IASP International Association of Science Parks and Areas of Innovation

33rd IASP World Conference on
Science Parks and Areas os Innovation 2016

Russia, Moscow

Science parks – recruitment and development of talents

Plenary session

Global talent: the coveted treasure

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Executive Summary

Over the years, Science Parks have been developing and improving their processes in order to offer better support to their tenants and to promote the growth of the region in which they are placed. Since that the regional growth is closely related groups of talented people, Science Parks perform several activities at company level or individual level to attract and recruit talents, according to the characteristics of talent, which is in line with Richard Florida and his thoughts about the "Creative class". We are interested to understand in which way the talent can be attracted or recruited; and discover the stakeholders, their relationships and their motivations. These results are relevant to point out the policy implications of such activities for Science Park management. We gathered information from previous studies on regional perspective and science park development as well as from the literature related to talent concepts. We took advantage of the fact that one of the authors is former CEO of Mjärdevi Science Park and had been an active observer throughout the study period. Also an interview with the CEO of LEAD incubator was held. The results highlighted the importance of being close to the student community; the need to be connected to an international network, with a well-recognized brand; and also the role of the Internet and social media as powerful tools

Introduction

Since science parks were first established in North America in the mid-20th century, the research and market aspects of their profiles, as well as their relationships with knowledge suppliers, innovative firms, and the community, have evolved. In the late 1970s and early 1980s, US policy initiatives – such as the Bayh-Dole Act – have helped create favourable conditions for universities and firm and facilitate partnership formation for commercializing the results of university research (Link and Scott, 2006). This scenario has aided the emergence of new parks in the US, which have been used as models for science park development in other countries (Westhead, 1997).

According to the International Association of Science Parks and Areas of Innovation (IASP), a science park is "an organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions." (IASP, 2016). Furthermore, Westhead (1997) states that science parks express the idea that scientific research leads technological innovation and that parks "can provide the catalytic incubator environment for the transformation of 'pure' research into production" (ibid, p. 46).

Colombo and Delmastro (2002) define a science park as a (ibid, p.1107):

> *… property-based initiative which (i) has formal operational links with centres of knowledge creation, such as universities and (public and/or private) research centres, (ii) is designed to encourage the formation and growth of innovative (generally science-based) businesses, and (iii) has a management function which is actively engaged in the transfer of technology and business skills to 'customer' organizations.*

Several studies, such as the ones of Hommen et al (2006) and Löfsten & Lindelöf (2002), have shown that science parks are strong leaders in supporting and promoting not only the growth of their tenants but also of the surrounding region. Carrying out their leadership role in regional development, science parks make important contributions in several areas; however, the main focus of their operations concerns the management of human capital. Glaeser et al.'s studies (1995) sought to understand why cities grow, and the empirical data that the researchers collected linked regional growth with human capital development. Lucas (1988), too, claims that regional development derives from groups of talented people working in the region. And Florida (2003) states that the existence of talent is a major growth factor and that existing talent is responsible for the continuing flow of new talent into a region. Thus, science parks possess a magnetic-like attraction for this special class of persons, who have the ability to drive the growth of an entire region.

The concept of talent lacks a coherent and consistent definition. What talent is, or even who might be considered talented, are still nebulous concepts. In her 2011 article, Tansley presents several definitions of "talent" which she then applies to talent management, considering various aspects – grammatical, historical, and geographical, for example – in her analysis. Gallardo-Gallardo et al. (2013), attempting a wide definition of talent, suggest splitting the definition into two complementary aspects. The first aspect of talent looks at a class of individuals who are "high performers" or "high potentials". The second aspect considers talent in terms of the special qualities of a person, which can be "innate abilities, acquired skills, knowledge, competencies, and attitudes that cause a person to

achieve outstanding results in a particular context" (ibid, p. 297). In a complementary fashion, Florida (2014) suggests the idea that the work in which the individual has been involved is a valuable source of information about his/her characteristics and the types of skills and knowledge that he/she has. Merging these concepts allows us to build a useful definition of talent that our study can apply.

