementioned interrelations certainly have to be considered if the intention is to transfer these insights into practice, or built upon the research results of this study.

Since shared mental models are the fundamental underlying concept of Prototyping, the literature chapter instead proposed to view this work through a more comprehensive concept of shared mental models which, beside their existence and their degree of overlap, also considers their contents. It is argued that shared mental models for effective self-managed work teams should have the following **contents:**

(1) Psychological Ownership
(2) Continuous Learning
(3) Heedful Interrelation

The hypothesis of this concept is that teams which possess strong shared mental models with the above mentioned contents work together more effectively. The existence of these three models is indicated by the following factors. **Indicators:**

- High levels of Commitment and Participation for **(1)**
- A Serious Approach to and Interest in Learning for **(2)**
- Attentive, Purposeful and Conscientious Behaviour for **(3)**

Since the entrepreneurial teams researched predominantly work in a self-managed way, this concept has been found to be particularly useful for this project.

Chapter 3 has explained critical realism, the underlying research philosophy of this work, which although believing in the existence of one objective reality, argues that knowledge which can be gained about this reality is relatively dependent on an indi-

vidual's perspective and context. As a consequence of this, Pawson and Tilley's Context-mechanism-phenomena Conceptualisation was chosen to connect the action (programme) with its context (a situation), the mechanisms (invisible powers) and the emerging phenomena (or results). When operationalised within this particular context these mechanisms can trigger the phenomena. Whereby the action, the context and the phenomena are visible, the underlying mechanisms lie within an individual's subjective perception of reality but can be developed by means of retroductive reasoning. This approach was chosen due to its suitability for critical realism philosophy.

In Chapter 4 the qualitative research paradigm of this work was presented and explained. By means of a document analysis, observations and 4 in-depth interviews the contexts and phenomena of two Comparative Cases of one successful and one unsuccessful example of entrepreneurial teamwork have been researched and analysed.

Chapter 5 could, by applying Pawson and Tilley's concept, identify contexts and phenomena (the above mentioned indicators) for a strong existence of these desired models in the successful case and a weak existence in the unsuccessful case.

The Phenomena (Indicators) of Case 1

(1) Low Commitment and Participation
(2) Misuse of Hegemony, Unconsidered Feedback
(3) Conflicts, Impersonal Communication, Negatively influenced Decisions

Shared Mental Models of Case 1

- Weak Psychological Ownership
- Discontinued Learning
- Heedless Interrelation

The Phenomena (Indicators) of Case 2

(1) High Cohesion and Commitment, Good Relationships, Democratic Leadership
(2) Democratic Decision Making, Little Critical Feedback
(3) Good Flexibility, Good Adaptability, Extensive Face-to-Face Communication

Shared Mental Models of Case 2

- High Psychological Ownership
- Continuous Learning
- Heedful Interrelation

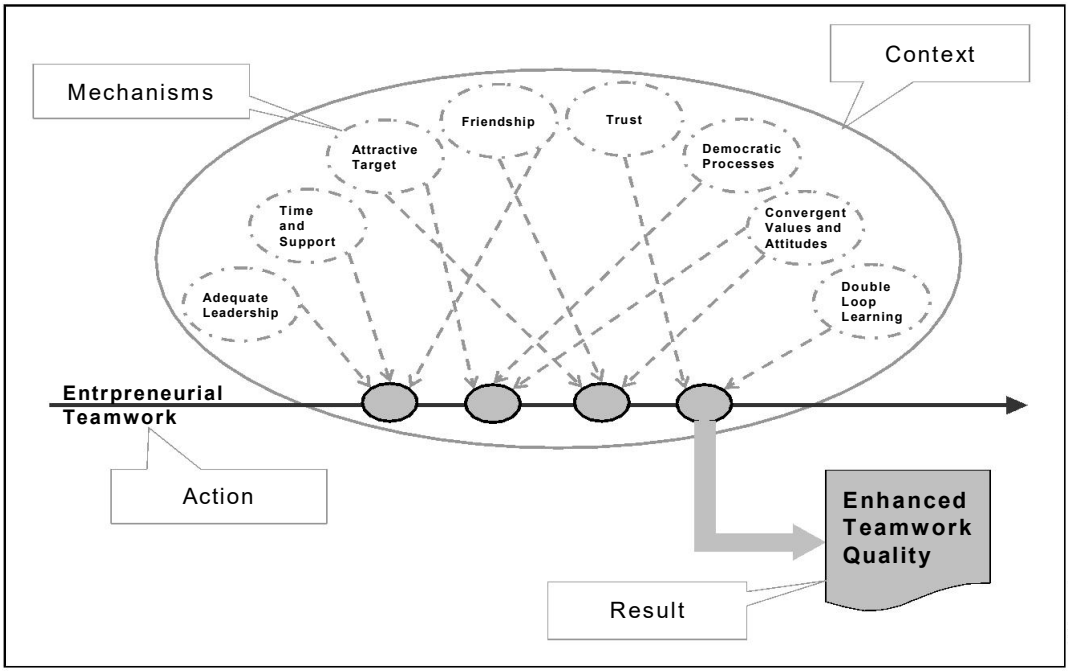
The mechanisms developed in Chapter 6 have possibly triggered these phenomena (or indicators) and have generated the desired or undesired models, which have been combined to an integrative Concept for Enhanced Teamwork Quality (Figure 16).

