Nikos DUTCH INSTITUTE OF KNOWLEDGE INTENSIVE ENTREPRENEURSHIP

Master of Science thesis Industrial Engineering and Management

G. Weijman, Enschede, July 2008

Mentor on the couch

Articles:

Determining the impact of a business development program

Harvesting the results of the mentoring process of knowledge intensive start-tups

University of Twente
Enschede - The Netherlands

Nikos
Dutch institute for Knowledge Intensive Entrepreneurship

Master of science thesis Industrial Engineering and Management

Author:
G. Weijman
s0009865
Technische Bedrijfskunde - cohort 2000
geertjanweijman@gmail.com

Supervisors:

P.C. van der Sijde
Senior project manager at NIKOS, the Dutch institute of Knowledge Intensive Entrepreneurship

J.W.L. van Benthem
Stimulating entrepreneurship, Program leader TOP at NIKOS, the Dutch institute of Knowledge intensive Entrepreneurship

Preface

Preface

This thesis presents the findings of the research I did to finish my study in Industrial Engineering and Management. For this research I contacted people at different universities like Linköping Universitet, Dundalk Institute of Technology, University of Maastricht, University of Edinburgh and The Universitat of Dortmund. I would like to thank the people over there for their cooperation and help. Especially I would like to name Magnus Klofsten of Linköping Universitet who, during my stay in Sweden, brought me into contact with interesting people for my research and allowed me to experience the Swedish hospitality.

But off course I did the main part of my research at the University of Twente. I therefore would like to thank my supervisor Peter van der Sijde whose 'open door policy' was very important for this research. Without his comments and support this research would not have been what it is now. Further I would like to thank Jann van Benthem, my other supervisor for his thoughts, positive mentality and for getting me coffee. Last I would like to thank all other people that in a way had an influence on the outcomes of this research.

Geertjan Weijman

Contents

General contents:

Determining the impact of a business development program

It is important for a country important to have a high level of high potential entrepreneurship, something that is not true for the Netherlands, because it stimulates economic growth. It therefore is important to increase the prevalence of high-potential entrepreneurship. According to Autio (2003) this prevelance can be increased by supporting academic spin-offs. It therefore is quite logical that business development programs have emerged at Dutch universities. This article researches how such a program helps an high potential entrepreneur by looking at the Entrepreneurship in Networksmodel. The different arrangements of the program are linked to the capitals of the EiN model as a result of some interviews with former participants of such a program. The results show that the support mechanism that has the most impact on the capitals is the mentoring. Furthermore, the results indicate that the program understudy may be to general which makes that not every mechanism is useful for companies in different development phases of the EiN model.

page 26

Harvesting the results of the mentoring process of knowledge intensive startups

Mentoring is often used by business development programs to assist startups. In this paper we look at the perceptions of protégés and mentors about this process, hereby different business development programs in Europe were incorporated. It was hypothesized that there is a relationship between contact frequency and amount of support delivered to the protégé. This hypothesis was partly supported. Furthermore we hypothesized that if the amount of support is higher that the positive associated outcomes like trust and benefits to the protégé also will be higher. This hypothesis was mainly supported for the benefits of the protégé. Last also the relation between short and long term outcomes was hypothesized. The research showed that there is a relation between the benefits and the profoundness of the relation in the long term. The corresponding implication for program managers are discussed below.

Furthermore:

Management summary

This master thesis is about the influence of business development programs on the university spin-off process. Business development programs hereby are the programs that universities offer to starting entrepreneurs. The research is divided into two parts.

Impact of business development programs

To start with the first part: According to Autio (2003) this prevelance can be increased by supporting academic spin-offs. It therefore is quite logical that business development programs have emerged at Dutch universities. The first part (chapter 3) article researches how such a program helps an high potential entrepreneur. The different arrangements of the program are linked to the capitals of the EiN model using casestudies of former participants of TOP (Case studies can be found in Appendix 3).

The research showed that mentoring was among the most important mechanisms for the most participants. Mentoring turned out to be of influence on most of the capitals of the entrepreneur and thus seems of even more importance. This doesn't mean that universities only should deliver mentoring to people who want to start a business. Although mentoring is of much importance it is still important that program managers keep in mind that different entrepreneurs, need assistance in the development of different capitals and therefore different business development mechanism should still be made available to people who want to start a business. Hereby, the results indicate that the program understudy may be to general which makes that not every mechanism is useful for companies in different development phases of the EiN model.

Harvesting the results of the mentoring process for knowledge intensive startups

The second part of the research focuses on the mechanism that turned out to be the most important, according to the first part of the research, mentoring. In the chapter the perceptions of protégés and mentors about the mentoring process were subject of study.
Some hypothesis were drawn up based on the literature and researched using a web based questionnaire that was put out to mentors and protégés in the Netherlands, Finland, Sweden, Ireland and the UK. The hypotheses were tested with regression analysis and some mann-whitney tests.
It was hypothesized that there is a relationship between contact frequency/intensity and amount of support delivered to the protégé. The results of the questionnaire indicated that only for the perception of the protégé the frequency and intensity are of importance for the amount of psychosocial support they receive from their mentor. For career-related support only the intensity of the relationship turned out to be of influence. Furthermore we hypothesized that if the amount of support is higher that the positive associated outcomes like trust and benefits to the protégé also will be higher.
In the short term there turned out to be only a relationship between the psychosocial support the protégé gets and the Trust in the partner. The benefits for the protégé in turn had a relationship with both the amount of psychosocial and career-related support. The results of the questionnaire further indicated that trust maybe not that important for a mentoring relationship to continue after a business development program. The benefits one gains from the

relationship seem of more importance. Finally, protégés indicated the same frequency of contact, provision of support, short term outcomes and long term outcomes for both types of mentors. It turned out that for all variables except career-related support according to the perceptions of the protégés the results were the same.

Implications

The research has some interesting implications for practice and further research. It could for instance be interesting to look at the possibilities for online mentoring services. The research after all indicated that trust maybe less important during a mentoring relationship than one should expect. Furthermore, it would be interesting to look at more general online business development services and how these could be incorporated into the TOP program. The research also showed that it could be interesting to other additional business development mechanisms as a part of TOP like access to investors and other courses.

1 Introduction

Introduction

Nowadays a university has three important functions it should perform. These functions even are named in some regulations for universities. The functions (sometimes also called spheres) are Research, Education and Knowledge transfer. Research and Education in these are very straightforward, but Knowledge transfer is not. In short, the intention of Knowledge transfer is to 'share' the available knowledge at a university with its surroundings to help the local economy to benefit from it. A lot has been written about the importance of knowledge transfer (Etkowitz, 2005), its organization (van der Heide, 2008) and its different forms. In this thesis we will focus on one form of knowledge transfer, the commercializing of university knowledge by the use of business development programs. Universities see

the importance of the resulting spin-offs and try to stimulate the arising of spin-offs (Rasmussen, 2006). Of importance hereby are the ways the different mechanisms influence the development of the startups, but also the importance of the different mechanisms. This is what we will look at in this research.

Roughly there are three parts in this thesis. First, there is the development of the conceptual framework that is used to cover the whole research. Secondly, there are the two subjects of the research: (1) the influence of the different parts of a business development program and (2) the results of the part of the business development program that turned out to be the most important. Ultimately mentoring turned out to be this most important part and it therefore was the subject of research.

We will start the research by giving an overview of the research context in Chapter 2. This overview is used to build up a conceptual framework that covers the whole research. Furthermore in this chapter the Research design and research questions are given that will be answered in the chapters afterwards.

Chapter 3 is one of those chapters and looks at the influence of a business development program on the companies of participants. Hereby primarily the results of the case studies done are of importance. Chapter 4 goes more into dept for the business development mechanism that turned out to be the most important amongst the one delivered by the business development program under study, mentoring. The findings in this chapter are all the result of a questionnaire put out to participants of business development programs in Europe. Finally, chapter 5, summarizes the findings of this study, gives some implications for program managers and further research.

2 The research project

Research context

As said before, this study focuses on the commercializing of university knowledge by using business development programs that assist entrepreneurs. To give a good indication of the research context, some relevant literature will be presented in the following paragraphs. The model of the university spin-off process (Rasmussen, 2005), is used to build up the conceptual framework, which is used during this study.

University spin-off process

In the literature no general definition of spin-off companies exists (Rasmussen, 2006). A spin-off in this study is seen as a new venture that is started based on knowledge or technology of a university. Research has shown that the started spin-offs have a higher probability to survive than 'normal' startups (Rasmussen, 2006). Before such a venture is started a whole process has to be passed. Rasmussen (2005) developed a model to describe this process of university spin-off creation. In this model Rasmussen (2005) focuses on opportunities, individuals and the university as context to explain the entrepreneurial process of university spin-off creation. An overview of this model is given in figure 1. In a way, this model is build up on the components of the entrepreneurial process Shane (2003) named, adapted to the entrepreneurial process of spin-off creation.

Shane (2003) identified as components of the process the characteristics of opportunities, the individuals who recognize, prepare and exploit them, the skills and strategies used to organise and exploit opportunities, and the environmental conditions favourable to them.

The opportunity

An opportunity can be defined as a potential resource of generating profit that has not been exploited before and is not exploited by others (Baron, 2006). In the entrepreneurial process of university spin-off creation, a business opportunity is developed based on academic research and knowledge. The first step hereby is the identification and creation of an opportunity. The individual and context hereby play an important role. According to Shane and Venkataraman (2000), not all people are able to see these opportunities. The creation of an opportunity depends on the opportunity material, individual(s), and the current setting of time and place, in this case the university. The next step in the process is the pursuing of the opportunity. In this stage the opportunity is developed into a business model. This development dependens on all individuals associated with the opportunity and the environment in which it takes place. Very important hereby are the entrepreneur himself and the way the university support this development (Rasmussen, 2004). According to Rasmussen (2004), after developing the opportunity into a business concept

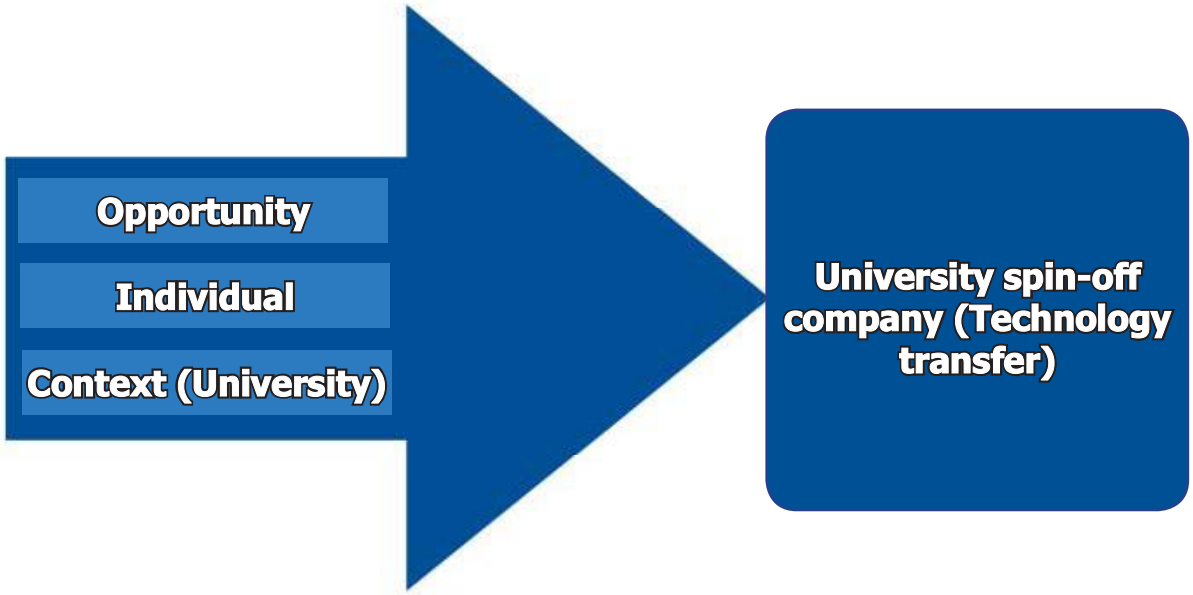


Figure 1: The entrepreneurial process of university spin-off creation (Rasmussen, 2005)

(and provision of necessary resources) "the process of developing the new venture" begins. This is a difficult process although all resources are provided, because the process is still sensitive to outside influences related to the opportunity, the involved individuals and the organizational context (Rasmussen, 2004).

The stages an opportunity goes through according to Rasmussen (2005) are quite similar to the stages described in the Entrepreneurship in Networks (EiN) model (Groen, 2005). Only in the EiN model they are labeled opportunity recognition, opportunity preparation and opportunity exploitation. This model, which describes the development of an opportunity and the related factors therefore could be of importance to this research. The central hypothesis in this model is that entrepreneurs working in network-embedded enterprises require sufficient capital relevant to each of the four domains in order to be able to create sustainable enterprises and progress through the different stages. (Nikos progressreport, 2005):

- Cultural Capital: These are the values, knowledge, skills, experience, technology and the way everything is organized in the enterprise.
- Economic Capital: Money and other financial resources of the enterprise.
- Social (Network) Capital: The contacts the enterprise has with its environment.
- Strategic capital: The strategic intent of the enterprise, and the way it attains and uses power, authority and influence.

In figure 4 a complete overview is given of the EiN model, the relation between the different capitals and the different phases the opportunity goes through.

The individual

In the literature the relation between the opportunity and the individual is often named. Baron (2006) for instance defined opportunity recognition "as the cognitive process (or processes) through which individuals conclude that they have identified an opportunity". According to Rasmussen (2006), it is even dubious to study spin-off formation without including the individual. This may explain why the individual is one of the most topics of research in entrepreneurship research (Ireland et al, 2005).

In the EiN model also the relation between the individual and the opportunity during the entrepreneurial process is seen just as in the model of Rasmussen (2005). Groen (2005) for instance sees the individual or entrepreneur as the person that leads the opportunity through the entrepreneurial process and needs sufficient capital to do so. Sarason et al (2006) note that entrepreneurial action occurs at the point where the individual and the opportunity overlap, the so-called nexus of individual and opportunity. Without an individual who sees the opportunity, the entrepreneurial profit of the opportunity will not be earned (Shane et al, 2000).Furthermore not all individuals see the same opportunities. Different entrepreneurs will act differently during the entrepreneurial process (Rasmussen, 2006).

In the literature different reasons for this are given like the possession of prior information and cognitive properties to see its value (Shane et al, 2000), active search for opportunities, perceptions of risk, prior knowledge and alertness (Baron, 2006) and off course the favourable environmental conditions named by Shane (2003). Rasmussen (2006) even identified special characteristics of the individual that play a role in spin-off formation like motivational pull factors, motivational push factors, star scientists, lack of business experience, networking activity, research group characteristics and entrepreneurial team characteristics. The individual and the opportunity are not the only factors in the process. The discovery of an opportunity is done by one individual, but in the next phases of preparation and exploitation more individuals can be incorporated (Shane, 2003). In this, the context also plays a major role by delivering resources like the individuals helping the individual who discovered the opportunity. It therefore is no surprise that factors related to the context like environmental factors, external pressure and social context also are of importance (Rasmussen, 2006).

Context (University arrangements)

The factors named above are all related to the context in which the individual discovers, prepares and exploits the opportunity. The university context helps, but also hinders the academic entrepreneur in this process (Rasmussen, 2006). Because of the link between entrepreneurship and economic growth (van Praag, 1999) the favourable conditions a university can arrange during the spin-off process have received a lot of attention. The role of the university context

in the spin-off process has been researched by looking at characteristics of the university setting like: the university as resource provider, university culture, university policies, network and support programs and boundary organizations (Rasmussen, 2006).

In the model of Rasmussen (2005) these characteristics of the university are the context in this research. In this research we focus on the support programs and arrangements a university has that can help individuals to develop opportunities into viable entreprises. These support programs differ a lot across universities (van der Sijde et al, 2004) and as a result it may be no surprise that the infrastructure tuned to supporting entrepreneurs is extensive (Klofsten et al, 1998).

It therefore is difficult to give a standardized model of a business development program. This is even more true because most cases in the literature on university initiatives are about single cases (Rasmussen, 2006). Below, this difference is made clear by giving some examples are given of the different support mechanisms of different programs in Europe.

- Novation Enterprise Platform Program (NEPP, Ireland):

Delivers its participants business mentoring and advice, project management, training, networking, access to facilities and financial assistance

- Entrepreneurship and New Business Development Program (ENP, Sweden):

Delivers its participants business mentoring, supervision, training, networking, access to a business incubator and financial aid via its network

- Temporary Entrepreneurship Place (TOP, The Netherlands):

Delivers its participants business and scientific mentoring, supervision by a committee, training, networking, access to facilities and financial aid in the form of a personal loan.