Previous literature has mainly focused on the roles that science parks play in stimulating regional growth and that talent plays in making it happen successfully. The "science" of innovation and entrepreneurship processes, especially as related to science parks, has been thoroughly researched. But to our knowledge, these studies have only presented a superficial understanding of the links between regional growth, talent, and the processes of science parks related to the attraction and development of such talent. Thus to expand the field in a new direction, one of our theses here is that the success of science parks is directly related to their ability to attract and develop talent. A secondary thesis is that a symbiotic relationship exists between science and talent: one cannot exist without the other.

Undoubtedly, science parks, in their development process, are direct or indirect involved in the attraction and retention of different type of talents. Thus, because few studies have addressed this topic, our study focuses on (i) the activities that science parks undertake to stimulate the attraction and retention of talent, (ii) how and why these activities are being developed, (iii) and the policy implications of such activities for science park management.

Method and data

To address the research questions, we decided to perform a longitudinal case study into the motivations for and activities related to the attraction and development of talent at Mjärdevi Science Park (MSP). MSP was started in 1984. It is located southwest of Stockholm in Linköping, Sweden's 5th largest city. We chose MSP for three main reasons: (i) it has been operating for over 30 years, during which it has seen success and failure, so the data is rich, (ii) the MSP story includes cases dealing with talent recruitment, and (iii) we have good access to data, in part because it is local.

We decided to use a case studies approach because it is, in general, the most suitable method for investigating "a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin 2003, p.18). Moreover, Eisenhardt and Graebner (2007) point out the relevance of case study methodology in building theories, and claim that this method is one of the best "of the bridges from rich qualitative evidence to mainstream deductive research" (ibid, p.25). As the Introduction explained, science parks are less successful without talent, but the existing literature only seems to address the subject of science parks and talent resource management as an afterthought. We decided to explore this research gap because it is crucial that science park managers and tenants understand how talent can be attracted and developed in order to improve science park policies and the chances of achieving success.

We based this study on previous studies that have taken a regional perspective and included science parks as one of the acting agents (Albahari et al., 2011; Löfsten & Lindelöf, 2002; Etzkowitz & Klofsten, 2005; Klofsten et al., 1999) and on studies that have explored science park development

(Hommen et al., 2006; Wessner, 2009). We also made an extensive literature review of talent concepts, with the aim of understanding (i) who is a talent resource and (ii) what qualities or competences (skills and knowledge) an individual must have to be considered a talented person. After that, we began exploring the relationships between talent and science parks in order to determine which main stakeholders were involved in the attraction and development processes of talent (Florida, 1999,2003,2014; Gabe et al., 2012; Gagné, 2004, 2010; Gallardo-Gallardo et al., 2013; Mellander & Florida, 2011; Tansley, 2011).

We took advantage of the fact that one of the co-authors is a former CEO of MSP; he had been an active observer and was able to describe the development of the park from before its founding in 1984 until recently. We also conducted interviews with the CEO of the LEAD business incubator to discover possible missing information on its attraction processes of talent for its tenants. Secondary data were collected by gathering information from associated scientific papers, as listed above; from institutional documentation such as web pages, press conferences); and from a master thesis (Denisova & Goylo, 2012). Finally, key people who had had an active role in the development of MSP validated the case. Finally, three key people who had had an active role in the development of MSP validated the case. These people have directly or indirectly at least 10 years of working experience with MSP's business and development activities, stakeholder relationship management and internationalization.

The collected data were subdivided into four periods of time; namely, Inception, Start-up and Early Development, Expansion and Development, and Continuous Growth and Development. For each period, we highlighted what was expected to be achieved (goals) who was involved and what and how relationships were created among the stakeholders (structures and processes); and what activities MSP actively conducted (MSP-managed activities). Table 1 illustrates this.

We have extracted four talent-cases – talent attraction and recruitment cases – from the Mjärdevi Science Park case. Each talent recruitment case illustrates a different aspect of the issue:

- Mjärdevi Science Park Inc. coordinates the relationship with the faculty of the University.
- The Shadow Boards are a vehicle for maximizing benefits derived from a relationship between the Park and university students.
- Soft Landing targeted international firm recruitment, before later passing its activities on to another department.
- The LEAD business incubator recruit leaders and managers for start-ups.

In-depth data analysis of each time period allowed us to group the concepts and organize them into patterns of activities related to the attraction or development of talent (cf. Gioia et al., 2013). Longitudinal analysis according to the research questions identified patterns in science park activities that were related to talent recruitment.