Concept for Enhanced Teamwork Quality

- **Enough Time and Support**
- **Adequate Leadership**
- **Democratic Processes**
- **Convergent Values and Attitudes**
- **Trust**
- **Target Attractiveness**
- **Double Loop Learning**
- **Friendship**

It is believed that support of the above mechanisms enhances the quality of entrepreneurial teamwork and thus their effectiveness. The following section will give practical recommendations about how to support, foster and maintain these mechanisms.

Figure 16: Enhanced Entrepreneurial Teamwork Quality



Own Design

Practical Recommendations

The following practical recommendations are a synthesis of the empirical results of this work and the theoretical recommendations that Druskat and Pescosolido have derived from their analysis of four longitudinal studies of self-managed work teams. This has been done for two reasons. Firstly, it is argued that contrasting and synthesising a theoretical and practical perspective has enabled a critical reflection about this work in Chapter 8. Secondly, stronger recommendations are delivered because either accordances or aberrances can be identified which can then be understood and explained. The synthesis of recommendations from different origins delivers more comprehensive and thus more strengthened, practical recommendations.

Druskat and Pescosolido firstly note that for the most preferable result possible, all 3 models (ownership, learning, heedful interrelation) should be developed as early in a team's history as possible for various reasons. One reason is that the later a team goes through its developmental stage, the higher the levels of uncertainty and complexity.

In relation to the results of this project, this means that the triggering of the 8 discovered mechanisms which are believed to support the development of the desired models and hence an enhancement of the quality of teamwork, should be supported as much as possible and as early as possible.

Druskat and Pescosolido furthermore suggest that apart from **organisational support**, factors in a team's context like **culture** have a strong influence on the development of these models. It is thus of vital importance to have the **appropriate organisational culture** that supports the above developed mechanism concept and that **organisational support** in the form of **learning opportunities such as preparation and orientation sessions**, **support sessions** and **training sessions** and the possibility of from teams **self-initiated sessions** are enabled.

This means in relation to this project that the organisational culture in which this programme is embedded should support the above mentioned mechanisms and that adequate learning opportunities and training sessions are being established which support all developed mechanisms in order to enhance Teamwork Quality.

Limitations and Further Research

This project has sought to gain insight into the phenomena of social interaction of entrepreneurial teams and has thereby used a qualitative and comparative Case Study to achieve this objective. The results of this research project cannot be generalised due to its limited scope. Further research could undertake a similar effort with a bigger sample and include quantitative research methods or a combined (triangulation) approach. Further limitations can be found in the results of this project. As explained in the research philosophy, the framework of this project represents one view of the phenomena researched. As explained in Chapter 6 it is furthermore not assured that retroduction has delivered unambiguous results. Critical is further that the results of this work are neither collectively exclusive nor mutually exhaustive. A different research attempt could identify more or different mechanisms compared to the mechanisms discovered in this project. But as it has been mentioned, critical realists believe that:
As long as the gained knowledge is sufficient enough to effectively lead actions it, has made a valuable contribution in its attempt to gain new insight.

Further research projects could undertake similar projects within various contexts or conduct a similar project using different methods and compare the results with this work. In addition, further research could also build on this project and try, by means of an inductive approach, to discover more mechanisms to enhance entrepreneurial teamwork quality or, by means of a deductive approach, test a hypothesis.