One way to generalize these functions provided would be to use the division made in the article of Klofsten et al (2000) about innovation support services. They identified four bundles, namely Technology related services, Market-related services, Finance related services and Soft services. Of the programs named above only the TOP programs has services in all these dimensions. NEPP and ENP both seem to miss a technology related support, which in the case of TOP is given by scientific mentoring. This makes TOP an interesting case when looking at university arrangements, but there are more reasons. The TOP program already exists since 1984 and throughout the past it has delivered multiple successfull spin-offs. Furthermore the program is strongly linked to the EiN model that in this research is used to look at the opportunity and its relation with the individual. Therefore, for the university arrangements we will use the TOP program

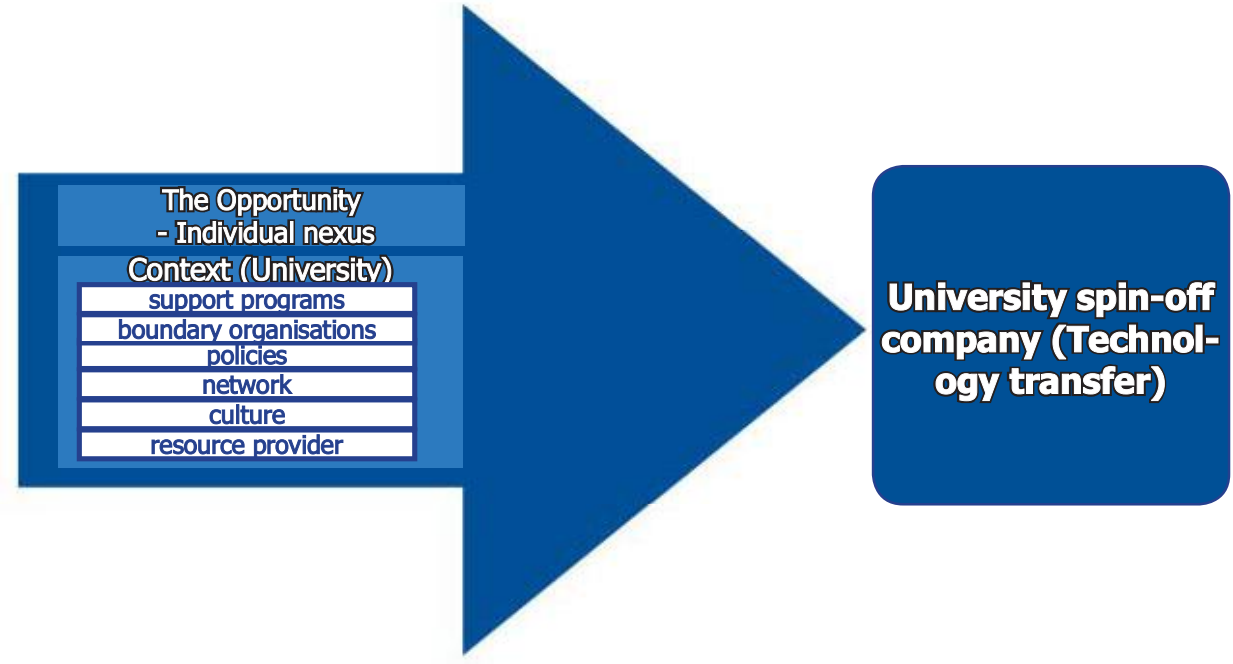


Figure 2: The conceptual framework

as a basis.

Conceptual framework

The opportunity, individual and university context form the basis of the conceptual framework that is the starting point of this study. This framework is presented in figure 2. Following Shane et al (2000), we will see the development of the opportunity and the individual as dependent of each other. This dependence in this research is presented by the EiN model in which the individual is the person who 'pushes' the opportunity through the entrepreneurial process. In the framework for us the relation between the university arrangements and the development of the opportunity and entrepreneur is importance. We are primarily interested in the relationship between this 'opportunity - individual nexus' and the arrangements at an university. For the 'opportunity - individual nexus' in this case we will use the EiN model and the university support arrangements are represented by the TOP program of the University of Twente. The advantage here of the EiN model here is that it not only incorporates the nexus between the development of the opportunity and the individual but also incorporates other forces in the form of other capitals, in this model economic capital, strategic capital, network capital and cultural capital. The levels of these capitals are linked to the entrepreneur, his characterists, actions and more. The capitals for instance are also influenced by the support arrangements an individual can make use of at the university. In hereby could be that one arrangement has more influence than another. The research questions related to the research are given in the next paragraph.

Research questions

Now that we have given the research context, it is time to introduce the exact field of study of this research. As said before first, there will be looked at the relationship between 'the opportunity-individual nexus' and the support arrangements. When looking at the conceptual framework this means that the influence of the arrangements by the university are researched in relation to development of the opportunity, the connected individual and the creation of a spin-off company. Above it has been made clear that the EiN model is a good model to research this development, so that model will act as a starting point to look at the TOP program, the program selected above. This relationship is researched in Chapter 3.

Determining the impact of a business development program

The conceptual framework contains business development mechanisms that are part of a business development program, which aims at helping the entrepreneur to develop his idea into an reliable enterprise. Interesting hereby is which of the mechanisms that are provided are really used. Therefore the first research question is:

1. What do participants in a business development program use of the support mechanisms that are offered?

Secondly, it is of importance to know what the influence is of the different business support mechanisms and therefore the second question is:

2. How do the university arrangements influence the development of the opportunity connected to the individual?

As said before this last question will be researched by looking at the EiN model.

Harvesting the results of the mentoring process of knowledge intensive startups

In the second part of this master thesis we go more in depth for one business development mechanism. To do so, we held some exploratory interviews and read some literature to determine which mechanism would be most interesting to research. Out of this short study was learned that mentoring was one of the most important business support mechanisms and therefore this mechanism is the subject of chapter 4. Here, we are interested in the results of the mentoring in the short term and the long term and therefore the research questions are:

1. What results can be harvested as a result of the mentoring process directly after the business development program?

2. What results can be harvested as a result of the mentoring process on the long term?

The difference in these two questions lies in the fact that directly after the program people will have some form of contact with their mentor, because he or she is formally assigned as a result of this program. In the long term people can decide for themselves whether they continue the relationship, in this case in a more informal setting. Researching this could tell us more about the outcomes of a mentoring relationship that can help to develop the relationship to

a higher level.

Research Design

Based on the empirical cycle (De Groot, 1981) we made an overview of the research process, which is given in figure 3. The research hereby is divided into 5 parts. First, the literature about business development mechanisms and their impact on the university spin-of process are researched to get a good understanding of the field. Based on these findings some interviews are done to get an insight in different business development programs provided by universities in Europe and some more knowledge about certain mechanisms. Then, one program is researched by doing some case studies of former participant of a business development program. The focus hereby is on the impact of the program, the results of these study are given in chapter 3. In the fourth step, a web based survey is developed and put out to research one business support mechanism , mentoring. In chapter 4 the results of this survey are presented along with the implications.

Data resources

For the research a lot of different data resources are used.

Literature

Relevant literature was searched on university spin-offs, the entrepreneurship in networks model and business development mechanisms. Hereby mentoring has got a lot of attention. Furthermore we tried to use more then one database to search literature. Databases which were used are for instance: Google scholar, Picarta and the library catalogue. This is done because it could be that one database doesn't incorporate all relevant journals out, for instance, the top 25 of the ISI list. If not this whole list is covered it could be that important literature is missing.

Exploratory Interviews

The exploratory interviews consisted of interviews with program leaders of different business development programs, former participants and people who had been part of a business development program. Furthermore, at the beginning of the research some interviews were done with different entrepreneurs to get more insight what they need and how they work.

Case studies

Case studies are used to get a better

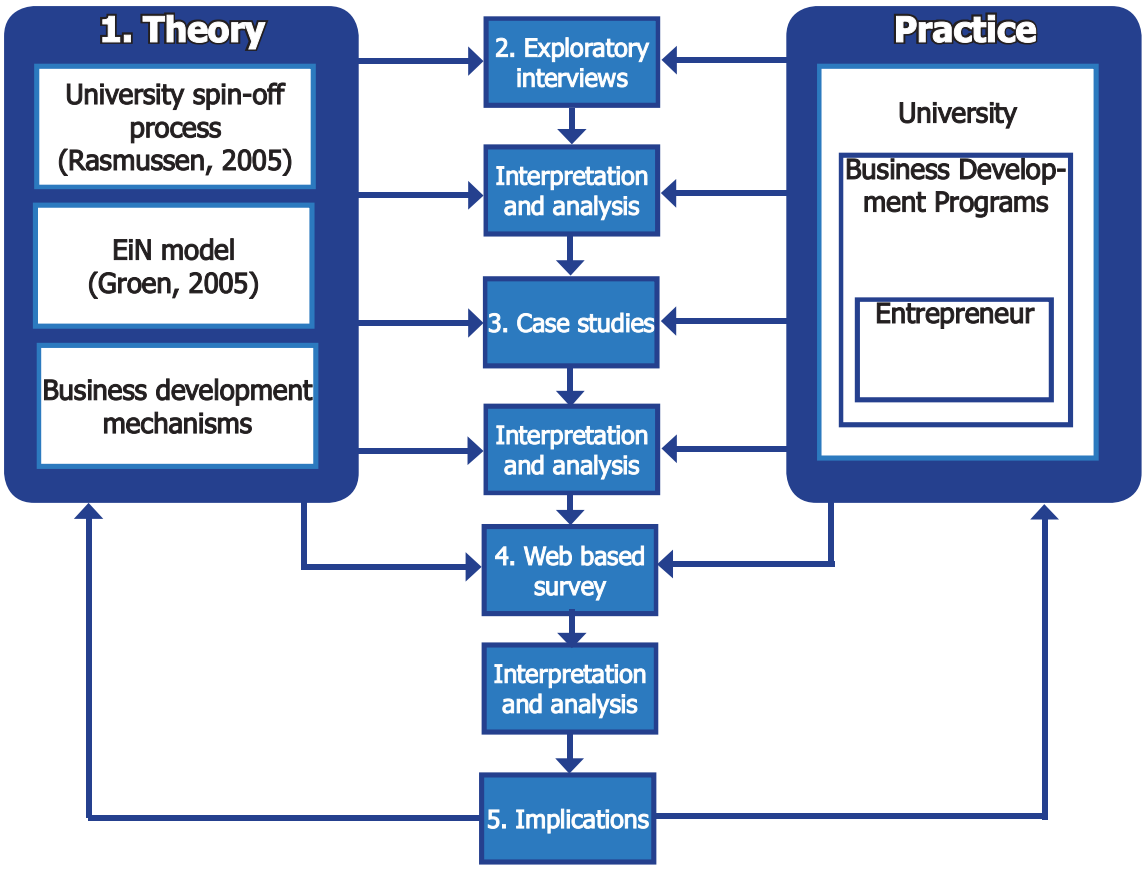


Figure 3: The research design

insight into the impact of a business development program on the development of the entrepreneur. The central theme in these case studies is how the program influenced the development of the different entrepreneurs. According to Yin (2003) case studies are preferred above other research methods when 'how' or why questions are asked, which makes case studies a good method.

Six former participants of the business development program were interviewed based on the interview protocol given in the appendix 1.

Web based survey

A web based survey was used because such a survey brought some advantages with it. Surveying by the Web disposes the need to print and distribute surveys, is cheaper and prevents data entry errors (Schmidt, 1997).The web based survey was developed to get more quantitative data about the results of one of the business development mechanisms, mentoring.

The questionnaire was put out to participants of different business development programs in Europe and their mentor.The questionnaire can be found in appendix 2.

Relevant documents

To learn more about the arrangements at the different universities some documents have been studied. These documents gave an insight in the organization and setting of the different universities.

Besides this also some documents were studied to get more insight in the operations of the companies that were part of the case studies.

3 Determining the impact of a business development program

Abstract

It is important for a country important to have a high level of high potential entrepreneurship because it stimulates economic growth. It therefore is important to increase the prevalence of high-potential entrepreneurship. According to Autio (2003) this prevelance can be increased by supporting academic spin-offs. It therefore is quite logical that business development programs have emerged at Dutch universities. This article researches how such a program helps an high potential entrepreneur by looking at the Entrepreneurship in Networksmodel. The different arrangements of the program are linked to the capitals of the EiN model as a result of some interviews with former participants of such a program. The results show that the support mechanism that has the most impact on the capitals is the mentoring. Furthermore, the results indicate that the program understudy may be to general which makes that not every mechanism is useful for companies in different development phases of the EiN model.

Introduction

Entrepreneurship and economic growth often are linked in the literature (Van Praag, 1999); (GEM Monitor, 2006). Nevertheless recent research by Wong et al (2005) has shown that a higher degree of entrepreneurship does not mean strengthening of the economic development. According to their research, the only form of entrepreneurship that is positively associated with economic growth is high potential entrepreneurship (Wong et all, 2005). This is quite logical when knowing that high potential entrepreneurship often is associated with technological innovation (Autio, 2003) that is considered as a major force of economic growth (Rosenberg, 2004). Thus rapidly company growth and high potential ventures contribute to economic growth and prosperity (Autio, 2003).

As a result, it is important for a country to have a high level of high potential entrepreneurship, something that is not true for the Netherlands. The GEM monitor of 2002 (Autio, 2003) shows us that the prevalence of high potential entrepreneurship is average and even low compared to countries like New Zealand. It therefore is important to increase the prevalence of high-potential entrepreneurship. This can be achieved by increasing the amount of individuals who start such high potential ventures. According to Autio (2003) this can be done by supporting academic spin-offs. It therefore is quite logical that business development programs have emerged at Dutch universities that are aiming at helping individuals in different phases of the starting of a high potential venture. Examples are for instance Team Venlo at the University of Maastricht and the Temporary Entrepreneurship Position (TOP) at the University of Twente. Interesting in these is how such a program helps an high potential entrepreneur. Therefore our first research question is:

1. What do different participants of a business development program use of the support mechanisms that are delivered by the program?

In this article we will try to answer this question by looking at the program of the University of Twente, the TOP program. TOP consists of different support mechanism that can be used based on the needs of the enterprise. These needs off course are dependent of the level of development of an enterprise before entering in a business development program. To be able to describe the different levels of development it would be good to use a framework that describes this development. Van der Sijde and Groen (2004) before with success used the Entrepreneurship in Networks (EiN) model to describe the development of high potential entrepreneurs. This model describes different phases of development an enterprise can be in with associated level of capitals. In this paper we are not only interested in the mechanisms that are used but also when. Therefore we will use the EiN model to find the answer to the following question:

2. How do the mechanisms influence the outcome of the entrepreneurial process and in these which capital is most important?

Overview of the research context

In this section an overview is given of the TOP program and the EiN model. In this way the precise research context is given.

TOP

TOP exists since 1984 and is a program that has had some success and even is transferred to other countries. It helps entrepreneurs by delivering starting entrepreneurs tailor made support depending on the phase of development the entrepreneur is in and the associated needs.

The objective of TOP is to transfer knowledge and technology between the University and the local community. By assisting starting entrepreneurs by developing their idea (based on knowledge of the university) into an enterprise the knowledge of the university is brought into practice in the local community. TOP uses different mechanisms to assist the entrepreneurs. The TOP-program is not only open for UT-graduates and UT-researchers, but also for graduates from other universities and entrepreneurial people from industry, who want to develop a product in co operation with the UT. The only restrictions are that the TOP-year has to be spend at the University of Twente, one has to apply oneself full-time for the start of the enterprise and that there is a link with a department of the university. The results of TOP are excellent with 75% of the companies surviving.

As said before, the objective of TOP is to assist starting entrepreneurs and in this way transfer knowledge of the university to the community. An entrepreneur has to meet certain criteria before a TOP place is granted. These differ from the writing of a business plan to finding a link to knowledge of the university. After entering the TOP program the following support is provided to the entrepreneur based on the different phase of development:

- Facilities: office space, secretarial support, laboratory facilities
- Mentoring: the scientific mentor and the business mentor
- Access to the network of the university: use of the relation network and image the possibility to generate assignments via the university and membership of Technology Circle Twente (TCT)
- Personal loan
- Access to training: courses becoming an entrepreneur and writing an business plan
- Monitoring by the TOP commission

The named support mechanisms are interrelated. A scientific mentor, for instance, also shares the knowledge of his faculty or his personal network with the participant. Now that the content of TOP is given we will shortly describe the EiN model which will help us to describe the different phases of development an entrepreneur can be in and explain the impact of the different support arrangements on the companies of the

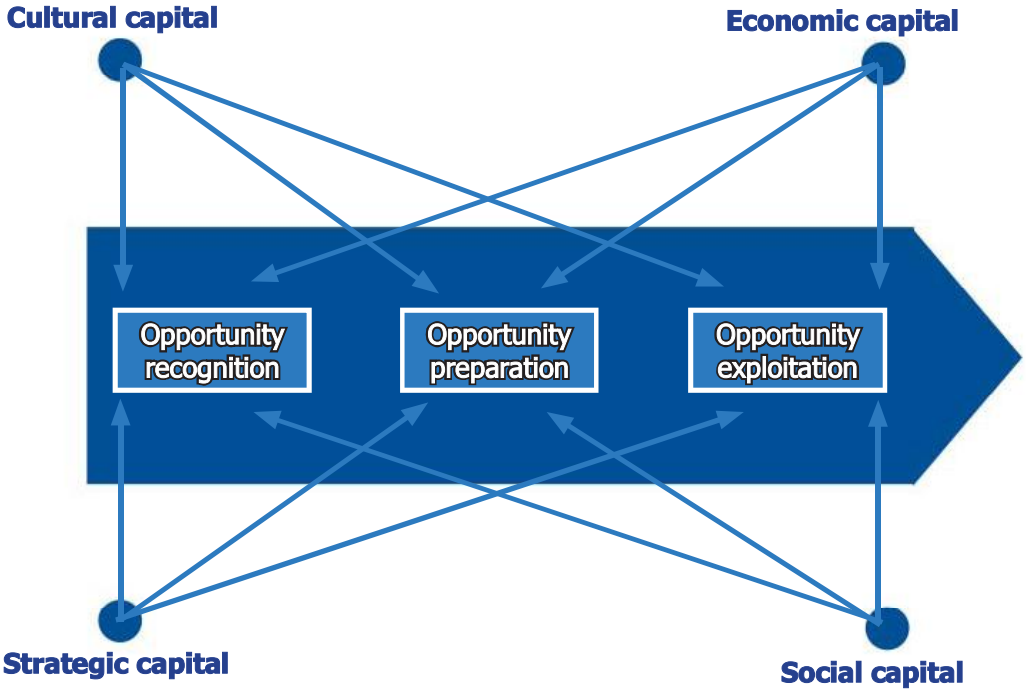


Figure 4: The EiN model

participants.