The Case of Mjärdevi Science Park

Mjärdevi Science Park (MSP) – located southwest of Stockholm in Linköping, Sweden's 5th largest city – was started in 1984. During its 30-plus years of activity, MSP has become an increasingly important actor in the region's economy. The Park sits on a 70-hectare parcel of land adjacent to Linköping University and is home to more than 300 technology-based firms, providing employment for around 6,000 persons. The majority of these firms are small, but larger tenants, such as Arris, Autoliv, Ericsson, Flextronics, IFS and Sectra, also reside in the Park. MSP firms together form an agglomerate of numerous competence areas, including visualization, modelling and simulation, connectivity and mobile broadband, and vehicle safety as well as security systems. The Park offers tenants access to business advice, funding, and internationalisation opportunities, all the while maintaining a focus on the attraction of talent; the Park's broad base of support and activities aim to encourage and stimulate growth and success among its businesses, regardless of size or development stage.

The development of MSP

To explore why and how talent attraction activities are created and developed, we drew up a model of MSP's development and growth, as described in the methods section of this paper (Table 1). The four talent-cases are highlighted in the timeline of MSP's development. The talent-cases exemplify in various ways how MSP organizes activities that target recruitment and retention of talent with the Park.

Table 1- The development of Mjärdevi Science Park

	Inception - 1983	Start-up and early development 1984 - 1993	Expansion and development 1994 - 2000	Continuous growth and development 2001 - present
Goals	– Develop a new "economic base" for the region with a focus on the knowledge economy.	– Open up a geographical area adjacent to the Linköping University campus aimed at building a new science park. – Create a critical mass of new firms and attract a strong anchor tenants. – Create a strong international brand for the science park.	– Increase the domain of MSP to become an internationally recognized player. – Develop more efficient services (including hard and soft resources) for the tenants to better match their real needs.	– Establish closer contacts with University students. – Expand the domain of Science Park with a strong focus on function.
Structures and processes	– Founds informal triple-helix–like collaboration between actors such as the university, the municipality, and firms. – Identifies key stakeholders. – Establishes collaboration. – Utilizes academic resources emerging in the University and surrounding environment.	– Faces and manages collaborative challenges between key stakeholders. – Conducts discussions on the general strategy of the science park: for example, on branding; which firms to target; and management of the park, talent, and other resources. – Creates a package of various services, provided either by the science park itself or in collaboration with external actors offering complementary resources. – Encounters its first crisis (1989-1992): a property stakeholder crisis; as a result, new property developers enter the science park.	– Takes an active role in regional development; Site Selection magazine ranks MSP as the ninth fastest growing park in the world. – As a first step toward a regional innovation system, takes part in the development of the Growlink network, which gives entrepreneurs easier access to resources. – Venture capital companies were placed at the Park, e.g. Novare Capital. – Offers to the University an office for collaboration and commercialization of research at the Park. – Establishes a childcare centre with English speaking personal.	– Becomes home to the LEAD incubator, a merger of the Mjärdevi Business Incubator and the Norrköping Incubator from Norrköping Science Park. – Becomes home to the Innovation Office, newly created by the University. – Faces its second crisis (2001-2003): the IT crisis; major firms downsize or move out, leaving unused space in the Park. – Sees the rise of new opportunities due to the crisis: new firms, new collaborations, and new technological clusters.
MSP-managed activities	– Establishment of an incubator, Technology Village (TV), in the centre of Linköping to support university spin-offs. TV offered simple services to its tenants and was the first step in the development of what would become the Mjärdevi Science Park.	– Relocation of some TV firms to the new science park – Mjärdevi Science Park (MSP). – Establishment of a city-owned organization at MSP for managing Park operations. – Collaboration between MSP and Linköping to create an informal incubator based on the University's entrepreneurship programme (ENP).	– Establishment of Mjärdevi Business Incubator. – Active participation in the International Association Science Park, which MSP used to build a sister park network. – Implementation of a wide area network within the Park. – Establishment of the HomeCom Linköping project.	– Cooperation between MSP and University students on match making for career development. – Launch of the Soft Landing programme to bring international companies to MSP and help established firms reach new markets. – Start-up of creActive, a meeting place and activity arena primarily for students and firms, but also others. – Start-up of a Shadow Board for accessing students' visions on the development of the Science Park. – Participation by MSP in activities development for a new park in Linköping.