Critical Reflection

The objective of this chapter is to critically reflect on this project and hence learn from its process, its writing up and its results. Learning from reflection has already been explained by means of Argyris' and Schön's Double Loop Learning Theory. Thus learning within this research project has occurred on three different dimensions:

(1) Learning about the research process
(2) Learning about the writing process
(3) Learning about the results of this work

(1) Learning about the research process

A time frame of 3 months for a masters dissertation including the gathering of primary data through empirical research and with a scope of 20.000 words is, although it seems to be sufficient, relatively short. Such a project should be well planned and organised in advance and the data should be conducted rigorously. A successful undertaking of this research project without support from the research site, the department and the various people who had given feedback during the paper's write up would most certainly have made it impossible to finish it within this time frame.

(2) Learning about the writing process

When a researcher considers gathering qualitative primary data, a considerable amount of time consuming data analysis and processing should be considered. The gathering of the data mentioned above had lasted a month and thus used a third of the total time allocated for the project. The analysis of 50 pages of qualitative interview data required more than 2 weeks. 6 weeks were then left for writing up which was also a considerably short amount of time. But although the obstacles, the resultant process of writing up this paper sharpened the understanding of how to successfully plan, structure and write up an academic piece of work.

(3) Learning about the results of this work

The results have shown that the social interactions of entrepreneurial teams in particular are highly complex and difficult to realise. Even a rigorously implemented approach does not prevent a researcher from fallacies and errors. Nevertheless the attempt to explain the teamwork phenomena that occurred has increased the awareness of possible behaviours that can occur in entrepreneurial teamwork projects and latent mechanisms that might be behind them. This is certainly beneficial to better understand and design such entrepreneurial teamwork programmes and to design adequate support systems to achieve better results. Resulting from the outcomes of this project, some key imperatives to a more successful developmental programme are:

- A sound understanding of the Programme
- A sound understanding of the Social Interactions of Teams
- A strong Programme Culture that supports the Aims of the Programme
- Strong Learning Support in the form of Constantly Continuing Education

References

Abernathy, W.J. and Utterback, J.M. (1978): Patterns of Innovation, *Technology Re view, 14 (1).*

Ansoff H.J. and Stewart J.M. (1967): Strategies for a technology based business. *Har vard Business Review, November-December 71-83.*

Archer M, Bhaskar R, Collier A, Lawson T, Norrie A (1998): *Critical Realism: Essen tial Readings*, Routledge, London.

Ardichvili A, Cardozo R, Ray S. (2003): A theory of entrepreneurial opportunity iden tification and development, *Journal of Business Venturing*, *18, S. 105-123.*

Argyris, C. & Schön, D. (1978): *Organizational learning: A theory of action perspec tive*, Reading, Mass: Addison Wesley.

Argyris, C. (1982): *Reasoning, learning, and action: Individual and organizational*, San Francisco: Jossey-Bass

Argyris, C. (1990): *Overcoming Organizational Defenses. Facilitating organizational learning,* Boston: Allyn and Bacon.

Ayim, M. (1974): Retroduction: The rational Instinct, *Transactions of the Charles S. Peirce Society, Vol. 10 Issue 1, p34, 10p.*

Bolden, R. (ed.) (2005): *What is Leadership Development: Purpose and practice*. LSW Research Report, Centre for Leadership Studies, University of Exeter.URL: [www.leadership-studies.com/lsw/lswreports.htm].

Bryman, A. (2004) (second ed.): *Social Research Methods*, Oxford University Press, New York.

Buenstorf, G. (2007): Creation and Pursuit of Entrepreneurial Opportunities: An Evo lutionary Economics Perspective, *Small Business Economics, 28, S. 323-337.*

Burrell, G. (2001): *Sociological Paradigms & Organisational Analysis*, Ashgate Pub lishing Limited.

Byrne, D. (1971): *The attraction paradigm*. New York: Academic Press.

Salas E. and Converse S. (1995): *Shared Mental Models in Expert Team Decision Making,* In N.J. Castellan Jr. (Ed): Individual and Group Decision Making, NJ Erlenbaum, pp. 221-246.

Cantillon, R. (1759): *Essai sur la Nature du Commerce in Général*. Edited with an English Translation and other material by Henry Higgs, C.B. 1959 (Reissued for the Royal Economic Society. First published by Macmillan 931.1 & Co. Ltd in

Casson, M.C. (1982): *The Entrepreneur: An Economic Theory*, Oxford: Martin Robertson, 2nd. Ed. Edward Elgar, 1999.