The Entrepreneurship in Networks model

As said before, the EiN model describes the phases an entrepreneur passes through by seeing entrepreneurship as a process. This process is directed by the entrepreneur (individual or organization) (Habets, 2007). During the process value is created by stepping through different phases labeled opportunity recognition, opportunity preparation and opportunity exploitation (Van der Veen et al, 2004)

Opportunity recognition: the entrepreneur discovers and develops an opportunity/idea into a business opportunity (Kirwan et al, 2006).

Opportunity preparation: the business opportunity is developed into a business concept.

Opportunity exploitation: the business concept is absorbed by the market.

Of course this process is not a linear process (Kirwan et al, 2006). Some decisions will have to be changed as a result of changing circumstances (Kirwan et al, 2006) or insights. The process hereby is a subsystem of a broader societal system (Ripsas, 1998) and therefore based on Parssons system theory could be described in terms of the four system problems: goal attainment, adaption, integration, and latent pattern maintenance (Ripsas, 1998). Groen (2005) combined these ideas about entrepreneurship as value creation and system theory into a multidimensional framework, the Entrepreneurship in Networks model (EiN).

The central hypothesis in this model is that entrepreneurs working in network-embedded enterprises require sufficient capital relevant to each of the four domains in order to be able to create sustainable enterprises. (NIKOS progressreport, 2005):

- Cultural Capital: These are the values, knowledge, skills, experience, technology and the way everything is organized in the enterprise.
- Economic Capital: Money and other financial resources of the enterprise.
- Social (Network) Capital: The contacts the enterprise has with its environment.
- Strategic capital: The strategic intent of the enterprise, and the way it attains and uses power, authority and influence.

Contextualization

Now that the model and the TOP program have been described we will use the model to contextualize the TOP program. Ideally TOP will help starting entrepreneurs to develop enough capital in all the different domains and associated phases. Because all the phases are not that fixed it could be that one support mechanism can be applicable in several phases. We will show this by naming for every stage the way the capitals should be supported in that phase and the associated parts of TOP that can help with this.

Opportunity recognition

As noted before, this is the phase in which the entrepreneur discovers and develops an opportunity/idea into a business opportunity (Kirwan et al, 2006). According to van der Sijde and Groen (2004) the support on the economic capital in this phase should incorporate little financial support (Van der Sijde and Groen, 2004). This is provided by TOP in the form of a personal loan. The strategic capital should be supported in a passive way (Van der Sijde and Groen, 2004) in this phase to help the entrepreneur to see an opportunity. This kind of support is also less important because before entering into TOP the entrepreneur almost always has a business idea, he has to write a business plan around it before entering TOP. The only support that is given on the strategic capital in this phase is the monitoring by the TOP commission based on the business plan. By criticizing the plan they help the entrepreneur to think better about the business opportunity and improve it. The cultural capital in this phase mainly is about the knowledge of the entrepreneur (Van der Sijde and Groen, 2004). The help of a scientific mentor in these will help the entrepreneur because he will give the entrepreneur access to the knowledge of the university. Last the social (or network) capital in this phase mainly can be supported by giving the entrepreneur reactive access to networks (Van der Sijde and Groen, 2004). In TOP this is supported by giving the participant access to the network of the university but also by the mentoring. By assigning a mentor to the entrepreneur, the entrepreneur increases his network. But for both is true that if the entrepreneur doesn't use them, he will not benefit from them.

Opportunity preparation

In this phase, the business opportunity is developed into a business concept. For the economic capital in this phase mainly support in the form of the provision of incubation space at a knowledge department is of importance (Van der Sijde and Groen, 2004). Facilities is the part of TOP that delivers this kind of support to the entrepreneur, but often this is very much related to the scientific mentor because the entrepreneur most of the time gets office space at the department of his scientific mentor. The strategical capital in this phase is not influenced much in this phase (Van der Sijde and Groen, 2004). The strategic choices mainly

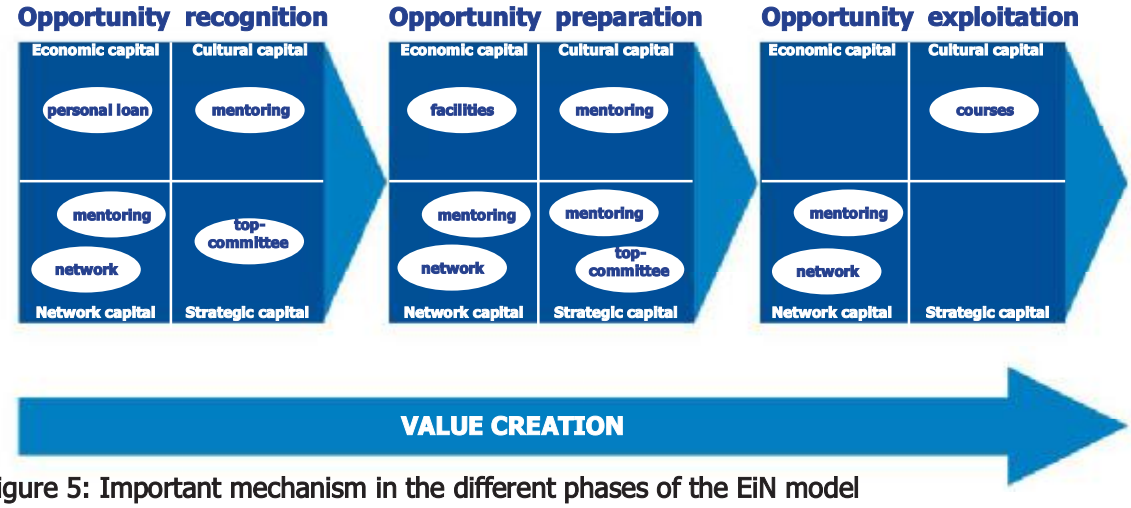


Figure 5: Important mechanism in the different phases of the EiN model

are made by the entrepreneur himself. The only thing a business development program, like TOP can deliver in this phase is a kind of mirror in which the entrepreneur can see what the consequences of his choices are. This kind of support can be delivered by the scientific mentor and business mentor of TOP, but also by the monitoring of the TOP commission. They can give the entrepreneur insight in the consequences of his choices by using their own knowledge and sharing it with the entrepreneur. The cultural capital in this phase in influenced through the limited contribution of knowledge from the University (Van der Sijde and Groen, 2004). In TOP this happens through the scientific mentor who shares his knowledge in the field of interest for the entrepreneur. Finally, the social capital in this phase can be increased in the same way as for the previous phase according to van der Sijde and Groen (2004). So the mechanisms of TOP that can help with this are the mentoring (scientific and business) and the access to the network of the university.

Opportunity exploitation

In this phase the business concept is absorbed by the market (Kirwan et al, 2006). Economic capital shouldn't be supported in this phase (Van der Sijde and Groen, 2004), so we don't think that TOP helps the entrepreneur with this in this phase. The strategic capital isn't supported in this phase either because they don't have any control of the startup (Van der Sijde and Groen, 2004), so probably TOP will not support this capital in this phase. The cultural capital seems one capital that can be supported in this phase. According to van der Sijde and Groen (2004) it is possible to support this capital in the exploitation phase by giving them access to courses and training in the field of entrepreneurship. The management is often not that experienced in doing business and these courses can help them. TOP also gives this kind of support with the courses on "Becoming an entrepreneur". For the last capital, the social capital again the same as before is true. Mentoring and access to the network of the university will help them with it.

Concluding

In figure 5 a summary is given of the important mechanisms in the different phases. In conclusion, one can say that out of the picture it becomes clear that the mentoring part of TOP probably will have the most impact on the different capitals of the EiN model. According to the literature it could be of importance in all the phases of the entrepreneurial process. The network of the University also seems important in every phase of the process. What also becomes clear is

that TOP particularly seems of importance in the opportunity preparation phase. The phase in which an entrepreneur enters the program thus maybe of importance for the use of the different mechanisms.

Method

A number of former participants of the TOP program were selected based on information provided by the program manager and the company's website (if applicable). Hereby a couple of things were of importance. First there was the year they made use of TOP, to ensure that the results were not dependent on the experiences of one TOP year, TOP companies from different years were selected. Furthermore, it was taken in account that some companies were started as result of a direct link with the university in the form of a PhD, study or working at the University while others were people from outside the university with an idea. The selected companies all worked in fields differing from high tech to more 'soft' industries like market research. Ultimately 14 companies from the years 2001-2007 were contacted by phone, or if not possible by e-mail. From this 14 companies, 6 agreed to have an interview. These former participants were interviewed. In table 1 some information about this companies is given like the year they participated in TOP and their link with the university. Company C and Company B bot took part in Kansrijk Eigen Baas (KEB), another program at the university that helps unemployed who want to start a business. Company E and Company F System finished a PhD before entering TOP. Company D already acquired some contact with a faculty before entering into TOP. Company A was started at a faculty of the university before TOP. The complete case study can be found in the appendix.

Company	TOP year	Link with university
Company C	2007	Participant KEB
Company B	2007	Participant KEB
Company E	2005	PhD
Company D	2005	Contact with a faculty
Company F	2006	PhD
Company A	2002	Started at faculty

Table 1: companies under study

Procedure

The cases consist of semi-structured interviews with the founders (and thus participants of TOP) of the company. Besides this, the program leader of TOP was contacted for more information about the program. The interview protocol existed of an explanation of the EiN model, general questions about the company, questions about the effects of the different parts of TOP on the capitals named in the EiN model and a marking of parts of TOP. Each interview lasted about one hour. If needed, some additional information about the company was searched. In figure 7 an overview of the companies is given. As can be found in the table the development of the capitals before entering TOP differs per company. This is quite logical because some enterprises were already started before entering the TOP program.

Results

The companies understudy and their phases

As said before, ultimately six companies

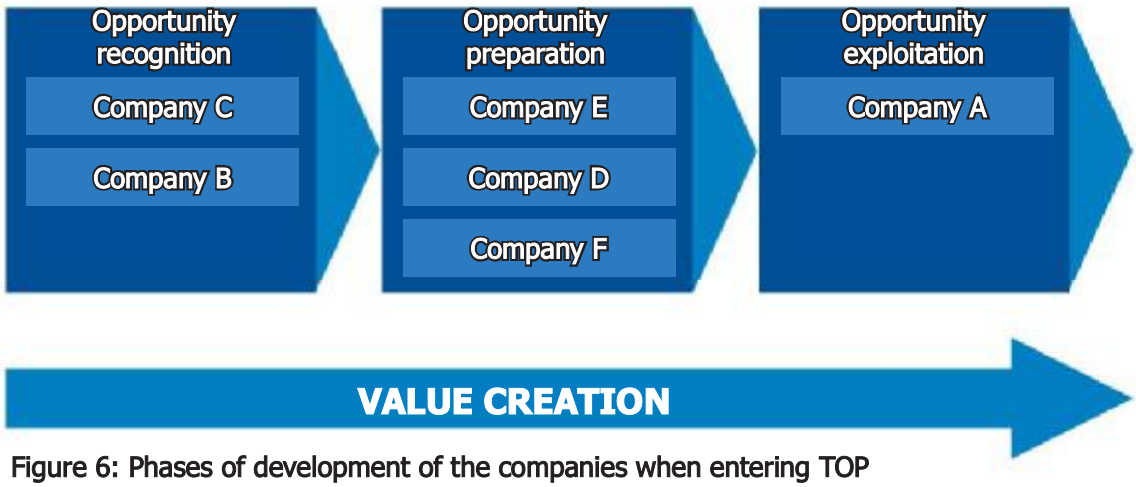


Figure 6: Phases of development of the companies when entering TOP

Capital	Status of the capitals at start TOP	Used mechanisms to improve status
Company C		
Cultural capital	Some experience as a result of former employment	mentoring and courses
Strategic capital	Has an idea and a vague vision	mentoring and topcommittee
Network capital	Contacts in the wrong field	mentoring, network and topcommittee
Economic capital	Social security	loan
Company B Innovation		
Cultural capital	Just technical knowledge	mentoring, facilities and courses
Strategic capital	Has only an idea for a product	topcommittee and mentoring
Network capital	Contacts in the wrong field	mentoring, network and facilities
Economic capital	Social security	facilities, loan and mentoring
Company D		
Cultural capital	Some knowledge available, especially in doing business	mentoring
Strategic capital	Clear Vision on where to go with the enterprise	no effect according to participant
Network capital	Contacts as a result of former employment	mentoring, network and topcommittee
Economic capital	Some savings	mentoring
Company F		
Cultural capital	Knowledge as a result of a PhD	mentoring, facilities
Strategic capital	An idea about where to go with the enterprise	topcommittee
Network capital	Already found an mentor and other contacts	mentoring, network and facilities
Economic capital	Some savings	facilities
Company E		
Cultural capital	Knowledge as a result of a PhD	mentoring
Strategic capital	An idea on where to go with the enterprise	no effect according to participant
Network capital	Contacts as a result of PhD	mentoring and network
Economic capital	Some savings	loan
Company A		
Cultural capital	Well developed as a result of a link to a faculty	mentoring and courses
Strategic capital	Company already existed with corresponding vision	topcommittee and mentoring
Network capital	Contacts as a result of former link to a faculty	mentoring and network
Economic capital	Loan needed for buyout	loan

Figure 7: Influence of TOP on the capitals

responded. The first company, hereafter labeled as Company D is an high tech company that delivers a software application in the energy field. Before he applied for the TOP place, he already had explored the possibilities in cooperation with people of a department of the university. A company was founded and a TOP place granted a year later. For more information about the company we refer to the appendix. Clearly Company D entered the TOP program when they were somewhere at the end of the opportunity preparation phase. They already had explored the idea they had with help of the university and in this way were preparing there opportunity for the exploitation phase. The second company was Company E, they were also already founded before they were granted a TOP place. Their products were based on the knowledge the founders developed during their PhD. Company E already was in the opportunity preparation phase when entering TOP. They already were exploring the opportunities they recognized and tried to develop products that could be sold. The next company, Company A was a special case. It was started in cooperation with a department of the university and already in the opportunity exploitation when the founder decided to 'buy' it from the department. They already had a product they sold to customers. But for the buy out he needed some money. This was the reason that he entered TOP being in the opportunity exploitation phase. Company F was in the opportunity preparation phase when entering TOP. The founders at the time of the founding (2005) decided that they wanted to commercialise their PhD research and started a company based on this idea. After starting the company he and the other founders immediately entered into TOP because that seemed to them a nice practical arrangement to start with. They didn't have a ready product yet but started to develop it in cooperation with an external mentor they found. An overview of the phase of the companies can be found in figure 6.

Used support of TOP

Now that we have determined the phase the companies were in when they entered the TOP program we will look at the Top mechanisms they really used to see whether this is in line with the division out of the literature of the different mechanisms. When looking in figure 7 the use of the different functions of TOP becomes clear. The companies that were in the opportunity recognition phase when entering TOP used almost all functions. Company B made use of all arrangements and Company C only did not use the facilities. This is different for the companies that were already in the opportunity preparation phase when entering into TOP. They made use of less parts of TOP. Company D and Company F for instance didn't use the personal loan, Company D and Company E did not make use of the facilities and none of them made use of the courses. For the company in the Opportunity exploitation phase it again is a little bit different. They also didn't make use of the facilities because they already acquired an office themselves.