Inception – the drive to build a new science park

A proposed cut in government subsidies at the end of the 1970s threatened the future of SAAB, raising the possibility of serious economic problems in Linköping. The Swedish aerospace and defence company was one of the largest employers in the region. In response to the economic climate, Linköping Municipality, Linköping University, and SAAB management came together as key stakeholders and held a series of meetings to discuss ways of ensuring continuity in regional development.

This period was a time when major universities in the US and Europe were becoming increasingly proactive in the development of their regions. Together with regional management, universities were encouraging spin-off firms to exploit the new technology emerging from university research. To support this, regional governments were starting up incubators and science parks. In line with these thoughts, Linköping Municipality established Technology Village in the centrally located Valla industrial area. The incubator offered its tenants only simple administrative services and facilities, but it was undoubtedly an important precursor to the construction of Mjärdevi Science Park.

Start-up and early development – the founding of MSP

Technology Village was growing fast, but it soon became clear that more specific operational support, as well as consultants and financial resources, were needed. The shortage of persons with the specific skills necessary for supporting the development of spin-off firms made it important to find ways of attracting such professionals. Moreover, the many students completing their studies each year meant that if the region could not provide attractive employment, valuable knowledge would be leaving in an annual "drain". For these reasons, the idea of building a science park to improve regional attractiveness became imperative. A science park would gather local talent and attract the outside skills that could support regional development.

In 1984, Mjärdevi Science Park (MSP) formally opened its doors in an area adjacent to the University, at a distance of 5 kilometres from the centre of the Municipality. To offer better support and higher integration with the University, some of the Technology Village firms were relocated to MSP and an informal network, Small Business Development in Linköping (SMIL), was founded. SMIL is composed primarily of entrepreneurs and supports local firms in the conversion of their ideas into successful, feasible businesses. By the end of 1984, Mjärdevi had six firms with 150 employees on site. In addition to small firms and spin-offs, MSP became interesting to larger companies like Ericsson and Nokia, who established the Ericsson Application Centre at the Park in 1987 and Nokia Data in 1989. Companies of this size and importance are essential for attracting other firms, skilled professionals, and financial resources.

In the early 1990s, Sweden suffered a minor recession that included a financial and property crisis. So to fill empty space, Mjärdevi landowners allowed any firm to rent their property, regardless of their operational focus. Because of the potential effects of this decision on MSP growth, the key stakeholders held meetings to reach a consensus on the type of business profile required at MSP. It became more clear which tenants should be attracted to the MSP. When MSP reached 49 firm and 1000 employees,

the Park launched a new limited company responsible for management, development, and marketing: Mjärdevi Science Park AB.

Expansion and development – a solid foundation for growth

In 1994, the University launched the Centre of Innovation and Entrepreneurship (CIE) with the mandate to explore and carry out integration of entrepreneurial activities into research and education activities. One of the first programmes launched was the Entrepreneur and New Business Development Program (ENP). MSP and Linköping University created a new "informal" incubator based on this entrepreneurship programme, which later became Mjärdevi Business Incubator. With solid growth year after year, MSP had become well established: its international network was growing, and the number of new start-ups and firm, and employees continued to increase. The first group of start-ups concluded the pre-incubation program in 1996, and MSP had 110 firms, with around 3000 employees.

MSP had become an important regional performer and actively participated in drawing up an organizational description that defined the roles and activities of the key stakeholders. To improve the offering of services and optimize resource use, MSP and its stakeholders took part in the development of a regional network, Growlink. Network members help other members access adequate funding, and provide advice and guidance in all phases of business development. As a result, entrepreneurs could more easily gain access to regional resources.