Contu, A. and Willmott, H. (2003) Re-Embedding Situatedness: The Importance of Power Relations in Learning Theory, *Organisation Science*, *14, 3, 283-296.*

Costa A.C, Roe R.A, Taillieu T. (2001): Trust within teams: The relation with per formance effectiveness, *European Journal of Work and Organisational Psychology, 2001, 10(3), 225–244.*

Crawford C.M. (1980): *Defining the charter for product innovation*. *Sloan Manage ment Review*, fall 3-12.

Crawford C.M. (1994): *New Products Management*, 4th Edition, Boston: Richard D. Irwin, Inc.

Cross, N. and Cross, A. C. (1995): Observations of teamwork and social processes in design, *Design Studies, 16, S. 143-170.*

Cussens J. (1996): Deduction, Induction and Probalistic Support. *Synthese*: *1–10.*

Davison, G. and Blackman, D. (2005): The role of mental models in innovative teams, *European Journal of Innovation Management, 8 (4), S. 409-423.*

De Propris, L. (2002): Types of innovation and inter-firm co-operation *Entrepre neurship & Regional Development, Vol. 14 Issue 4, p337-353, 17p.*

Denzau A.T. and North D.C (1994): Shared Mental Models: Ideologies and Institu tions, *Kyklos, Volume 47 Issue 1 Page 3-31.*

Denzin, N.K. and Lincoln, Y.S. (2005) (Eds) (third ed.): *The Sage Handbook of Qualitative Research*, Sage Publications Limited, London.

Doll, B. (2007): *Prototyping als Instrument zur Unterstützung sozialer Interaktion sprozesse bei Gründerteams in kundenintegrierenden Innovationsexperimenten*, 4th Conference „Theory and Practice of Entrepreneurship", Alpen-Adria University Klagenfurt, Austria.

Dreier, C. (2001): Gründerteams: *Einflussverteilung - Interaktionsqualität – Unterneh menserfolg*, Technische Universität Berlin.

Drucker, P. (1985): *Innovation and entrepreneurship*. New York: Harper & Row.

Druskat V.U. and Pescosolido A. (2002): The content of effective teamwork mental models in self-managing teams: Ownership, learning and heedful interrelating, *Human Relations, Vol. 55, No. 3, 283-314*

Easterby-Smith M., Thorpe R. and Lowe A. (2002): *Management Research: An Intro duction,* 2nd edn, Sage, London.

Easton, G. (2000): *Case research as a method for industrial networks: A realist apolo gia*, in Ackroyd, S. and Fleetwood, S. (eds), *Realist Perspectives on Management and Organisations*, Routledge, London.

Eisenhardt, K.M. (1989): Building theories from case study research. *Academy of Management Review, 14: 532-550.*

Erickson, T. (1995): *Notes on design practice: Stories and prototypes as catalysts for communication*, in: Carroll, J. (Hrsg.): Scenario-based design: envisioning work and technology in system development, New York: John Wiley & Sons, S. 37-58.

Fagerberg, J. (2003): *Innovation: A Guide to the Literature*, in Fagerberg, Jan, David C. Mowery and Richard R. Nelson: *The Oxford Handbook of Innovations*. Oxford University Press, 1-26.

Francis D.H. and Sandberg W.R. (2000): Friendship Within Entrepreneurial Teams and its Association with Team and Venture Performance, *Entrepreneurship Theory and Practice, 25(2), 5-26.*

Gartner W.B. (1985): Who is an entrepreneur? Is the wrong question, *Entrepreneur shiptheory and, 1988 vol: 12, iss: 4 pg: 11.*

Gephart P. (1999): *Paradigms and Research Methods*, Research Methods Forum, Vol. 4.

Goldhar J.D., Bragaw L.K. and Schwartz J.J. (1974): Information flows, management styles and technological innovation. *IEEE Transactions on Engineering Management*, *EM 23.*

Harel, I. and Papert, S. (1991): *Constructionism,* Norwood: Ablex Publishing Corpo ration.

Harrison, D. and Easton, G. (2004): *Temporally embedded case comparison in Indus trial marketing research*, in Fleetwood, S. and Ackroyd, S. (eds), *Realism in action in management and organisation studies*, Routledge, London.

Heider, F. (1958): *The psychology of interpersonal relations*, New York: Wiley.