Influence on the capitals according to the former participants

The two companies in the opportunity recognition phase indicate a similar pattern when they are asked to give the impact of the different parts of TOP on the capitals

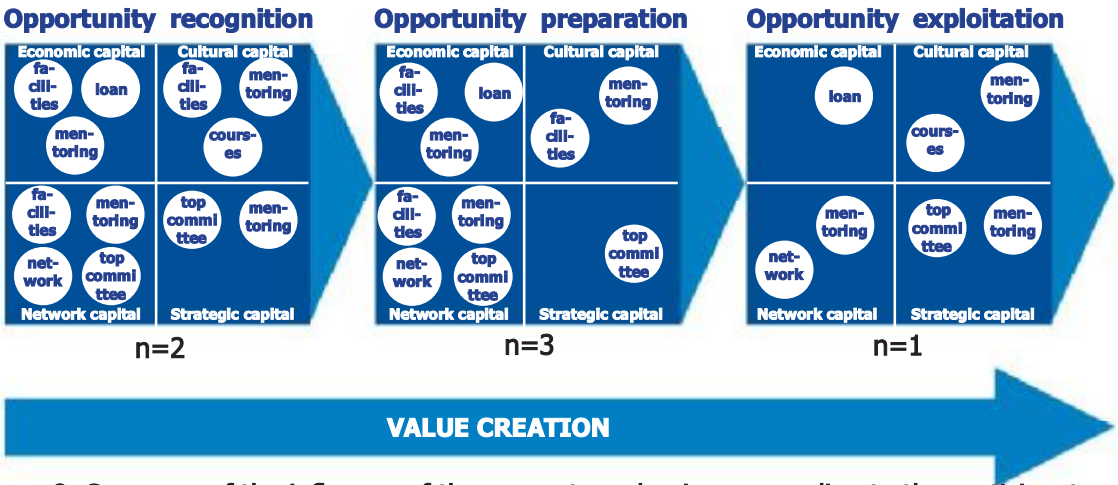


Figure 8: Summary of the influence of the support mechanisms according to the participants

of their company. For both the mentoring and access to the network of the university has an impact on their cultural capital. Their mentors share their knowledge with them and access to the network of the university also gives them access to knowledge and will thus increase their cultural capital. Mentoring and access to the network also are the main drivers to increase their network capital. A mentor has contacts they can use. Access to the network of the university off course also has some influence on their capital.
For Company B also the facilities are of some importance for the development of his cultural and network capital because it gave him access to the knowledge of the people at the offices surrounding them and in this way also helped him to increase his network.
For Company C the monitoring by the TOP commission also had some influence on his network capital because they suggested him some new contacts.
The strategic capital for both is influenced by the mentoring and the monitoring of the TOP commission. Mentors and the TOP commission share their vision on the company with the participants and in this way help the participants to develop a better strategy for their company.
Finally, the economic capital for both companies was increased as a result of the personal loan, which gave them access to some money. For Company B the mentoring also increased his economic capital because he was hired as an employee. Last because he got access to an office, he didn't have to invest in office space and in this way also increased his economic capital.

For all the three companies in the opportunity preparation phase, the mentoring had influence on their cultural capital. Their mentors shared his/her knowledge with them and helped them in this way to increase their cultural capital. For Company F also the facilities were of importance for their cultural capital because it helped them to get access to knowledge.
For the strategic capital most companies in the opportunity preparation phase didn't have any support of TOP according to themselves. Only Company F indicated to have increased his strategic capital as a result of the monitoring by the Top commission. For the network capital all the three companies indicate that in these the mentoring and access to the network of the university were of importance. Besides this Company D indicated that the monitoring by the TOP commission was also of some importance for his network capital. Company F added the facilities as important for the development of their network capital. Finally, the economic capital was influenced in different ways for every company. Company D indicated that there was no influence on their economic capital. They already possessed some capital and didn't need the facilities. For Company F the economic capital was partly influenced by the facilities they used as a result of TOP. This meant some cost cutting and thus an increase in the economic capital. For Company E the economic capital only was influenced by the personal loan.

Company A, as said before, was in the opportunity exploitation phase when entering into TOP. They indicated that for their cultural capital mainly the mentoring and access to courses was of importance. For their strategic capital the mentoring and monitoring by the TOP commission was of importance. Mentoring and access to the network of the university influenced their network capital and the economic capital was mainly influenced by the personal loan they got as a result of TOP.

Phases after TOP

Company B innovation

The idea of Company B innovation was not developed into a working product or business concept during TOP. He is still busy to explore the idea and determine whether his idea is feasible and therefore is still in the opportunity recognition phase. He thinks he has an opportunity but the opportunity not yet is an actual opportunity.

Company C

After TOP Company C is in the opportunity preparation phase. The founder has assessed the idea as being possible and is now busy to develop his idea into an business concept with associated products. He already had some meetings with potential customers.

Company D

Company D at the end of TOP was at the end of the opportunity preparation phase and the beginning of the opportunity exploitation phase.

Company F

Company F still was in the opportunity recognition phase after TOP, they were still in the product development phase and thus busy to transform the idea into a business concept. In 2008 they are planning to come with a product they can sell.

Company E

At the end of TOP Company E was at the end of the opportunity preparation phase and at the beginning of the opportunity exploitation phase. They had (almost) developed some products, were busy to get key customer acceptance and transformed their idea into an business concept from which they could develop further

Company A

Company A in a way during TOP went back to the opportunity preparation phase. With the separation from the faculty, the level of some capitals decreased and had to be increased again. Economic capital for instance was an issue but also the relation with customers. After TOP they were in the opportunity exploitation phase again. The capitals that were less developed as a result of the buy out were back on a sufficient level.

Discussion & Limitations

This study was one of the first that used the entrepreneurial process to determine the impact of a business development program. It should therefore be noted that this study was a preliminary investigation with a relative small sample size of participants of a specific business development program. As will be outlined below the study shows us that a business development program will have a different impact on different participants.

Use of different TOP parts

The intention of TOP is that every kind of support needed is available. Participants should make use of them based on their own needs. It is a kind of box of bricks out of which all kind of bricks can be picked to build your own company. The initiative hereby lies with the participant. This is exactly what can be seen in the results of the case studies. All interviewed companies make use of other 'bricks' based on their needs and their phase. This use of the different parts of the TOP program and it impact on the different capitals in the EiN model turned out to be a little bit different then was expected out of the literature. In the opportunity recognition phase other mechanisms also are used besides the one that should be delivered according to the literature. Important to name here are the influence of the courses on the cultural capital and the influence of the mentoring on the strategic capital that the participants name. Both companies in the opportunity recognition phase name this influences.

For the companies in the opportunity preparation phase a similar pattern can be found. More mechanisms are named as being of importance for the development of the capitals of the company. Striking hereby is the fact that mentoring is not named by the participants as being of importance on their strategic capital in this phase. Hereby must be added that this could be due to the fact that all companies that started in this phase already started a company before entering into TOP and as a result already acquired some contacts with an external mentor.

Also the little noting of facilities as being of importance for the economic capital and the top commission on the strategic capital is striking. This is probably also related to the start of the company before entering TOP. two of three companies already acquired business space themselves before entering into TOP. When looking at the strategic capital one should that probably the most participants see the influence of the Top commission on this capital as limited.

The company in the opportunity exploitation phase used even more parts of TOP then expected out of the literature. This is probably the result of the decrease of the capitals as a result of the buyout, something that was mentioned before. As a result, he company was in the opportunity preparation phase again and had to increase its capitals in certain levels again to enter the opportunity exploitation. It therefore is logical that it used some mechanisms that according to the literature are related to the opportunity preparation phase like mentoring to increase the cultural capital and Top commission meetings as being of influence on the strategic capital.

Importance of the various mechanisms

The companies in the case study where also asked to give an indication of the importance of the different parts of TOP. Based on the interviews the Mentoring, and Access to the network of the University were seen as the most important parts of TOP. Courses and facilities were seen as of less

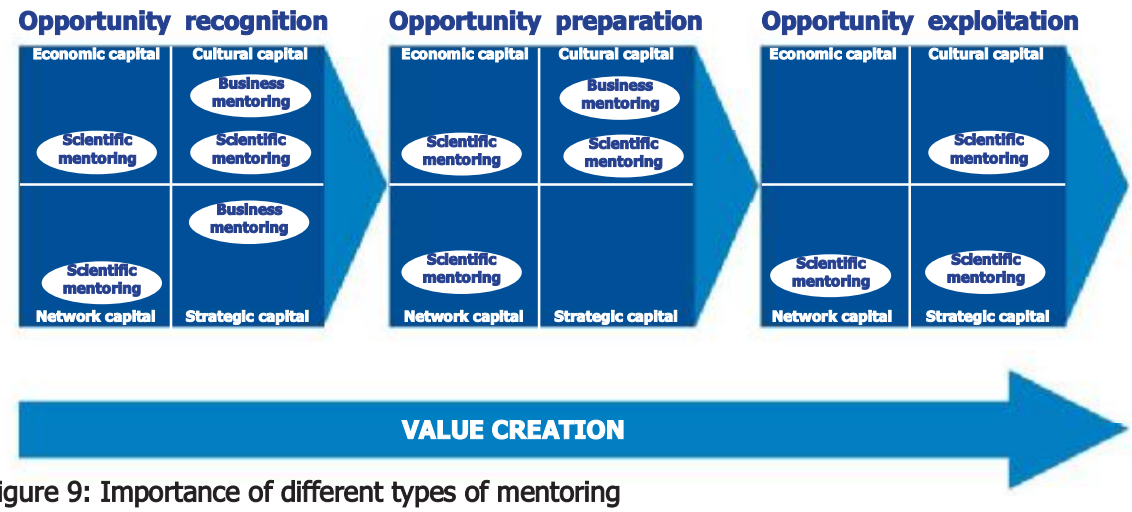


Figure 9: Importance of different types of mentoring

importance. Especially for mentoring this is in line with the impact the function has on the different capitals in the different phases. It is by far the mechanism that is named as being of influence of the development of the different capitals. This is in line with the expectations out of the literature. In the popular business literature the importance of mentoring is widely reported (Kirwan, 2008) so this doesn't sound strange.
Because of the importance of mentoring there should be made a distinction between scientific mentoring and business mentoring. For the TOP program the scientific mentoring turned out to be the most important as can be seen in figure 9.

The strange thing in these is that the influence of the business mentor decreases when a company is entering TOP in a later phase. One should expect that when a company really establishes a product and enters the market, the advice of the business mentor becomes more important. That the contrary can be seen is probably the result of the fact that participants who entered the TOP program in a later stage already developed relationships with people who can advice them with their business. Company F, for instance, used an external mentor from whom they indicated that he had influence on all the capitals of their company. Another explanation is that the scientific mentor also acts as a business mentor, something that happened with Company A or that the participants already has some experience himself and thus doesn't need a mentor, which was the case with Company D. Another explanation is the fact that the scientific mentor is obligatory in TOP and the business mentor not. The scientific mentor therefore plays an more important role in the structure of TOP then the business mentor.

Furthermore, the scientific mentor also has benefits from the development of the company because it is developed in a field that also is of importance for the scientific mentor. Besides this as a result of the possible placement of the participant at the department of the scientific mentor the contact will also be more frequent and as a result the relationship probably will develop into a better relationship. For the contact with the business mentor the initiative primarily lies with the participants. This has the disadvantage that when a participant doesn't make contact, nothing happens and no relationship is established especially because the relation is not obligatory.
Another problem explaining the little influence of the business mentor is the fact that the matching of the participant with the business mentor. Preferably this happens based on the personal network of the participants but in other cases they are selected based on their former participation in TOP and the nature of their buainwaa. Hereby the problem is that future competitors off course can't be matched. This makes that the business mentor often is in a field that is only slightly related to the things the participants does and thus of less interest for the participants. Further the business mentors often are very busy themselves and not always benefit from it themselves. Something that probably will of importance for the establishing of a relationship. This is underlined by the fact that some participants indicate that they didn't trust their business mentor or that their business mentor couldn't help them.

Limitations

First there is the fact that this research used

a quite sample from just one business development program. This makes it less general applicable. Further most of the differences between the expectation out of the literature can be explained by taking into account that the expectations out of the literature are general and the results of the research are more company dependent. Maybe if other companies were selected the results could have been very different. Therefore a quantitative research should be done to investigate whether in general this is also the case.

Implication for practice

The above indicates that it is quite difficult to link a support mechanisms to a certain phase in the development of a high tech potential. Different participants showed different use of the mechanisms, with different influence although there was some general pattern. Mentoring was important, especially the scientific mentoring. Because the use of the mechanisms is quite random, dependent of the phase of the company is in before entering a business development program it is important that a business development program has a broad range of instrument from which every participant can take the one's he needs. Otherwise one should add a screening for every phase and a different focus for every phase which would make the program even more labour intensive.
The nature of the support mechanism (obligatory or not) can be of great influence because it makes that participants really use it. One therefore should think whether one should make a certain mechanism obligatory. In this light it is also the question whether a business mentor is of enough importance in a program in which another mentor, the scientific mentor is obligatory. Probably in programs in which this link doesn't exist, the business mentor also will be more important dependent on the phase the company is in when entering the program.

Implications for further research

Future research should investigate the findings of this paper in a more quantitative way to determine whether they are more general applicable. Another interesting thing to look at is the mentoring relationship. Important things in these are the differences between a relationship with a scientific mentor and one with a business mentor. Another interesting thing to look at is the actual support delivered by the relationship and how this is seen by the participant and the mentor.
In chapter 2 we indicated that it is difficult to determine a 'general' business development program. Interesting would be to research characteristics of a effective business development program. Based on this research we could name some, but it was not the first goal of the research. This kind of characteristics already are researched for more specialistic programs like formal mentor programs (Allen et al, 2006) and it would be interesting to do the same for business development programs. As a basis the different case studies (Klofsten, 2008);(Kirwan, 2008) out of the literature could serve.

4 Harvesting the results of the mentoring process of knowledge intensive startups

Abstract

Mentoring is often used by business development programs to assist startups. In this paper we look at the perceptions of protégés and mentors about this process, hereby different business development programs in Europe were incorporated. It was hypothesized that there is a relationship between contact frequency and amount of support delivered to the protégé. This hypothesis was partly supported. Furthermore we hypothesized that if the amount of support is higher that the positive associated outcomes like trust and benefits to the protégé also will be higher. This hypothesis was mainly supported for the benefits of the protégé. Last also the relation between short and long term outcomes was hypothesized. The research showed that there is a relation between the benefits and the profoundness of the relation in the long term. The corresponding implication for program managers are discussed below.

Introduction

Mentoring as a research subject has received a lot of attention in the past few years. It is considered of crucial importance by many authors for the career, academic, and psycho-social development of people (Bierema, 2002). Especially the impact of structural factors surrounding mentoring relationships, and characteristics of mentors and protégés have received a lot of attention by authors (Young & Perrewé, 2000). Despite this interest in mentoring, the focus on has been narrow in the sense that most research is about business mentoring and mentoring for career development (Whitely & Coetsier, 1993; Ritchie & Genoni, 2002). Mentoring for entrepreneurs has got less attention, although some research has been done on it (Waters et all, 2002; Sullivan, 2000; Akmaliah et al, 2007) and the benefits to the survival and growth of small and medium sized enterprises is acknowledged (Wikholm et all, 2005; Cull, 2006). The added value of a mentoring relationship for a small and medium sized enterprise even seems 'longer-term' (Sullivan, 2000). Nevertheless, the role of mentoring in the support of starting entrepreneurs has received "scant empirical investigation" (Waters et al. 2002). The present study investigates mentoring of starting entrepreneurs; different from Waters et al (2002) in that it is done for more than one business development program for knowledge intensive startups across Europe. The research focuses on the mentoring process and its short and long term outcomes instead of antecedents or structural factors (Young & Perrewé, 2000) and the mentorship phases, functions and outcomes (Chao, 1997). The question we ask ourselves in this paper therefore is how does the mentoring process influence the outcomes of the mentoring relationship in a business development setting?

Theoretical background & Hypotheses

Mentoring takes place in a variety of socio-economic contexts (Sullivan, 2000) and with different objectives like psycho-social development (Grossman et al, 1998), academic development (Young & Perrewé, 2000) and career development (Whitely & Coetsier, 1993). Its precise function may change depending on the context and associated objectives of the mentoring relationship (Sullivan, 2000). In the literature there seems very little agreement about an accepted definition of mentoring (Broadbridge, 1998; Sullivan, 2000; Bierema et al., 2002). Some authors see mentoring as an one-to-one relationship between an "experienced person and a less experienced person that provides a variety of developmental functions" (Waters, 2002; Tabbron et all., 1997). Group mentoring (or co-mentoring) is e.g. defined as "supplied by a more or less tightly constructed group of professional colleagues" (Ritchie et all., 2002). Also, there is the difference between mentoring and coaching that is that is not always that clear. Things that are seen as mentoring by one author, can be seen as coaching by another. For this research we distinct mentoring from coaching following Tabbron et all. (1997) who argue that coaching "has a more immediate performance-based focus".

Mentoring, as said before, takes place in a variety of socio-economic contexts and as such its precise form and role may differ. One example is e-mentoring (Bierema et al, 2002). This kind of mentoring has arisen thanks to the advancements of information

communication technologies (ICT).
Apart from the means of communication another different forms of mentoring identified in the literature namely peer mentoring and hierarchical mentoring. In this peer mentoring is seen as a mentoring relationship between two individuals who hold a comparable position in terms of status and experience (Ensher, 2001). With hierarchical mentoring, in contrast, the protégé holds a lower position in terms of status and experience then his or her mentor.
One distinction that is found in almost every article about mentoring is the distinction between two main forms of mentorship: formal and informal. (Young & Perrewé, 2000; Waters et all,2002; Broadbridge,1998; Wikholm, 2005). The difference in these two lies primarily in the way the relationship is arranged. With formal mentorship programs the relationship is arranged by a third party who sees the pairing of two (or more) members (of an organization or program) as important for the development of at least one of the two. Often this relationship is the result of a "formal organizational policy" (Broadbridge, 1998) or a "conscious effort by decision-makers to pair together members of an organization" (Young & Perrewé, 2000). Informal mentor relationships in contrast are arranged by two (or more) people themselves, they choose to enter into an relationship from which they can benefit in the development on certain aspects like career development or academic development. "It is a private arrangement between two individuals" (Broadbridge, 1999)that often is the result from "a personal bond between two individuals that develops from common interests, goals, and accomplishments". (Young & Perrewé, 2000). According to some research there is a difference between the length of such programs, while formal programs typically run over one year, informal mentoring relationships can last from three to six years (Kent, 2003). In this paper mentoring will be seen as a one-to-one relationship between an experienced person and a less experienced person that provides a variety of developmental functions (Waters et al, 2002)

Stages of mentor relationships

Kram (1983) identified four distinct stages of evolution through which a mentoring relationship progresses: Initiation, cultivation, separation and redefinition. The different phases named above are associated with different forms of support (Chao, 1997; Young & Perrewé, 2000), namely career-related support and psycho-social support. These different behaviors will be explained in the next section. As a result of these differences between phases found by other researches, when studying a mentor relationship it is important to determine in which phase the relationship progresses. Not only to give a complete overview, but also because it can give us some better understanding of the different phases.