At the 15th anniversary of MSP in 1999, the University launched the SMIL Entrepreneurship School (SMILES), which offered five theoretical and practical courses in technology- and knowledge-based entrepreneurship. MSP also became very active in the International Association of Science Parks and Areas of Innovation and used the Association's network to construct a sister park network. The expansion years of MSP also included welcoming venture capital companies to the Park; a childcare centre with English speaking personal; and a University office for collaboration and commercialization of research. Infrastructure kept pace with Park growth through implementation of a wide area network. HomeCom Linköping was established to support the research and development of products that simplify daily tasks for private individuals; this project was so successful that MSP was selected to speak on behalf of the region about its Centre of Excellence in Home Communications technology. Mjärdevi Business Incubator was officially launched in this period, and for the first time, an incubator had all the features and facilities necessary for hosting newly started technology-based firms. By the turn of the century, MSP had 150 firm and 5500 employees, and was still growing.

Continuous growth and development – expanding into the future

The recession in the early years of 2000 severely damaged the IT industry, and affected small businesses as well. During 2000 and 2001, the number of MSP employees declined for the first time, and Park development underwent a downturn. As an example, Ericsson shed over 1600 employees and Nokia Home Communication, close to 200 employees. Despite the crisis, Sectra and Kreatel, two University spin-offs, relocated to a newly constructed building, and Intentia, with its 250 employees,

moved into the former Nokia building. The number of new firms moving into MSP was twice the number of firm leaving. Furthermore, former employees of Nokia created several new firms, transforming what could have been a catastrophe into new opportunities.

While the crisis continued to rage, it became clear that establishing solid strategies to support the continuous growth of the park would be even more critical. Research areas had to be re-evaluated and new ones developed. A work group – comprising 60 firms (including SAAB), the Östergötland County Administration Board, Östsam, trade unions, Linköping University, and R&D organizations – collaborated on the preparation of an application to the Swedish Agency for Innovation Systems (VINNOVA). That organisation subsequently approved the plan, "New tools for life", which sponsored new research in life science technologies. The research lines at the University thus had to be restructured and aligned with this new orientation. The University also created an Innovation Office to handle issues related to the commercialization of intellectual property.

The necessity of attracting new, important firm was still vital for achieving consistent growth, so in 2005, the board of MSP decided to implement Soft Landing, a service for supporting firm wishing to enter MSP. Two years later, support processes for new firm were further improved when the Mjärdevi Business Incubator and Norrköping Incubator were combined into a single new incubator – LEAD. On its 25th anniversary in 2009, after four years of solid expansion, MSP affirmed its self-sustained growth. MSP continued to invest in its firms and talents, providing any required support and integrating them into MSP processes; for instance, with the establishment of a shadow board of directors in 2011, MSP became one of the first Science Parks to have a group of college students participating in its decisions.

creActive, a meeting place and activity arena, opened in 2013 to offer premises for use primarily by students and firms, but also others. Rooms and all infrastructures are free of charge but it is also possible to reserve a room for a voluntary donation. Start-ups find this arena very useful because they can access local infrastructure within an inspiring environment while still being able to establish contact with students and other firms. After 32 years, MSP had around 300 firms and more than 6,000 employees.

Talent case 1: MSP Office Inc.

From the time the Mjärdevi area "opened" in 1984, various actors handled issues concerning establishment, networking, and development. The Technology Transfer Office (TTO) at Linköping University and the Office for Trade and Industry in Linköping Municipality were the main actors who, alone or together, would take responsibility. This way of working, however, created an ambiguity toward both the tenants and other actors. The lack of clarity gradually led to the formation of MSP Inc. in 1993. Linköping Municipality has always been its sole owner, but the board of MSP Inc. has been composed of members from trade and industry, the University, and the Municipality. From the beginning, the company's task has been to coordinate activities that generate growth, support new businesses, strengthen branding, and attract entrepreneurial talent and positions. By building a large net of contacts – regional, national, and international actors – MSP has placed itself on the international map, a factor that has

contributed to attract not only new firms (including international ones) but also new persons to the area. MSP firms have gained access to other markets, and foreign companies have slipped easily into the Swedish system.