Herstatt, C. and Verworn, B. (2003): *Management der frühen Innovationsphasen*, Wiesbaden, Gabler.

Högl, M. and Gemünden, H. G. (2001): Teamwork Quality and the Success of Innova tive Projects: A Theoretical Concept and Empirical Evidence, *Organization Science, 12 (4), S. 435-449*.

Jessop B. (2001): *Critical Realism and Marxism*, London: Routledge.

Jessop, B (2005): Critical Realism and the Strategic-Relational Approach, *New For mations*, *Volume 56, Number 1, pp. 40-53.*

Holland J.H, Holyoak K.J, Nisbett R.E, and Thagard P.R. (1986): *Induction: Proc esses of Inference, Learning, and Discovery*. Cambridge, MA: The MIT Press.

Johnson-Laird, P.N. (1983). *Mental Models: Towards a Cognitive Science of Lan guage, Inference, and Consciousness*. Cambridge, MA: Harvard University Press.

Kelley, T. (2001): Prototyping is the Shorthand of Design, *Design Management Jour nal, 12 (3).*

Kelley, T. (2002): *The Art of Innovation: Lessons in Creativity from IDEO*, *America's Leading Design Firm*, New York: Doubleday/Random House.

Kelly, J. R. and Spoor, J. R. (2005): *Affective influence in groups*, 8th Annual Sydney Symposium of Social Psychology, March 14-17, 2005, Sydney, Australia.

Kirzner I. M. (1976): *The Economic Point of View: An Essay in the History of Eco nomic Thought*, Kansas City: Sheed and Ward, Inc.

Klandt H, Koch L.T, Knaup U, (2005): FGF Report. *Entrepreneurship Professuren 2004* - Eine Studie zur Entrepreneurshipforschung- und lehre an deutsch sprachigen Hochschulen.

Kleinschmidt E.J. and Cooper R.G. (1991): The impact of product innovativeness on performance, *Journal of Product Innovation Management*, *8:240-251.*

Kline, S.J. and N. Rosenberg (1986): *An Overview of Innovation*, in R. Landau and N. Rosenberg (eds.) The Positive Sum Strategy: Harnessing Technology for Economic Growth, Washington D.C.: National Academy Press, pp. 275-304.

Knight, F.H. (1921): *Risk, Uncertainty, and Profit,* Boston, MA: Hart, Schaffner & Marx, Houghton Mifflin Company.

Krackhardt, D. (1995): Entrepreneurial opportunities in an entrepreneurial firm: A structural approach. *Entrepreneurship Theory and Practice, 19(3), 53-69.*

Lave J. and Wenger E. (1991): *Situated Learning. Legitimate peripheral participation*, Cambridge: University of Cambridge Press

Lawson, C. (2004): *Competence theories*, in Fleetwood, S. and Ackroyd, S. (eds), *Re alism in action in management and organisation studies*, Routledge, Lon don.

Lechler, T. (2001): Social Interaction: A Determinant of Entrepreneurial Team Ven ture Success, *Small Business Economics*, *16, S. 263-278.*

Lechler, T. and Gemünden, H. G. (2003): *Gründerteams*, Heidelberg: Physica-Verlag.

Keuscher, T. (2007): Phenomena of Social Interaction in Entrepreneurial Teamwork (unpublished Master thesis), Lancaster University Management School.

Lee, M. and Na, D. (1994): Determinants of technological success in new product de velopment when innovative radicalness is considered. *Journal of Product Innovation Management*, *11:62-68.*

Leibenstein H. (1968): Entrepreneurship and Development, *The American Economic Review*, *Vol. 58, No. 2*, Papers and Proceedings of the Eightieth Annual Meeting of the American Economic Association.

Lencioni, P. (2005): *Overcoming The Five Dysfunctions of a Team: A Field Guide for Leaders, Managers and Facilitators*. San Francisco, CA: Jossey-Bass.

Lichtenstein B.B, Carter N.M, Dooley K.J, Gartner W.B (2007): Complexity dy namics of nascent entrepreneurship, *Journal of Business Venturing*, *22 (2), S. 236-261.*

Lycan, W.G., (ed.). (1999). *Mind and Cognition: An Anthology*, 2nd Edition. Malden, Mass: Blackwell Publishers, Inc.

March, J.G. and Simon H.A. (1993): *Organizations*, Cambridge Press, Blackwell.