Thereby it can help us determine whether these phases also are applicable to formal mentoring programs that last for only a short period of time. The focus of this study namely is on formal mentoring programs in a business setting with the mentor being more experienced then the protégé. These programs in formal form only last a year and afterwards they continue or not depending on the entrepreneur and his mentor.
The corresponding relationships are based on Kram's theory (1983) in the initiation or cultivation phase. We will research the link between the frequency of contact, the perceptions of both the mentor and the protégé on the functions enacted and the perceived outcomes. Hereby the perceptions of the received support is based on the perceived exchange behaviors and the resulting outcomes. In the next section an explanation will be given of the specific variables that are of importance for our research, the theory that makes up our research model and the related hypotheses.

Role behaviors and Outcomes of the relationship

Degree of mentoring

Degree of mentoring in this research is the frequency and quality of contact. The frequency of contact often is named as something that can be determine if a mentoring relationship will be successful or not and may affect the dynamics of the mentoring relationship(Bierema et all., 2002; Allen et all., 2003). Therefore, one can say that a lack of contact may be detrimental (Waters, 2002). Frequency in the literature is named as something that should be investigated to explain differences in outcomes (Whitely et all, 1991; Dubois, 2005) therefore our first hypotheses are:

H1a: The frequency of the support is of

influence on the amount of support that is received by the protégé.

H1b: The intensity of the support is of influence on the amount of support that is received by the protégé.

Role behaviors

Mentoring support is divided by Kram (1983) into career-related and psychosocial functions. Career-related functions are directly related to the protégés career advancement (Chao, 1997). These functions help the protégé to acquire the skills and knowledge required to succeed in an own business (or organization) (Sullivan, 2000). These function include sponsorship, coaching, exposure-and-visibility, protection and challenging assignments (Kram, 1983).Psycho-social functions are more related to the clarity of identity and competence (Chao, 1997). These functions include role modeling, acceptance-and-confirmation, counseling and friendship (Kram, 1983).

For our research we will look at the role of career-related and psychosocial support in earlier stages of the mentoring relationship. At this time the psychosocial support and career-related support become more important according to Chao (1997). In their article Waters et all (2002) tried to establish the difference between psycho-social support and career-related support. They tested the hypothesis that "mentors will provide higher levels of the career-related function than the psycho-social function" (Waters et all., 2002). This hypothesis was rejected but could be interesting to look at for more then one program. So our next hypothesizes are:

H2a: There is a match in the perception of the mentor and protégé about the psychosocial support given to the protégé

H2b: There is a match in the perception of the mentor and protégé about the career-related support given to the protégé

Short term outcomes of the relationship

The outcomes of the mentoring relationship have been examined in different ways. Outcomes that were studied were for instance business success (Waters et all, 2002), career outcomes (Whitely, 1999) and relationship effectiveness (Young & Perrewé, 2000). Following Young and Perrewé (2000) we will focus on the perceived relationship exchange quality to look at the outcomes of the mentoring. To determine these outcomes we will focus on two factors related to perceived relationship exchange quality, the perceived benefits and trust. Trust is chosen following Young & Perrewé (2000), who identified it as an outcome of the mentoring relationship. Perceived benefits is one of components of relational quality identified by Allen et all. (2003) along with satisfaction with the relationship and relational depth.

Perceived benefits

The benefits of mentoring have received a lot attention among researchers (Broadbridge, 1999). This is especially true in career mentoring where mentoring has been linked to (among others) career satisfaction (Whitely & Coetsier, 1993; Chao, 1997), career satisfaction and promotion (Whitely & Coetsier, 1993). When talking about mentoring for the self-employed, the outcomes have been examined to a lesser extent. In the literature mentoring often is seen as a two-way learning relationship from which both the mentor and protégé benefit (Ritchie 2002); (Clutterbuck 2002). Theorists in the field of career mentoring have identified a number of potential benefits associated with becoming a mentor (Ragins & Scandura, 1999). The primary benefit according to Ragins & Scandura (1999) is "the sense of satisfaction and fulfillment received from fostering the development of a younger adult". This benefit can be translated to mentoring for self-employed but one should take into consideration that for a starting entrepreneur the benefits for his business are seen as most important. This is the purpose of the different business development programs and therefore also of the mentoring part of those programs. The perceived benefits for the entrepreneur examined in this study, therefore, are those benefits associated with a direct or indirect impact on the business of the entrepreneur.

H3a: If the perceptions of support to the protégé are higher, the associated benefits for the mentor and protégé also will be higher

Trust

Trust is a variable that is seen one of the essential components of cooperative relationships like a mentoring relationship (Bierema et all, 2002; Smith et all, 1995). According to McAllister et al (1995), the trust in a rela-

tionship between people can be divided into Affect-based trust and Cognition-based trust. These dimensions of trust can be linked to the types of role behaviors,. Affect-based trust consists if the emotional bond between people (McAllister, 1995), quite similar to psycho-social support. Cognition-Based trust is trust based on knowledge available (McAllister, 1995), somewhat related to career-related support. It therefore is logical that according to Young & Perrewé (2000) engaging in sufficient amounts of role behaviors that meet expectations will result in trust because those role behaviors represent different forms of trust.

H3b: If the perceptions of support to the protégé are higher, the associated trust in the other party for the mentor and protégé also will be higher

Long term impact

In our opinion it is also of importance to see whether the relation is continued after the program. This can tell us if the development of the relation in case of a business development program is in line with the findings of Kram (1983). Hereby the outcomes of the relationship determine whether both parties are willing to continue the relationship therefore we propose the next hypotheses.

H4a: If as a result of the relationship the benefits were higher then the profoundness of the relationship in the long term also will be higher.

H4b: If as a result of the relationship the trust in the other party was higher then the profoundness of the relationship in the long term also will be higher.

Impact of different types of mentors

In the programs under study different types of mentors are used. These different types can be divided into business mentors and scientific mentors. Business mentors in essence are meant to assist the protégés with business related problems while scientific mentors most of the time are linked to the University and support the protégés in a more scientific way. It would be interesting to see whether there is a difference between the amount if support delivered by the different types of mentors because this insight can be used by program leaders of business development programs to improve their programs. We therefore propose the last hypothesis:

H5: A scientifc mentor and a business mentor differ in the amount of support they deliver to their protégé

Method

Sample

This study focuses on a particular form of mentoring, mentoring as a mechanism to support starting entrepreneurs at Universities. Data was collected from two separate groups of individuals who were in a formal mentoring relationship as a result of a business development program at a Universities. Hereby participants of these business development programs were targeted as protégé questionnaire. People who were paired with participants of these programs to assist them during the program as a mentor in the scientific or business field

	Protégés		Mentors		
Country	**Contacted**	**Respons**	**Contacted**	**Respons**	**Type of mentor**
The Netherlands	85	30	36	12	Both types
Sweden	98	16	49	11	Business mentor
United Kingdom	14	8	13	2	Both types
Ireland	8	3	15	7	Business mentor
Finland	1	0	7	6	Business mentor
Total	206	57	120	38	

Table 1: Respons of the questionnaire

were targeted for the mentor questionnaire. The business development programs, more specific the mentoring part, under study are conducted at universities in the Netherlands, Sweden, the UK, Ireland and Finland. The programs differed in the sense that some programs only assigned a business mentor to the entrepreneurs while others assigned both to them. Ultimately 206 entrepreneurs were contacted of which 57 responded, a response rate of 28%. Some of these entrepreneurs had filled in the questionnaire for one mentor and others for both their scientific mentor and business mentor, the corresponding totals are between brackets in table 1. For the mentor sample 120 business and scientific mentors were contacted all linked to the same programs as the entrepreneurs. 38 of them responded which gives a response rate of 32%.

Operationalization of the research variables

In this section the operationalization is given of the research variables as those are used in the different questionnaires. A summary of this operationalization is given in table 2. The operationalization is divided into three parts; the role behaviors, the mentoring

Variable	Operationalization	Origin	Measure	Cronbach alpha
Trust (11 items)	Availability Competence Consistency Fairness Trustworthy Integrity Loyalty Openness Promise Fulfillment Overall trust Receptivity	Butler, 1991	4 point-Likert	0,949 (for the protégé sample) 0,910 (for the mentor sample
Perceived mentor/protégé benefits (6 items)	Creativity Internal satisfaction Career advancement Trust Recognition Obtain valuable information	Ragins and Scandura, 1999	7 point-Likert	0,959 (for the protégé sample) 0,864 (for the mentor sample
Psychosocial support (4 items)	Personal satisfaction Personal development Emotional support Friendship	Waters, 2002	5 point-Likert	0,885 (for the protégé sample) 0,725 (for the mentor sample
Content/Career-related support (5 items)	Technical matters Economic/Financial matters Market matters Organizational matters Strategic matters	Waters,2002; TEMO model	5 point-Likert	0,779 (for the protégé sample) 0,760 (for the mentor sample
Long term impact (4 items)	Contact Advice Collaboration Influence		4 point-Likert	0,839 (for the protégé sample)

Table 2: Operationalization of the research variables

outcomes and the long term impact.

Role behaviors

Following other research the role behaviors are tested by dividing them into two types: psychosocial support and career-related support. For the psychosocial support the scale of Waters et all (2002) is used. This scale consists of 4 items with a response scale ranging from "A slight extent" (1) to "A large extent" (5). All 4 items are tested on the perception of the respondent on the support received and given. One example items s "To what extent do you get personal satisfaction from the relationship you have with your mentor?".

For the career-related support we used a modified version of the Waters et all. scale for career-related support. This is because during our interviews with program managers of some business development programs we came along the so-called Technical matters, Economical Matters, Market and Organizational Matters (TEMO) model . All the parts of this model work together to achieve the Vision/Strategy of the entrepreneur. We modified the Waters by inserting the TEMO parts and the corresponding Strategy into the Waters model to come to a 5 item scale with the same response scale ranging from "A slight extent" (1) to "A large extent" (5). One example item is "To what extent do you provide your protégé with advice about Technical Matters?".

Short term outcomes

To test the Trust as an outcome of the relationship the Trust scale of Butler (1991) was used following Young & Perrewé who used it in their research. This scale consisted of 10 items on a 4 point likert scale ranging from Agree (1) to Don't agree (4). An example of an item is "My protégé is honest".

For the perceived benefits we used a part of the mentor benefit scale developed by Ragins & Scandura (1999) and translated this for the protégé. The scale consists of a 7 point Likert scale ranging from "Strongly disagree" (1) to "Strongly agree" (7), 10 items for the mentor and 8 items for the protégé. One sample item is "The rewards that come from the mentoring relationship with my mentor more than compensate for the costs."

Long term impact

This scale consisted of 5 items tested on a 4point-Likert scale with sample items like "the relationship with my mentor has developed into a collaborative relationship". This long term impact only was tested for the protégés.

The resulting questionnaire

The questionnaire is constructed based on the theory given above. A Dutch, English and Swedish version of the questionnaire were thought of, but ultimately an English and Dutch version were made one for the protégé and one for the corresponding mentor. These questionnaires were checked by several specialists and some target respondents before it was put out.

Analysis & Results

The two resulting samples of this study were analyzed separately. Descriptive statistics and correlations were calculated for all variables and are presented in table 4. The different hypotheses were tested with non-parametric tests and linear regression.

Perceptions of support given

Before looking at the short term impact of the mentoring relationship for the protégé we first studied whether the perception of psychosocial and career-related support received and given differed between the protégé and his or her mentor. To test this we carried out a Mann-Whitney U test of which the results are given in table 3. The results for the mentor and protégé sample together (see table 3) show that for psychosocial support the perceptions match and for career related support they do not. In the perception of the mentors the amount of career-related support they give is significant higher then the amount the protégés say they receive. The second hypothesis therefore is only partly supported.

Variable	N	Mann-Whitney U	P-value
Psychosocial support	99	918,000	0,805
Career-related support	94	648,500	0,022*

Table 3: Perceptions of support given (* significant at 0,05 level, ** 0,01 level)

Protégé sample	N	Means	SD	1	2	3	4	5	6
1 Contact frequency	74	2,3	0,87	NA					
2 Psychosocial support	73	12,32	4,65	-0,454**	NA				
3 Career-related support	66	14,33	4,86	0,239	0,430**	NA			
4 Protégé benefits	65	38,6	12,00	-0,369**	0,788**	0,594**	NA		
5 Trust	71	13,92	5,56	0,284*	-0,573**	-0,260*	-0,517**	NA	
6 Long term	62	14,47	4,24	0,400**	-0,653**	-0,340**	-0,676**	0,513**	NA
Mentor sample	**N**	**Means**	**SD**	**1**	**2**	**3**	**4**	**5**	
1 Contact frequency	35	2,26	0,56	NA					
2 Psychosocial support	26	12,46	3,04	-0,383	NA				
3 Career-related support	28	16,75	4,23	-0,327	0,219	NA			
4 Trust	32	14,19	4,86	0,438*	0,075	-0,10	NA		
5 Mentor benefits	26	43,08	9,81	-0,429*	0,624**	0,085	0,316	NA	

Table 4: Correlations between the variables for both the protégé and the mentor sample (*correlation significant at 0,05 level (2-tailed), ** 0,01 level)

Frequency and support

Hypothesis 1 stated that the frequency and intensity of the support were of influence on the amount of support that was received. This hypothesis were tested using regression analysis, below the results of this analysis are given, beginning with the protégé.

Protégé and Mentor

For the protégé the regression showed a significant relationship for the frequency and intensity with the psychosocial support (see table 5). For the career-related support only a relationship was found for the intensity of the relationship. The frequency didn't show a significant relationship. For the mentor sample no relationship was found between the frequency, intensity and the given psychosocial and career-related support.

Short term outcomes

Hypotheses 3a and 3b were about the short term outcomes of the relationship, trust and benefits and their relation to the amount of support received by the protégé. These relationships also were tested with regression analysis which results can be found in table 5 for both the protégé and mentor sample.

Protégé

For the protégé sample only the relationship between psychosocial support and trust was significant. Career-related support didn't show a significant relationship with trust and the hypothesis therefore only is partly supported for the protégé sample. Between the amount of support and the protégé benefits the relationship turned out to be significant for both career-related and psychosocial support. This supports the hypothesis that when the protégé received more support he

Protégé	Dependent: Pyschosocial support				Dependent: Career-related support			
Variables	Béta	Adj. R^2	F	df	Béta	Adj. R^2	F	df
Frequency	-1,267**	0,467	29,942	2,64	-0,230	0,301	14,131	2,59
Intensity	2,018**				2,328*			
Protégé	Dependent: Trust				Dependent: Protégé benefits			
Variables	Béta	Adj. R^2	F	df	Béta	Adj. R^2	F	df
Psychoso-cial	-0,574*	0,271	12,361	2,59	1,504*	0,685	66,239	2,58
Career-re-lated	-0,190				0,953*			
Mentor	Dependent: Pyschosocial support				Dependent: Career-related support			
Variables	Béta	Adj. R^2	F	df	Béta	Adj. R^2	F	df
Frequency	-1,867	0,133	2,913	2,23	-1,867	0,026	1,363	2,25
Intensity	0,341				0,357			
Mentor	Dependent: Trust				Dependent: Protégé benefits			
Variables	Béta	Adj. R^2	F	df	Béta	Adj. R^2	F	df
Psychoso-cial	0,113	-0,073	0,181	2,22	1,788*	0,294	5,791	2,21
Career-re-lated	-0,108				0,213			

Table 5: Regression results for both the mentor and protégé sample (* significant at 0,05 level, ** significant at 0,01 level)

also will enjoy more benefits as a result of the relationship.

Mentor

For the mentor there is only a significant relationship between the psychosocial support given and the benefits they experience themselves as a result of the relationship. The amount of trust in the partner in contrast turned out to be independent of the given psychosocial and career-related support (See table 5). The same is true for the relationship between career-related support and mentor benefits.

Long term outcomes

In hypothesis 4 we proposed that if the outcomes in the short term were higher, the likely hood that the relationship continued and changed into a more profound relationship was higher. We tested this for the protégé sample using regression analysis. The results of this analysis can be found in table 6. The results showed us that there is a relationship between the benefits a protégé experienced as a result of the relationship and the profoundness of the relationship in the long term. Trust by contrast didn't show a relationship with the continuation of the relationship in the long term.