The demand for engineers has grown steadily throughout, and when a shortage became the greatest single hinder to growth, focus shifted increasingly to Linköping University students. The need to create better, more precise methods of communication became more and more clear, which, in one sense, the rapid development in social media has alleviated. Hiring staff to work more or less solely with social media has long since been a given, including at MSP. In this way, social media have made the task of describing the exciting firm and jobs linked with the Park vastly easier and contributed strongly to its attractiveness. Other contributors to expanding communication have been the increasingly open attitudes appearing in trade and industry, with investments in Open Innovation platforms, Hackathons, and many others. The increasingly rapid digitalization is also a strong factor in the global increase in attraction. Born Global thinkers make it easy for a country that is small population-wise, like Sweden, to support firm that need to quickly reach the rest of the world. The growing number of newly started firm that are attracting attention and being "captured", or bought up, by multinational players with headquarters in Silicon Valley (or somewhere else) are examples of the efficiency of present communication channels. Such drains, however, do not need to be negative, since they contribute to placing MSP on even more maps, which leads to even more firm (and engineers!) becoming interested in MSP.

Talent case 2 – Soft Landing

For many years, operations dedicated to newly started Swedish firms have been channelled through the incubator. The incubator offering has mainly targeted entrepreneurs who were already in the Linköping region – and often entrepreneurs with a link to Linköping University and surrounding institutions – but also those who choose to leave their employment to start up something of their own. In a proactive attempt to attract more international companies to the Park, thereby strengthening its diversity, the Park initiated a trial operation under the name Soft Landing in 2004. From the beginning, the programme welcomed smaller foreign companies that wished to test the Swedish and Scandinavian markets with an establishment at MSP. After a few years, the programme grew and added support for smaller MSP firms that wished to try new markets. This occurred through venues such as the EU project where Sweden (MSP), Finland (Aalto University), Estonia (Tallinn Science Park Technopol), and Latvia (Latvian Technological Centre) participated.

The MSP project Soft Landing received national recognition as a new means of attracting foreign companies; interest was clearly exhibited when several IT consulting firm, primarily from India but also Germany and Finland, tested the model. Companies that are exclusively R&D, such as medical technology companies from the US, have also chosen to establish themselves at MSP through the Soft Landing programme. What was the offer like? For foreign companies that wanted to test the Swedish market, the offer included premises for one year at a reduced rate, consultations in business law and accounting that were free of charge, HR services at a reduced cost, access to the normal MSP network, and opportunities to make contacts at all MSP events. For those MSP firms that wished to take ad-

vantage of the Soft Landing programme in order to enter new markets, participation in MSP-like environments in other countries was offered, including help with market analyses and access to interesting firms. With the start of the Soft Landing programme, a structured effort in Intercultural Communication was begun, that is, information on the ways business cultures differ in various countries, how one should present oneself, and what is important to think about if and when it is time to do business and establish a firm on foreign markets. This information structure was established with the help of Linköping University and with what today is Business Sweden, a national organization that works to support Swedish export.

One of the consequences of Soft Landing was that MSP became widely known for its international efforts, which attracted persons who wished to work with, and who had knowledge of, internationalization. And not only to the firms in the programme, but to business in general. Simply, it was becoming common knowledge that the MSP firms were basically international in character, and it became easier to recruit staff with special competence in internationalization. After 5–6 years, although the Soft Landing programme was packed away in moth balls, foreign companies were still offered start-up assistance. Information and education concerning new markets has also continued at an undiminished pace.

Talent case 3 – LEAD Incubator

During its development, MSP's mandate to produce sustainable firm has meant that it has involved itself either directly or indirectly with incubators. The first step was to build an informal incubator in 1993. The idea for this came about when young entrepreneurs who had participated in the entrepreneurship programme at the University required premises. This first incubator attempt was successful, and Mjärdevi Business incubator, which later became part of the LEAD Incubator that is now owned by Linköping University, was formed. LEAD is located at MSP, but the incubator has also outsourced some of its activities to Norrköping Science Park, adjacent to the University's Norrköping campus.

An increasingly important and natural part of LEAD's activities has been to assist its tenants to recruit leaders and other strategic personnel. Firms often have a great need to supplement their staff with new employees, and important positions such as a new CEO, board representatives, and staff with skills unique to the sector may need to be filled. Many of the firms admitted to the incubator are started by entrepreneurs with scant experience of developing and leading a firm. The recruitment process has continued to develop, and is now an organized process with allocated internal resources. This must, however, occur with great sensitivity, based on a concrete need and in agreement with the firm – especially concerning recruitment of a new leader. During talent recruitment, there is also established collaboration with other organizations in the region who supplement the incubator's own network in order to find regional, national, and in some cases, international talent. The ability to ensure an inflow of good projects to the incubator in the future is strongly linked – in terms of LEAD – with the ability to recruit talent.