Mascitelli, R. (2000): From experience: Harnessing tacit knowledge to achieve break through innovation, *Journal of Product Innovation Management, 17, S. 179-193.*

Mathieu J, Goodwin G. F, Heffner T. S, Salas E, and Cannon-Bowers J.A, (2000): The influence of shared mental models on team process and performance. *Journal of Applied Psychology*, 85(2): 273-283.

Meka R, Schultz B, Anclam S, Beaucamp A. (2005): *Wissens- und technologieorien tiertes Gründungsgeschehen* - Kienbaum-Bestandsaufnahme für eine Weiterentwicklung von EXIST, Bundesministerium für Bildung und Forschung, online: http://www.bmbf.de.

Meyers, P.W. and Tucker, F.G. (1989): Defining roles for logistics during routine and radical technology innovation. *Journal of Academy of Marketing Science, Vol 17 No 1, pp 73-82.*

Murphy, P. J., Liao, J., & Welsch, H. P. (2006): A conceptual history of entrepreneu rial thought. *Journal of Management History*, *12(1), 12-35.*

Newcomb, T. M. (1961): *The acquaintance process*. New York Holt, Rinehart & Winston.

Nyström H. (1985): Product Development Strategy: An Integration of Technology and Marketing. *Journal of Product Innovation Management 2 (1), 25–33.*

Pawson, R. and Tilley, N. (1997): *Realistic Evaluation*, Sage, London.

Pearson, A. W. (1990): Innovation strategy, *Technovation*, *10 (3), S. 185-192*.

Penrose, E. G. (1959): *The Theory of the Growth of the Firm*.177, Wiley, New York.

Picot A, Laub U.-D, Schneider D. (1989): *Innovative Unternehmensgründungen: Eine betrieb wirtschaftliche Analyse*, Berlin.

Pierce J. L., Kostova T., and Dirks K. (2001). Toward a theory of psychological own ership in organizations, *Academy of Management Review, 26, 298–310.*

Revans, R. (1998): ABC of Action Learning: *Empowering managers to act and learn from action*. London: Lemos & Crane.

Reynolds, M. (1997) Reflection and critical reflection in management learning. *Man agement Learning, 29, 2, 138-200.*

Ritchie, J. and Lewis, J. (2003): *Qualitative Research Practice: A Guide for Social Sci ence Students and Researchers*, Sage Publications Limited, London.

Rogers, E. (1995) *Diffusion of Innovations 4th.ed,* New York: The Free Press.

Rusbult, C. E., and Van Lange, P. A. M. (1996): *Interdependence processes*. In E. T. Higgins & A. W. Kruglanski (Eds.), Social psychology: Handbook of basic principles, pp. 564-596. New York: Guilford Press.

Saunders M., Lewis P. and Thornhill A. (2003): *Research methods for business stu dents*, 3rd edn. FT Pearson, Harlow.

Say, J.-B. (1803): *Traité d'économie politique, ou simple exposition de la manière dont se forment, se distribuent et se consomment les richesses* (1st edition 803,1, Paris

Sayer, A. (2004): *Foreword: why critical realism?* In Fleetwood, S. and Ackroyd, S. Realism in action in management and organisation studies, Routledge, Lon don.

Schumpeter, J. A. (1934): The *Theory of Economic Development*. Cambridge: Har vard University Press, New York: Oxford University Press, 1961. First published in German in 1912.

Sitkin S.B. and Roth N.L. (1993): Explaining the Limited Effectiveness of Legalistic Remedies for Trust and Distrust, *Organization Science, Vol. 4, No. 3*, Focused Issue: The Legalistic Organization, pp. 367-392.

Star, S. L. (1989): *The structure of ill-structured solutions: boundary objects and het erogenous distributed problem solving*, in: Gasser, L. / Huhns, M. N. (Hrsg.): *Distributed artificial intelligence*, San Francisco: Morgan Kaufmann, S. 37-54.

Sull, D. N. (2004): Disciplined Entrepreneurship, *MIT Sloan Management Review, 46 (1), S. 71-77.*

Tai, G. (2005): *A communication architecture from rapid prototyping*, ACM SIG SOFT Software Engineering Notes, Proceedings of the 2005 workshop on human and social factors of software engineering HSSE '05, 30 (4),S. 1-3.