Difference between support of types of mentors

Last we looked if there is a difference between the scientific mentor and the business mentor. We proposed that there was a difference between the perceptions of the protégé for the different variables between the support received from a scientific mentor and a business mentor. The differences in these perceptions were tested using the Mann Whitney test, from which the results

Mentor	Dependent: Long term			
Variables	Béta	Adj. R^2	F	df
Trust	0,05	0,294	21,625	2,55
Protégé benefits	-0,220			

Table 6: Protégé long term outcomes (* significant at 0,05 level, ** significant at 0,01 level)

Variable	N	Mann-Whitney U	P-Value			
Psychosocial	73	574,5	0,528			
Career-related	66	315,5	0,033*			
Contact frequency	74	557,5	0,238			
Trust	71	587	0,855			
Protégé benefits	65	484,5	0,763			
Long term	62	361	0,2			
Mean ranks	**Psychoso-cial**	**Career-related**	**Contact frequency**	**Trust**	**Protégé benefits**	**Long term**
Business mentor	35,77	37,43	39,61	36,35	32,42	33,74
Scientific mentor	38.98	27,06	34,22	35,46	33,87	27,70

Table 7: Differences between types of mentors according to the protégé (* significant at 0,05 level, ** significant at 0,01 level)

can be found in table 7. The results show that protégés have the same perceptions for all variables except for the career-related support for which the difference was significant. The mean ranks (table 7) show that the amount of career-related support received is higher for the business mentor then for the scientific mentor. The protégé thus indicate that they receive more career-related support from their business mentor then from their scientific mentor. Hypothesis 5 thus is only supported for the career-related support.

Discussion

This paper studied the results of a mentoring program as a business development mechanism for knowledge intensive entrepreneurs. The cases under study consisted of business development programs all over Europe with different arrangements when looking at the form of mentoring (scientific or business). Interesting is that the study not only deals with characteristics of the relationships such as exhibited role behaviors and frequency of contact but also looks at the short and long term impact of the relationship and the difference between the support of a business mentor and a scientific mentor.

Frequency and Role behaviors

First, the relationship between frequency/intensity of contact and the amount of support given was researched. The results of the questionnaire indicated that only for the perception of the protégé the frequency and intensity are of importance for the amount of psychosocial support they receive from their mentor. For career-related support only the intensity of the relationship turned out to be of influence. The results for the mentors didn't indicate a similar perception about the relationship between the frequency/intensity of the contact and the support they delivered to their protégés. The results for the protégés indicate that contact intensity probably is more important for the perception of provision of psychosocial and career-related support then the contact frequency. This is in contrast with the findings of Waters et all (2002) who argued that especially frequent contact is of importance in the first stages of a mentoring relationship to ensure that it fulfills its function, supporting the protégé.

Outcomes of the relationship

Outcomes of the mentoring relationship have been studied by a number of researchers but for the most researches this was restricted to the short term outcomes. The long term effect of these outcomes on the continuation and profoundness of the relationship has not been studied yet. Here we did both. For the short term outcomes we looked at Trust and Benefits. The results indicate that according to the perceptions of the protégé there is a relationship between the provision of psychosocial support and the amount of trust in the partner. This is in line with the findings of Young and Perrewé (2000). Further the results indicated that there is a relationship between the provision of career-related and psychosocial support and the benefits a protégé has of the relationship.

The perception of the amount of support they provided for the mentors didn't turn out to be related to outcomes like trust in the partner and benefits for themselves. Only the psychosocial support they provided to their protégé was of influence on the benefits they say they got themselves out of the relationship.

For the long term outcomes we looked at the continuation of the relationship and whether it had deepened after the relationship. The benefits a protégé had encountered as a result of the relationship turned out to give a good indication of the long term continuation and profoundness of the relationship, while trust did not. The benefits of a relationship in the short term thus determine whether a mentoring relationship will continue in the long term.

Difference between types of mentors

Another interesting thing to look at was whether protégés indicated the same frequency of contact, provision of support, short term outcomes and long term outcomes. It turned out that for all variables except career-related support according to the perceptions of the protégés the results were the same. Career-related support received from the business mentor was seen as higher then from the scientific mentor.

Limitations

Although the research is done with all possible prudence, some marginal notes have to be made. First there is sample. Ideally it had consisted of mentors and protégés that were in a mentoring relationship together. In this way the results of the two could have been paired and compared to come to results that are even better. Then there is the size of the current sample. Preferably this would have been a little bit higher, especially for the mentors. Furthermore, some countries can be a little bit overrepresented (The Netherlands, Sweden). This is a result of the contacts of the authors and the willingness of other business development programs in Europe to participate. Moreover, the differences between the organization of the mentoring programs can have been of some influence although the matching etcetera happened in a similar way across all the programs.

Implications for programs/managers

The above research has some interesting implications for program managers of business development programs. First there is the relationship between the intensity of the relationship and the amount of support delivered by the mentor. This logically makes the matching of the mentor and the protégé even more important because a good match will ensure an intensive relationship. Frequency of contact in these is of less importance, so it is the question whether forced contact will help the relation to fulfill its functions. Mentoring cannot be forced, forcing people to pair up only rarely leads to positive outcomes (Bierema et al, 2002). Secondly, there is the minor difference between the support of scientific and business mentor and the outcomes of this support. This makes it logical for a program manager to reconsider the use of both a scientific and business mentor in a program because it could be that their support overlaps.

Further research

Ideally, further research should consist of paired up mentors and protégés. This is quite difficult as the current research showed, but it will give the best results. An interesting subject to look at would be the matching of the mentor and the protégé. If different ways of matching could be related to the outcomes of the relationship this could help program managers to improve their programs. Another interesting subject to research would be e-mentoring. This kind of mentoring doesn't incorporate face-to-face contact which could make psychosocial support somewhat more difficult. It therefore is interesting to research if it works in the same way as 'normal' forms of mentoring. The current research indicated that trust maybe not so important for continuation of the relationship in the long term, which makes e-mentoring even more interesting. Another interesting research topic would be the difference between mentored and not mentored entrepreneurs. Underhill (2006) researched this in a corporate setting, a replication of this research in a business development setting could show interesting results.

5 Conclusions and recommendations

At the beginning of this report we talked about the different functions a University performs. The focus of this research thereby was on a part of the knowledge transfer function; business development programs. This research has given some insight into the impact and most important functions of such programs. In this chapter we will give a short overview of this results by answering the research questions and giving some suggestions for further research.

Research questions

Chapter 3

For chapter 3 we asked ourselves what support mechanisms of a business development program participants use. The research showed that mentoring was among the most important mechanisms for the most participants. This can also be seen out of the answer to the second research question we asked ourselves: How do the mechanisms influence the outcome of the entrepreneurial process and in these which capital of the EiN model is most important?
Mentoring namely turned out to be of influence on most of the capitals of the entrepreneur and thus seems of even more importance. This doesn't mean that universities only should deliver mentoring to people who want to start a business. Although mentoring is of much importance it is still important that program managers keep in mind that different entrepreneurs, need assistance in the development of different capitals and therefore different business development mechanism should still be made available to people who want to start a business.

Chapter 4

In chapter 4 we asked ourselves what results could be harvested as a result of the mentoring process in the short and long term. First the relationship between frequency/intensity of contact and the amount of support given was researched. The results of the questionnaire indicated that only for the perception of the protégé the frequency and intensity are of importance for the amount of psychosocial support they receive from their mentor. For career-related support only the intensity of the relationship turned out to be of influence. In the short term there turned out to be only a relationship between the psychosocial support the protégé gets and the Trust in the partner. The benefits for the protégé in turn had a relationship with both the amount of psychosocial and career-related support. The results of the questionnaire further indicated that trust maybe not that important for a mentoring relationship to continue after a business development program. The benefits one gains from the relationship seem of more importance. This supports the use of e-mentoring and other e-learning environments because in those settings trust is more difficult to develop. Another interesting thing to look at was whether protégés indicated the same frequency of contact, provision of support, short term outcomes and long term outcomes for both types of mentors. It turned out that for all variables except career-related support according to the perceptions of the protégés the results were the same. This could have interesting implications for program managers

Implications for practice

In the literature limited empirical research can be found regarding how formal mentor programs should be organised (Allen et al, 2006). Although the aim of chapter 4 was not to determine characteristics that a succesfull mentoring program should have, the results may help determine potential important characteristics. The difference between scientific mentors and business mentors, for instance, turned out to be relatively small. Associated benefits were seen as similar. This could indicate that just one form of mentoring in a support program could be enough. Based on the results of chapter 3 in the case of TOP, scientific mentoring probably would be preferable. The role of the organization hereby is probably also of importance. In TOP scientific mentoring is made very important because you have to have a scientific mentor to be able to enter into TOP and get an office at the department of your scientific mentor. As a result participants make more use of this type of mentoring and will associate more benefits with it. Another important implication in this is the organization of a support arrangement for companies that are in a later stage of development when entering into the support program. The results of chapter 3 indicate that, as a result of acquired relationships,

these companies need less business mentoring. For these companies it could be interesting to get more help in other areas. The company studied in the opportunity exploitation phase indicated that only the personal loan had impact on his economic capital. To improve the impact of the support program, access to other financial resources such as investors could be interesting. A company in the opportunity exploitation phase could use this resources to make investments to grow further.

The companies in the opportunity preparation phase indicated that TOP had less influence on their cultural and strategic capital. Moreover it was interesting that they declared that they did not make use of the courses. That they did not use them is probably the result of the subjects of the courses (Becoming an Entrepreneur and writing a business plan). A program should incorporate courses for companies in the different phases of the entrepreneurial process. For companies in the opportunity preparation phase the results indicate that a course on strategic management could be one possibility. Strategic management because this would also help the companies with the development of their strategic capital.
The impact of the network part of TOP, according to the participants, primarily is the result of the use of the name of the universty. Of importance hereby is that they indicated that it is some time ago that a network meeting of former participants of TOP has found place. This is something that should be organized in the future.

Another thing missing in the program under study is the use of a webpage with online business development services. This research has shown that, at least for mentoring, trust is not a very important factor but benefits are. As a result mentoring/coaching/advicing by the use of a forum could be used by the TOP program, participant probably will use it as long as they benefit from it. (Former) participants in this would form the basis of the community along with some 'experts' out of the Top commission. This would probably bring other advantages like a shorter respons time of the 'mentor'-forum, more perspectives on a problem, networking and mentoring compared and more.
Other services one can think of in line with the above are document sharing and online courses.

Further research & recommendations

Impact of business development programs

It would be nice to develop a more practical form of the Entrepreneurship in Networks model of Groen (2005). Although it is a nice model, it is still not very applicable for entrepreneurs themselves. By making it applicable it could also be used by the program managers of TOP and thus be more widely spread. This would also be beneficial for researchers because they could more easily make research instruments to research the EiN model in practice.

Also important would be to do a research on the general characteristics of a succesfull business development program. As said before in chapter 3 this could be done by reviewing articles about different business development programs. By reviewing the arrangements and results of the different programs, some general characteristics of a succesfull program can be determined.

Finally, it would be interesting to research the possibilities to incorporate new communication technologies in a business development program. The impact of such arrangements should be researched to determine whether they could really replace the 'face-to-face' support mechanisms. Evans et al (2001) already conducted an exploratory study on online business services, but it would be interesting to incorporate quantitative data.

Research on mentoring

One interesting topic to research in the field of mentoring would be the matching of the protégé/entrepreneur and his or her mentor. Although researchers have identified the importance of the matching for the success of the relationship (Wikholm, 2005), no actual research is done on the matching of persons to ensure a good mentoring relationship. This could also be of interest for program managers because it could tell them how to match the participants of a business development program in the best possible way.
Of interest in these could be research that is done on matching for other purposes like employment (Mortensen, 1988).
Also of interest is an in depth research on

the difference in function between a scientific and a business mentor. This research has shown that there may not be a difference between the outcomes of a relationship with a business mentor and with a scientific mentor. The question is whether they can replace each other or that it is still interesting to use both mentors aside. This for instance could be researched by comparing similar business development programs with as only distinction that one program has scientific mentors and the other has not.
Kram (1983) once identified the roles a mentor plays in the mentoring relationship. It would be of interest whether these roles are still applicable and whether maybe other roles are better applicable to the business development mentoring. Waters et al (2002) already more or less looked at this by developing a scale for career related support, but ideally a lot of case studies should be done in which this is researched just as in the research of Kram (1983). This also can tell us more about the mentoring process itself and how to 'assist' the development of the relation.

More generally it would be best if a research on mentoring would be done by pairwise comparison. Both a mentor and his or her protégé should say something about their relationship and their results should be compared to come to the best possible description of such a relationship. This probably is quite difficult but one solution would be to hand out a questionnaire to the participant of the program and his or her mentor during the last meeting before the end of the program. Then they will be more willing to fill it in (off course dependent of each other!) and in a couple of years a database will come into being that can be used by research to analyse the mentoring relationship in depth. This solution doesn't take much work, just the development of a questionnaire and agreements with the program leader to hand out the questionnaire.

E-mentoring (Bierema, 2002) and the use of forums for "mentoring" support is also an interesting research topic. My research has showed that e-mentoring maybe can also be of interest for entrepreneurs but is this really the case? And what are important characteristics of the relationship in this case? This could be researched by asking the participants of an mentoring site like, for instance, mentornet.net to cooperate and fill in a questionnaire.

Finally, the difference between coaching and mentoring is another topic that should be researched more, just because it is a very difficult difference because of overlapping roles. Klofsten et al (2008) already wrote an article about this topic but more research is needed to really identify the difference between the two forms of support. When looking at this difference it could also be of interest to look at the difference between woman and men in a mentoring relationship

References

Akmaliah Adham, K. & Fuaad Said, M. (2001) Mentoring of Malaysian high-tech entrepreneurs in their pre-seeding phase. in B. Doyle and O Neill N.V., Mentoring entrepreneurs pp. 126-160

Allen, T.D. and Eby, L.T. (2003) Relationship Effectiveness for Mentors: Factors Associated with Learning and Quality Journal of Management 29; pp. 469-486

Allen, T.D., Eby, L.T. and Lentz E. (2006) Mentorship Behaviors and Mentorship Quality Associated With Formal Mentoring Programs: Closing the Gap Between Research and Practice. Journal of Applied Psychology Copyright 2006 by the American Psychological Association, Vol. 91(3); pp. 567–578

Autio E. (2003) High-Potential entrepreneurship. The entrepreneurial advantage of nations: first annual global entrepreneurship symposium

Grossman, J.B. and Tierny, J.P. (1998) Does Mentoring Work?: An Impact Study of the Big Brothers Big Sisters Program. Eval Review 22; pp. 403 - 426

Baron, R.A. (2006) Opportunity Recognition as Pattern Recognition: How Entrepreneurs "Connect the Dots" to Identify New Business Opportunities. Academy of Management Perspectives February pp. 104-119

Bellini, N. (2002). Business Support Services. Marketing and the Practice of regional Innovation Policy. Oak Tree Press, Cork, Ireland

Bierema, L.L. & Merriam, S.B. (2002), E-mentoring: Using Computer Mediated Communication to Enhance the Mentoring Process. Innovative Higher Education, 26(3): 211-227

Broadbridge (1998) Mentoring in retailing: a tool for success? Personnel Review 28(4) pp. 336-355

Butler, (1991) Towards understanding and measuring trust: Evolution of a Conditions of Trust inventory. Journal of Management 13(7), pp. 343-363

Chao, G.T. (1997), Mentoring Phases and Outcomes. Journal of Vocational Behavior, 51: pp. 15-28

Cull, J. (2006), Mentoring Young Entrepreneurs: What Leads to Success? International Journal of Evidence Based Coaching and Mentoring 4(2), pp. 8-18

Deakins (1998) Entrepreneurial learning and the growth process in SMEs The Learning Organization 5(3), pp. 144–155

De Groot A.D. (1981) Methodologie : grondslagen van onderzoek en denken in de gedragswetenschappen 11e dr / Mouton

Ensher, E.A. Tcompany Ds, C. Murphy, S.E. (2001). Comparison of traditional step ahead, and peer mentoring on protégés support, satisfaction, and perceptions of career success: a social exchange perspective Journal of Business and Psychology, 15(3): pp. 419-438

Etkowitz, E. and Klofsten, M. (2005), The innovating region: toward a theory of knowledge-based regional development, R&D Management 35, 3: pp. 243-255

Evans, D. and Volery T. (2001) Online business development services for entrepreneurs: an exploratory study. Entrepreneurship & Regional development 13, pp. 333-350

Gibb, S. (1994) Evaluating Mentoring. Education + Training 36(5): pp 32 - 39

GEM Monitor Nederland (2006)

Groen, A.J. (2005) Knowledge intensive entrepreneursgip in networks: Towards a multi-level/multidimensional approach. Journal of Enterprising Culture 13(1), pp. 69-88

Habets, M.J.M., van der Sijde, P.C. and Voordijk H. (2007). Adoption of Alternative Transport Technologies in the construction industry. Twente University

Ireland, Reutzel and Web (2005) Entrepreneurship Research in AMJ: What Has Been Published, and What Might the Future Hold? Academy of Management Journal, 48(4), pp.

556-564

Johnson, S.K., Geroy G.D. & Griego O.V. (1999), The mentoring model theory: dimensions in mentoring protocols. Career Development International, 4/7: pp. 384-391

Kent, 2003, An evaluation of mentoring for SME retailers. International Journal of Retail & Distribution Management. 31(8) pp. 440-448

Kirwan P, Van der Sijde P.C., Groen, A.J. (2006), Assessing the needs of new technology based firms (NTBFs): An investigation among spin-off companies from six European Universities Int Entrep Manag J 2:173–187

Kirwan, P. van der Sijde P., Klofsten, M. (2008) Supporting high-tech companies reaching the business platform: about the role of training, coaching and networking Int. J. Innovation and Regional Development, Vol. 1, No. 1 pp. 48-65

Klofsten, M. and Autio, E. (1998) A Comparative Study of Two European Business Incubators. Journal of Small Business Management pp. 30-44

Klofsten, M., Maier J.C. and Heydebreck P. (2000) Innovation support for technology-based firms: The Swedish Teknopol Approach. R&D Management 30 pp. 89-100

Klofsten, M. and Öberg S. (2008) Coaching versus mentoring: Are there any differences? Proceedings High technology Small Firms Conference 2008 ISBN: 978-90-365-2668-5

Kram , K.E. (1983), Phases of the Mentor Relationship. Academy of Management Journal 26(4): pp. 608-625

McAllister, D.(1995), Affect- and Cognition-Based Trust as Foundations for Interpersonal Cooperation in Organizations, The Academy of Management Journal, Vol. 38, No. 1. pp. 24-59.