Teach, R. D, Tarpley, F. A, Schwartz, R. G, (1986): *Software Venture Teams*, in: Ronstadt, R, Hornaday, J. A, Peterson, R, Vesper, K. H. (Hrsg.): *Frontiers of Entrepreneurship Research*, Proceedings of the 1986 Babson College Entrepreneurship Research Conference, Wellesley: Babson College, S. 546-562.

Thomke, S. H. (1998): Managing Experimentation in the Design of New Products, *Management Science*, *44 (6), S. 743-762*.

Thomke, S. H. (2003): *Experimentation matters: Unlocking the Potential of New Technologies for Innovation*, Boston: Harvard Business School Press.

Tilley N. (2000): *Realistic Evaluation: An Overview*, Presented at the Founding Con ference of the Danish Evaluation Society.

Tushman, M. and Nadler, D. (1986): Organisation for Innovation, *California Manage ment Review*, 28:74-92.

Utterback J. (1971): Tie process of technological innovation within the firm. *Academy of Management Journal*, *March 75-88*.

Van Dyne and Pierce JL. (2004): Psychological ownership and feelings of posses sion: three field studies predicting employee attitudes and organizational citizenship behaviour, *Journal of Organizational Behaviour, Volume 25, Issue 4 , Pages 439 – 459.*

Veryzer, R. W. (1998): Discontinuous Innovation and the New Product Development Process, *Journal of Product Innovation Management*, 15, S. 304-321.

Von Hippel, E. (1988): *The sources of innovation*, Oxford University Press, London and New York pp. 232.

Von Hippel, E. (2005): *Democratizing Innovation*, Cambridge: The MIT Press.

Webber S.S. (2002): Leadership and trust facilitating cross-functional team success *The Journal of Management Develop ment; 2002; 21, pg. 201.*

Wheelwright S.C. and Clark K.B. (1992): *Revolutionising Product Development*, New York, The free press.

Yin, R.K. (2003): *Applications of case study research,* 2nd edn. Sage, London.

Zarefsky, D. (2002): *Argumentation: The Study of Effective Reasoning Parts I and II*, The Teaching Company.

10 Appendix

11.1 Discontinuous Innovation Lab

2nd international Conference: Strategic Selection, 26th June in Munich

When?	26th June
Where?	UnternehmerTUM GmbH im GATE Garching / Munich, Lichtenbergstr. 8
Agenda:	***09.30*** *Coffee & Registration* **10.00** **"Selecting Discontinuous Innovations – Tools and Methods"** John Bessant, Imperial College London **10.45** **"Company Interviews: Selection Practise in the UK"** John Bessant, Imperial College London **11.15** *Coffee & Refreshments* **11.30** **"Discontinuous Innovation Lab France – First Insights"** Sylvie Blanco, Grenoble Ecole de Management **12.15** **"Title"** Lars Boettzau, Amcor Flexibles **13.00** *Lunch and Networking* **14.00** **"Lego Serious Play – Results of the Red Cross Workshops"** Poul Kyvsgaard Hansen, Center for Industrial Production, Aalborg University **14.30** **"Idea Selection Based on Prototypes"** Bernhard Doll, UnternehmerTUM GmbH **15.00** **"Selection Practise – Interactive Evaluation of Business Ideas"** Helmut Schönenberger, UnternehmerTUM GmbH **16.15** **"Selecting Discontinuous Innovation – Summary and Outlook"** John Bessant, Imperial College London **17.00** *Close* **Evening Programme** 17.15 bus departure to Hotel Leopold and Hotel Mercure 17.30 bus departure directly to the event 18.00 „Forum Manage&More", Badeanstalt Munich
Contact:	UnternehmerTUM GmbH – Centre for Entrepreneurship at the TU München Daniela Müller, Lichtenbergstr. 8, 85748 Garching, Tel: +49 (0)89 - 32 46 24-165 mueller@unternehmertum.de, www.unternehmertum.de, Fax: +49 (0)89 - 32 46 24-100

11.1 Interview Guide for Team Leader and Team Members

Introduction

- Anonymous and confidential
- Open and reflective interview
- Feel free to ask questions any time

Researching the Context

- How do you perceive the TUM culture?
- How do you perceive the M&M culture?

Researching the Social Interactions of the Teams

- How do you perceive your team culture?
- How would you describe team work in your team?
- How would you describe team leadership in your team?

Researching the deeper Coherences of the Social Interactions

- Please give account of two different feedback situations
- How would you describe the decision making process in your team?
- How would you describe the consensus building process in your team?