Mortensen, Dale T. (1988) Matching: Finding a Partner for Life or Otherwise The American Journal of Sociology, Vol. 94, Supplement: Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure pp. S215-S240

Nikos progressreport (2005)

Ragins, B.R. and Scandura, T.A. (1999) Burden or blessing? Expected costs and benefits of being a mentor. Journal of Organizational Behavior 20: pp. 493-509

Rasmussen, E. (2005), The process of new venture creation in a university setting, Accompanying measures & survival of new firms : between Darwinism and assistance, Colloque – 26 mai 2005 - Montpellier

Rasmussen, E. (2004), the university spin-off process, Conferencepaper13th Nordic Conference on Small Business Research

Rasmussen, E. (2006). Facilitating university spin-off ventures -an entrepreneurship process perspective. Pd.D. dissertation, Handelshøgskolen i Bodø.

Ripsas S. (1998), Towards an Interdisciplinary Theory of Entrepreneurship . Small Business Economics 10: pp. 103–115

Ritchie, A. & Genoni, P. (2002) Group mentoring and professionalism: a program evaluation. Library Management 23(1/2) pp. 68-78

Rosenberg (2004) innovation and economic growth. OECD report

Russel, J.E.A. & Adams, D.M. (1997) The Changing Nature of Mentoring in Organizations: An Introduction to the Special Issue on Mentoring in Organizations. Journal of Vocational Behavior 51 pp. 1–14

Sarason Y., Dean, T. and Dillard J.F. (2006) Entrepreneurship as the nexus of individual and opportunity: A structuration view. Journal of Business Venturing 21 pp. 286–305

Scandura, T.A. (1998) Dysfunctional Mentoring Relationships and Outcomes. Journal of Management, 24(3) pp. 449-467

Schmidt, W.C. (1997) World-wide Web Survey Research: Benefits, Potential, Problems and Solutions. Behavior Research Methods, Instruments & Computers, 29(2) pp. 274-279

Shan, S. and Venkatamaran, S.(2000) The promise of entrepreneurship as a field of research. Academy of Management Review

25(1) pp. 217-226

Shane, S. (2003) A General Theory of Entrepreneurship: The individual-opportunity nexus. Edward Elgar Publishing, Celtenham, UK

Smith, K.G. , Carroll, S.J. Ashford, S.J. (1995) Intra- and Interorganizational Cooperation: Toward a Research Agenda. The Academy of Management Journal, 38(1) pp. 7-23.

Sullivan, R. (2000), Entrepreneurial learning and mentoring. International Journal of Entrepreneurial Behaviour & Research, 6(3) pp. 160-175

Tabbron, A., Macaulay, S. and Cook S. (1997) Making mentoring work. Training for Quality 5(1) pp. 6-9

Van der Heide, S., Van der Sijde, P.C. and Terlouw, C. (2008) The institutional organisation of knowledge transfer and its implications. Higher Education Management and Policy, 20(3)

Van Praag M.C. (1999) Some classic views on entrepreneurship. De Economist 147(3) pp. 311-335

Van der Sijde, P.C., Groen, A.J., and Van Benthem J. (2004) Academisch Ondernemen aan de Universiteit Twente

Van der Veen, M and Wakkee I. (2004), Understanding the Entrepreneurial Proces, ARPENT pp. 114-152

Waters, L. M. Mccabe, M. D. Kiellerup, D. and S. Kiellerup, S. (2002) The role of formal mentoring on business success and self-esteem in participants of a new business start-up program. Journal of Business and Psychology, 17(1): pp. 107-121

Whitely, W.T. and Coetsier, P. (1993) The relations of career mentoring to early career outcomes. Organization Studies 14/3 pp.419-441

Whitely, W. Dougherty, T.W. Dreher, G.F. (1991), Relationship of Career Mentoring and Socioeconomic Origin to Managers' and Professionals' Early Career Progress. The Academy of Management Journal, 34(2) pp. 331-351

Whitener, E.T., Brodt, S.E., Korsgaard, M.A. and Werner, J.M. (1998) Managers as Initiators of Trust: An Exchange Relationship Framework for Understanding Managerial Trustworthy Behavior. The Academy of Management Review, Vol. 23(3) pp. 513-530.

Wikholm, J., Henningson, T., and Hultman C.M. (2005)- ICSB World Conference

Wong, P.K., Ho Y.p. and Autio E. (2005) Entrepreneurship, Innovation and Economic Growth: Evidence from GEM data Small Business Economics 24 pp.335–350

Yin, Robert K. (2003) Case Study Research: Design and Methods. SAGE

Young, A.M. and Perrewé, P.L. (2000) What Did You Expect? An examination of career-related support and social support among mentors and protégés. Journal of Management, 26(4) pp.611-632

Appendix 1: Interviewprotocol

Short introduction of myself

Part 1: General questions

1. How many personnel does your company have?
2. Did you start your company: Before TOP/during TOP?
3. How would you describe your company?

Part2: Effects of TOP

4. Network/Social capital is about Contacts (mult iplex, filling structural holes, cohesive, equivalent). Ways to increase the level of this capital are for instance: (SOME INTERVENTIONS Relation management, Changing network structure, Using brokers, Supply chain management)
Which of the following parts of TOP did influence the Network capital of your company and how?
A. Personal Loan
B. Business mentor
C. Scientific mentor
D. Top commission meetings
E. Office space
F. Secretarial support
G. Laboratory facilities
H. Course "Becoming an Entrepreneur
I. Network University of Twente
J. "Netwerkmeetings"
K. Name University of Twente
L. Technology Circle/Kring Twente year membership
M. Support with writing a business plan

5. Cultural capital is about the values, organization, knowledge, skills, experience and technology of the company. Ways to increase this capital are for instance (SOME INTERVENTIONS: Training & education, Teambuilding, Organizational systems, New technology)
Which of the following parts of TOP did influence the Network capital of your company and how?
N. Personal Loan
O. Business mentor
P. Scientific mentor
Q. Top commission meetings
R. Office space
S. Secretarial support
T. Laboratory facilities
U. Course "Becoming an Entrepreneur
V. Network University of Twente
W. "Netwerkmeetings"
X. Name University of Twente
Y. Technology Circle/Kring Twente year membership
Z. Support with writing a business plan

6. Strategic capital is about Power, authority, influence, strategic intent etc. of the company. Ways to increase this capital are for instance (SOME INTERVENTIONS: Using power, Redefining strategy)
Which of the following parts of TOP did influence the Network capital of your company and how?
A. Personal Loan
B. Business mentor
C. Scientific mentor
D. Top commission meetings
E. Office space
F. Secretarial support
G. Laboratory facilities
H. Course "Becoming an Entrepreneur
I. Network University of Twente
J. "Netwerkmeetings"
K. Name University of Twente
L. Technology Circle/Kring Twente year membership
M. Support with writing a business plan

7. Economic capital is about money. Ways to increase this capital are for instance (SOME INTERVENTIONS: Using financial incentives, Cost cutting)
Which of the following parts of TOP did influence the Network capital of your company and how?
A. Personal Loan
B. Business mentor
C. Scientific mentor
D. Top commission meetings
E. Office space
F. Secretarial support
G. Laboratory facilities
H. Course "Becoming an Entrepreneur
I. Network University of Twente
J. "Netwerkmeetings"
K. Name University of Twente
L. Technology Circle/Kring Twente jaar lang lid
M. Support with writing a business plan

8. Can you give an indication of the impor-

tance of the different parts of TOP?
Personal Loan

Business mentor

Scientific mentor

Top commission meetings

Office space

Secretarial support

Laboratory facilities

Course "Becoming an Entrepreneur"

Network University of Twente

"Netwerkmeetings"

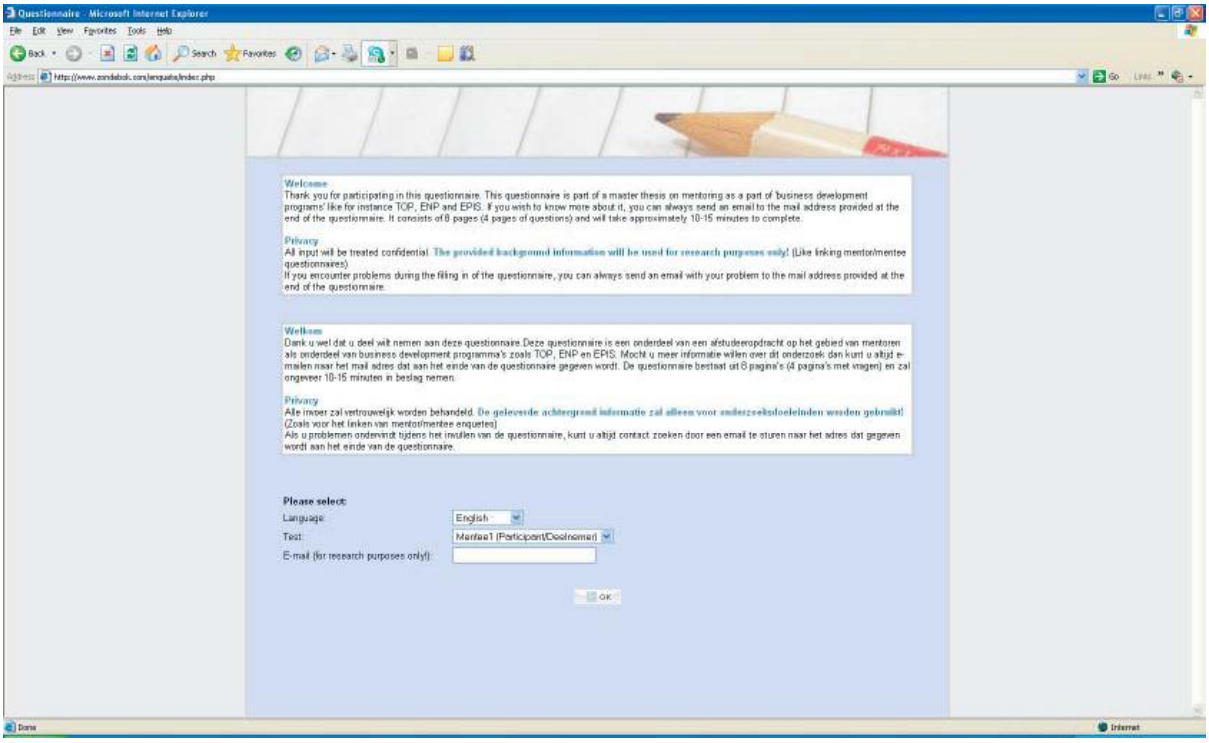
Name University of Twente

Technology Circle/Kring Twente jaar lang lid

Support with writing a business plan

Appendix 2: The webbased questionnaire

On the website www.zondebok.com/enquete three different versions were stored of the questionnaire in 2 languages. One questionnaire for the entrepreneur, one aimed at the business mentor and one at the scientific mentor. The languages were english and dutch. At first also a swedish version was developed but that version turned out to be not usable. Below a screenshot of the login



page is given and an overview of the questions related to every variable. Each question was asked for both the scientific and business mentor and rephrased for the mentor.

Frequency and intensity

Frequency of contact with your business/scientific mentor:

- Daily
- Monthly
- Every 3 months
- Half-yearly
- Yearly (or less)

Mentoring intensity: 'The mentoring in terms of profoundness.'

Business/Scientific mentoring intensity

1 Low <-> 5 High

Trust

1 My .. is trustworthy
2 My .. is available
3 My .. is competent
4 My .. is consistent
5 My .. is fair
6 My .. is honest
7 My .. is loyal
8 My .. is open
9 My .. does what he/she promises
10 My .. is receptive for ideas
(scale 1 Agree <-> 4 Don't agree)

Psychosocial support

Own perspective
1 To what extent do you get personal satisfaction from the relationship you have with your ..
2 To what extent do you get emotional support from your ..
3 To what extent does your .. provide you with advice about your own personal development?
4 To what extent is your relationship with your .. a friendship?

Perspective other party

1 The extent to what he/she gets personal satisfaction from the relationship is:
2 The extent to what he/she gets emotional support is:
3 The extent to what I provide him/her with advice about his/her own personal development is:
4 The extent to what he/she thinks about your relationship as a friendship is

(scale 1 A slight extent <-> 5 A large extent)

Career related support

Own perspective
To what extent does your ... provide you with advice about:
1 Technical matters
2 Economical/Financial matters
3 The Market
4 Organization
5 Strategical matters/Vision

Perspective other party
To what extent, do you believe, is your relationship important for your .. to revive his/her knowledge about:
1 Technical matters
2 Economical/Financial matters
3 The Market
4 Organization
5 Strategical matters/Vision

Benefits

1 My .. enhanced my reputation.
2 The rewards that come from the mentoring relationship with my .. more than compensate for the costs.
3 My creativity increased as a result of the the mentoring relationship with my ...
4 My .. was an important form of support for me.
5 Being mentored by my .. had a positive impact on my business.
6 The mentoring relationship with my .. is a catalyst for for my own innovation.
7 I can count on my .. to be a loyal supporter.
8 My .. was a trusted ally for me
(scale 1 Stongly disagree <-> 7 Strongly agree)

Continuation

1 After the program I stayed in touch with my ...
2 After the program I still requested advice from my .. on certain matters.
3 The mentoring relationship with my .. has evolved into a collaborative relationship.
4 My .. in the mean time has taken a share in my enterprise.
5 The influence of our ... on our business performance was crucial
(scale 1 Agree <-> 4 Don't agree)

Appendix 3: The case studies

Description of the companies and the capitals of the starting entrepreneur.

Company D-SW

Company D Software is a small company that was started by one person, one year before they were granted a TOP-place. At that time the founder came to Enschede because of the presence of the University with an IT department. He had an idea and came to the University with this idea, this idea was adopted by the university and knowledge was used to explore the possibilities. After that a company was established in strong cooperation with a faculty of the University. The University invested in the company and like said before by internships and graduation projects (among others) the cultural capital of the company was developed further. This development continued and nowadays Company D is focusing on control systems in EKKS?. In other words they are developing control software that can be placed into Hoogrendementsketels with some sensors that can tell a service provider more about for instance the time to perform maintenance and more. In the opinion of the founder the role of service provider in the future will primarily lie with companies like Essent and Nuon and to a lesser extent with producers like Remeha and Nefit. Nowadays Company D Software employs 4 people.

The 'capitals' of the starting entrepreneur

The founder says that at the time he was a person with a lot of social contacts, especially in the field in which his company now operates. He had a vision on what he wanted to do (where he wanted to start a company in) and as a result of previous experiences possessed some knowledge of how to start a company. For money he primarily relied on the savings he had build op during his employment before.

Company F

Company F is a reconfigurable computing company that provides IP (intellectual property) for creating advanced digital signal processing platform chips. As a result of a research conducted by one of the founders on coarse-grained reconfigurable computing he and 2 others in 2005 established Company F. A year after the founding they were granted a TOP place. Because of the research the founders conducted before establishing the enterprise, the contacts with the University of Twente were and are good. At the beginning they immediately contacted an external mentor who could help them with the business development. Nowadays Company F consists of 12 people and is growing rapidly. At the time they are in the product development phase. In 2008 they hope to come to a product they can sell and thus will start to do more on marketing to sell this product. Currently they are mainly busy with some R&D projects for the University and some companies.

The 'capitals' of the starting entrepreneur Company F

Paul Heysters has more than seven years experience working in the field of reconfigurable computing. In his career, he worked for high-technology companies in both Europe and the USA, including Ericsson, Philips and Chameleon Systems. Prior to co-founding Company F, he was leading research on coarse-grained reconfigurable computing for the Chameleon project at the University of Twente (The Netherlands) and worked collaboratively with industry organizations. After getting his PhD he decided to commercialise the research and improve it a little bit. After starting the company he and the other founders immediately entered into TOP because that seemed to them a nice practical arrangement to start with. And they got into contact with an external 'business' mentor, Roel Reintsema. In a way you can say that Company F primarily possessed the technical knowledge to start the company. So primarily the cultural capital was available.

Company B Innovation

Jan Company B is still somewhere in-between the opportunity recognition and opportunity preparation stage. According to him he has an idea somewhere on the border of detection, energy and environment. He doesn't want to say what it is exactly because he is scared that someone else will earn money with his idea. The problem is that Company B has not been able, to date, to develop his idea into a product. As an result he hasn't started a business yet. Cur-

rently he is doing research at a faculty at the University to try to develop a product and maybe start a company.

The 'capitals' of the starting entrepreneur

Before TOP, Company B entered into KEB which has some components that are similar to TOP like for instance the courses "Becoming an Entrepreneur" and "helping to write a business plan". Despite this participation he still lacks some knowledge about establishing a company and doing business. In line with this a real strategy/vision is also lacking. He just has an idea, which in his opinion has the potential of becoming booming, but to date it is not clear if his idea can be developed into a real product. When talking about the economic capital one can say that this is lacking as well. He gets a "WAO-uitkering" and lives on his savings. He further says that he has the contacts needed to make his idea a success as result of former employment but after talking to him an image of a technical oriented person who is in love with his one idea remains.

Company C

The founder of Company C has a history in Food Technology and Business Intelligence at a big company in diary products. As a result of this he saw that gathering information about competitors and the market could be very time consuming. When he encountered some problems at his work this idea came back to the surface and he started to think about starting his own company in business intelligence. Ultimately he did enter a business development program, KEB and afterwards TOP and started a company: Company C. Company C is a one-man business but they also make use of students to research the market etcetera. Company C sells products in the field of Business intelligence (BI). BI is the process of pro-actively identifying, obtaining and processing of relevant information for the marketing and strategy forming of a company. Forca hereby is his main product which consists of a search engine that according to the founder gives you a complete overview of all the news from key suppliers in the industry. At the moment the founder isn't able to life from his business, but he expects this to be possible in the coming years.

The 'capitals' of the starting entrepreneur

The founder participated in the KEB program before entering TOP. As a result he has followed some of the courses that are also part of TOP like "Becoming an Entrepreneur" and "writing a business plan". Despite this participation he didn't have much knowledge about starting a company. According to the founder he had a clear vision of what he wanted to do before starting the company, but based on his other remarks this vision needed some adjustments. Financially he didn't have much opportunities, he lives from social-security and has no other income. When looking at his contacts immediately is clear that he has contact in the Foodindustry as a result of his former employment but at the wrong places in an organization. The only real contact he has in the field are with market research agencies. Now we have introduced the different companies in this case study we will give an comparative analysis of the effects the different parts of TOP had on the capitals of the entrepreneurs.

Company E

OptIn Solutions B.V. is a young and innovative organization. Flexibility is key in our products and services, as well as in our overall business approach. Based on the integrated technological foundations, our products and services can be tuned to the individual needs of our customers. This enables our customers to make full use of our methodologies and tools. Navigation system to determine the steps in a process.
The solutions that OptIn Solutions provides are based on two main functional components. These can be configured into stand alone products or as add-on modules for existing software tools, depending on the application and the customer's wishes.

OptIn Integrate

OptIn Integrate enables the efficient and consistent integration of information from separate information systems. OptIn Integrate enables the use of OptIn DBPM in process contexts where information is managed in distributed and disparate systems.

OptIn DBPM

OptIn DBPM enables demand driven, and automated process model configuration. It delivers unprecedented possibilities for process analysis, process modeling, and process execution. OptIn DBPM is the core function-

ality that is applied in all of OptIn's solutions. OptIn Solutions B.V. was founded in 2004 as a spin-off from the University of Twente in the Netherlands. During the Ph.D. research projects of both founders at this university, the basic concepts underlying OptIn's products were developed. In the mean time a range of applications for these products has been developed, and the functionality is still expanding. Characteristic for all applications is the ability to optimize process models, in which ever form they might exist, in relation to actual, real world conditions. OptIn Solutions is constantly working with customers, universities and partners in order to improve its products, solutions and services.
In the meantime the founder has started another company besides Company E with which he does more.

The 'capitals' of the starting entrepreneur

Mentink was doing a Ph.D. research at the university and used knowledge he acquired during this PhD to develop a product and start a company. He thus possessed some cultural capital as a basis to start his company. He also knew what he wanted to do with the product and didn't need economic capital to start.

Company A

Company A & Consultancy is a research and advice organizations that supports organizations by giving them insight and information. In this way them help the organizations to make decisions. They are active in Amsterdam and Enschede and work in different sectors as for example:Media, Education, Financials, Industry and Energy. Company A was started in 2000 as a part of the faculty GW, more specific the communications studies, at the University of Twente. The idea hereby was that thanks to an inhouse company student could learn about practice. The idea behind the company was to keep it as a part of the faculty forever, but that didn't work out. When the founder of Company A wanted to transfer the company to the faculty problems arose. As a result the founder of Company A decided to continue with the company separate from the faculty and so he did. In 2002 he bought te company from the personal loan he acquired as a result of TOP. This also was one of the most important reasons to take part in TOP. The company was bought under certain conditions which gave Company A some advantages during TOP.

The 'capitals' of the starting entrepreneur

Thanks to the time at the faculty of GW the company already acquired a certain level for the different capitals. They had an idea where to go with the company (strategic), they had knowledge to do assignments at customers (cultural) and thanks to the contacts with GW they already had some clients (network). The only problem was the money to take over the company from the faculty (economic).

Impact of TOP

Company D-SW

The founder of Company D-SW didn't make use the personal loan because as a result of former employment he possessed some money to start the company. For the same reason he didn't use the Business Mentor. As a result of former employment he possessed already the knowledge to start a company. He even did it before. Besides that he also already possed most of the contacts needed to start the company because he had been in the same business at another company. And as a result he already had a vision of what he wanted to do.
In contrast the the relationship with his scientific mentor was very important for the founder of Company D-SW. He especially underlines the enthousiasm with which the scientific mentor helped him. This can also be seen in the effects this relationship has on the 4 capitals of Company D. To start with the cultural capital: Before, during and after TOP the scientific mentor gave Company D access to the skills and knowledge available at his faculty. He did this for instance by placing students at Company D for an internship or a graduation project. Some stayed afterwards. Network capital: In a way his Scientific mentor introduced him to new contacts. These primarily had a influence on the technological knowledge in the company. Besides this he also gave Company D access to some testing facilities. This facilities often are named as a separate part of TOP but often are related to the scientific mentor because the access to these facilities often is done through the scientific mentor. The same is true for secretarial support and office space, but the founder of Company

D didn't make use of that. When talking about the TOP commission, the founder of Company D-SW focuses on the contacts some members of the commission helped him establish like for instance for funding, PHDs etc. In this way he has also used the network of the university as you translate the contacts that are established by using the scientific mentor and members of the TOP-commission as contacts of the university. The name of the University of Twente was another help by establishing contacts. It makes you reliable. When talking about the courses like 'becoming an Entrepreneur', 'Writing a business plan' etc. one can say that those were of less importance because of the knowledge that the founder of Company D already possessed. The same is true for the 'networkmeetings' and the Technology Circle Twente membership, he already possessed the contacts needed.

Company F

Company F didn't make use of the personal loan and business mentor delivered by TOP. They already had established a relationship with an external business mentor before they entered TOP. This external mentor helped them with a lot of things. He for instance introduced them to a smart business accelerator who delivered some funding, introduced them to press, designers etcetera. In contrast to the business mentor, their scientific mentor was of some importance for Company F. He and Company F exchanged contacts that where of interest to the both of them, whereby the contacts of their scientific mentor were primarily technical. Besides this their scientific mentor 'delivered' knowledge in the form of students who did their graduation project or internship at Company F. Some even stayed afterwards. The presence at the faculty of their scientific mentor also helped them because they where able to speak to other people with technical knowledge over there and it offered them the infrastructure (laboratory etc.) to work with. In the opinion of one of the founders the TOP meetings were primarily interesting because it helped them to identify problem fields/risks. It helped them also to gain experience in pitching their idea which could be of importance when pitching their idea to other external organizations. The name of the University of Twente was important for them in establishing contacts, because it sounds reliable. The network of the University also may have been of some importance, but it is difficult to say because before starting the company, the founders where part of the University themselves. When talking about the courses like 'becoming an Entrepreneur', 'Writing a business plan' etc. one can say that those were of less importance because they acquired the knowledge in another way. Also the networkmeetings and TCT were of no importance, they didn't use it to establish contacts interesting for their company.

Company C

The personal loan was very important for Company C. As said before his only income is social-security and they need that to life. The loan was used to invest in his company. He first tried to get a loan at some banks, but the interest rates were much higher then the interest rate of TOP. With his business mentor the founder had a couple meetings that mainly had influence on his cultural and strategic capital. He gave him a book about sales to help him acquire knowledge in that field and acted as a 'mirror' to help the founder think about what he wanted with his company exactly and thus what his strategy was. The scienfitic mentor has some more influence on the development of the company. He helped develop the cultural capital of the company by placing some students for their master assignments at the company and acquiring some other students to research opportunities for the company. Besides the cultural capital the scientific mentor also had an influence on the network capital by for instance bringing him into contact with a company that developed company logos etcetera. This was one of the things the top commission helped him with as well. They brought him into contact with some people in the food industry and proposed possibilities for raising money. Further they helped him developing a better vision about what to do by asking questions and suggesting for instance the use of students as temporary employees.
Office space, secretarial support and laboratory facilities were not used because the founder could do anything on his own laptop, although he made use of the library of the university. When seeing that as a kind of 'laboratory facility' one can say that it influenced his cultural capital. The courses offered during TOP were not applicable because the founder already completed those courses in KEB, a business development program before TOP. They definitely had an

influence during KEB and helped him later on when he really started the company.
Again the impact of the network of the university is hard to determine. If one takes the network of the scientific mentor as part of the network of the University, the founder definitely used this network and in this way developed his network capital. The name of the University of Twente was another thing that helped him to develop his network capital because when you use this name people think differently about your business and potential according to the founder. Last he didn't make use of the "netwerkmeetings" and the membership ofTechnology Circle/ Kring Twente..

Company B Innovation

Heimer did use the personal loan but he didn't have a business mentor because he didn't start a company. The scientific mentor in contrast was very important for Company B. He gave him access to certain facilities and helped him also in other fields. He made available the knowledge and competencies of his department and brought him into contact with other persons at the University who could be of interest for the research of Company B. In this way he helps Company B to develop his network capital. Further he appointed him as paid 'flexwerker' at the University and there are plans to apply for subsidy for the research and in this way develop the economic capital. The scientific mentor also suggests other possibilities in the research which has a direct influence on the vision of Company B on the product he tries to develop. The scientific mentor for instance suggested the use of light instead of infrared light. The Top commission was less applicable for Company B because he didn't start a company yet. They meanly supported him by trying to develop his vision on the business side of his idea and by suggesting the possibilities to gather money to invest like for instance by applying for a subsidy. Office space, laboratory facilities and the network of the university he used through his scientific mentor and the contacts of his mentor. So for a large part the influence of these facilities is linked to the scientific mentor and thus in this way has an impact whereby the influence of the network off course primarily was on the network capital of the company. The name of the university also helped him establish contacts because of the reliable image of the university. The networkmeetings and membership of the Technology Circle/Kring Twente he didn't use and the courses Company B did already follow before TOP during KEB.

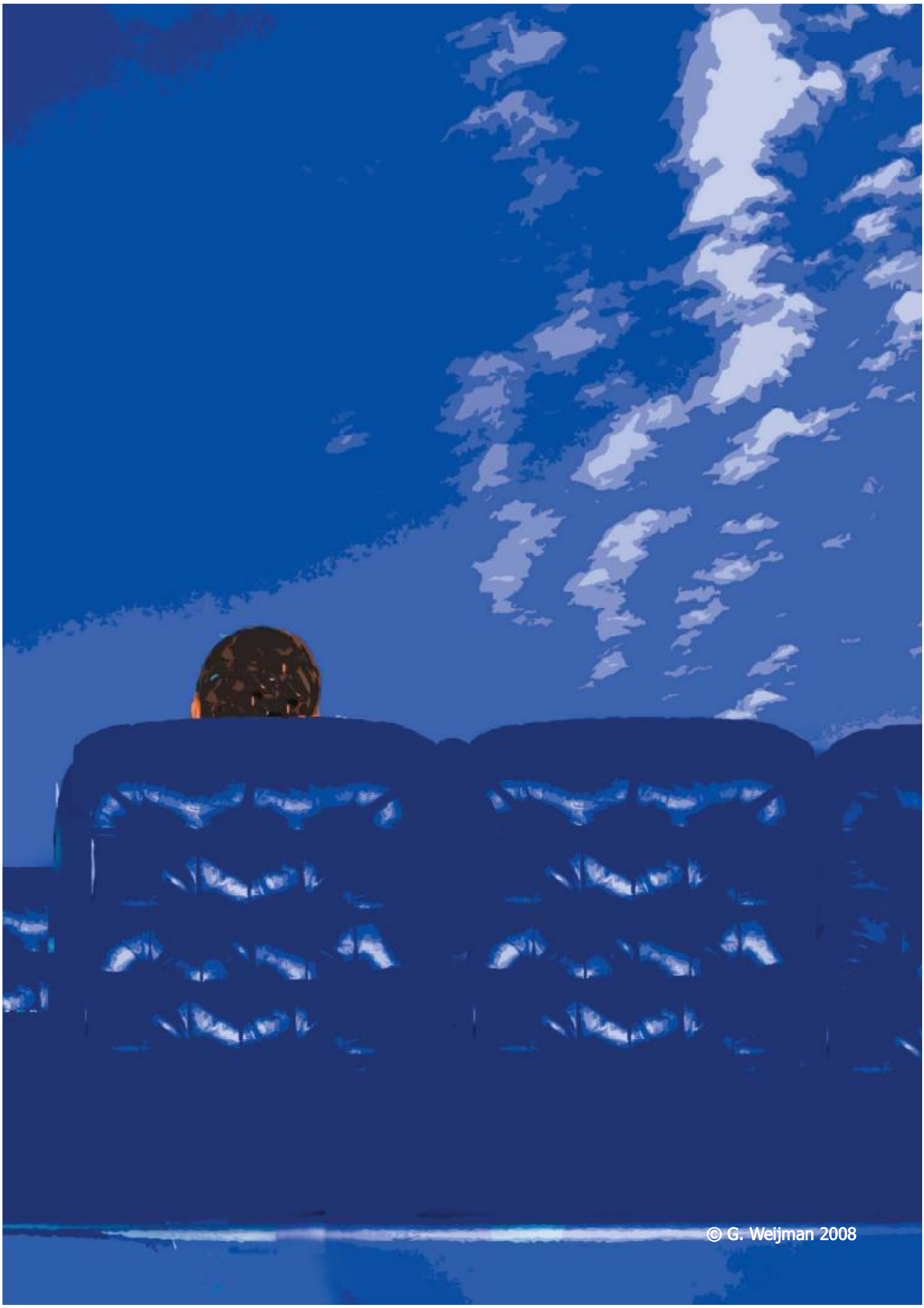
Company E

Personal Loan: He used it but they didn't really need it. They just used it because it was a nice deal. Business mentor: He did use the business mentor but was not very happy about it. He had some bad experiences with his mentor who had a kind of double agenda. That is why he has the opinion that a business mentor should not be assigned so easily. The support he got from his mentor were mainly suggestions about who to do things. They thus in a way gave him some knowledge about how to work and thus had little influence on the cultural capital. Scientific mentor: They made use of two scientific mentors, one at their own department (WB) and one at the department of Informatics. These mentor mainly offered them expertise about certain things. In a way they also helped them establish contacts because they could refer to their mentors when contacting new people. Top commission meetings/Program leader: For Company E the meetings with the TOP commission were not that important. According to the founder in his opinion the intentions were good but it was not all that usefull. This could have a relation with the fact that the founder doesn't like business plans etcetera. In his opinion being an entrepreneur is more about discovering opportunities and making use of them. The meetings with the Top commission are mainly about the business plan and the progress made in terms of that plan thus its quite logical that they were seen as less usefull for Company E. Office space: They had their own office. Secretarial support: They didn't use this. Laboratory facilities: They didn't need this. Course "Becoming an Entrepreneur": This was no part of their TOP program. Network University of Twente: They were PhD themselves and it therefore is difficult to distinguish this network from their own network. But off course it had some impact on their social capital. "Netwerkmeetings": No use.Name University of Twente: They didn't use it intentionally but off course it can help a bit when establishing contacts.
Technology Circle/Kring Twente year membership: No use. Support with writing a business plan: No use.

Company A

The loan was the most important reason for Company A to enter into TOP. This gave them the opportunity to buy the company, it mainly influenced their economic capital.
With his business mentor the founder had a good relationship. Despite of this good relationship he didn't use the business mentor extensively. Partly because his mentor was very busy, partly because he already had some experience. This made that he already acquired other people to fill in the role of mentor. This made that the infliuence of the mentor was limited.
The founder still has contact with his scientifc mentor. Logical because he already knew him before entering TOP as a result of the time that the company was part of the faculty GW. His scientific mentor was very important, he also fulfilled the role of business mentor. He had influence on the strategic capital of Company A because he helped the founder to develop his vision on the company. Besides this he also brought him into contact with students and other networks which increased the network capital of the company. Furthermore, he had influence on the cultural capital of the company by delivering knowledge. The meetings with the TOP commission in the opinion of the founder were very usefull. They helped him to think better about his decisions and in this way influenced the strategic capital of the company. Furthermore, they indirectly influenced his network capital by referring to him.
Thanks to the conditions of the buy-out he already had an office at the faculty of GW.
He didn't use the secretary.
He also didn't use labroratory facilities.
The courses were interesting and gave him some knowledge. The network of the university has delivered many inspiring contacts, mainly via the contacts he already had at the faculty of GW such as his scientific mentor.
"Netwerkmeetings": No use.Name University of Twente: They didn't use it intentionally but off course it can help a bit when establishing contacts and of course he already had some contacts thanks to his contacts at the faculty.
Technology Circle/Kring Twente year membership: No use. Support with writing a business plan: Although a business plan already existed, the format given was handy.

Remarks: The founder hopes that TOP will be improved with better facilities and stricter entering criteria. Access to venture capitalist would also be interesting.


© G. Weijman 2008