Talent case 4 – The Shadow Board

It is no news that many Linköping University graduates leave the Linköping region. It has been that way for a long time, and many universities outside of metropolises experience the same phenomenon. At the same time, this problem presents a great opportunity. Linköping "owns" its students for 4–5 years and has the chance during this time to inform, influence, and convince students to stay in the city and find their future employer or start their own firm right there. Students have long been a subject of interest at MSP. Interest has grown in parallel with the need for technicians and engineers; the shortage of engineers has become perhaps the single greatest hindrance to firm growth.

What, then, can a science park do to help firm in their hunt for manpower? Quite a lot, actually. Naturally, the right channels are needed for distributing information, but much can be done using various projects and activities to interest students in business, and in the life and culture of a science park environment. MSP started one such effort with the goal of using a group of students from different educational disciplines to discover students' desires for their future work places and their future working environment. The MSP board traditionally comprises experienced politicians and representatives from industry and from the university with an average age that is commonly over, rather than under, 50 years. Such an age category does not naturally have a good grip on the thoughts about the future of those who leave today's university. How do we get these thoughts into our daily operations? By starting up a board project that comprises only students. The idea was quickly implemented in 2012, when just such a Shadow board was started for the Park. Eight students from different fields in the University were offered the chance to participate for 1 year in a board project linked to MSP operations. As compensation for their time and effort, they get professional experience in board work.

The Shadow Board deals with the same issues that an ordinary board would, but will often reach a different conclusion. Both boards have the same chairperson, that is, the chairman of the MSP board has the same duties on the Shadow Board. This simplified the flow of information between the two boards, and the boards have a joint strategy meeting each year. Another advantage is that the students spread information on MSP and its work by its involvement in the social media. The advantage to MSP's development is huge. More excellent suggestions are made, and many are also carried out. After the first year, changes were made in the working method. Instead of the board as a whole, only half of the group is replaced every year, in order to maintain continuity of work

In 2014 the project was renamed to Mjärdevi Student Board. Several works have been done in order to get a better gender distribution and broader representation from different programs of the University. Students from campus Norrköping are integrated to get a regional perspective, and students from exchange programme to get more diversity in the group.

With the Shadow Boards, and several other student projects, MSP has become known to Linköping University students in a completely other way than previously. The firms' opportunities to recruit new graduates have also increased. Even if students choose to leave Linköping, they take with them a positive impression of Linköping, MSP, and a great number of fantastic firms.

Analysis and discussion

In the 1st-order analysis, we extracted from each talent-case concepts related to the attraction or retention of talent (c.f. Gioia et al., 2013). We then correlated these concepts with the theory and set up themes for a 2nd-order analysis. Deeper analysis of the discovered themes led to aggregate dimensions of the 2nd order. Lastly, we constructed data structures for analysis (ibid, 2013).

Science parks are organizations that involve many actors, and the quality of the links between the actors is an important factor in the processes of attraction and retention of talent. All MSP tenants work individually according to their interests and talent. MSP management, however, performs an important role in stimulating the attraction and retention of talent; the Park also uses many approaches in planning and carrying out these activities, as witnessed in the four talent cases. To explore the underlying motivations and outcomes of these activities, we began by analysing the role of the University in talent recruitment, because two talent cases were directly linked to the University and its students (MSP Inc. and the Shadow Board). Next, we examined the roles of firms, start-ups, and well-established firms in the other two talent cases (Soft Landing and LEAD). In three cases, MSP management was the main actor, coordinating the activities, but in the 4th case, the LEAD incubator appeared to be chiefly responsible for talent development. To meet the growing demand among tenant firms for new engineers, MSP looked at new ways of attracting prospective students to Linköping University. Park management began taking advantage of the social media to describe emerging opportunities at the Park. Spreading information via such channels was useful for attracting prospective students, but it was also useful for influencing current students to consider remaining at the Park after they graduate.

Communication was one of the most important tools for attracting and retaining talent at the Park. Through its large network of contacts – comprising regional, national, and international actors – MSP's reputation grew internationally. Multinational players began to take notice of the Park and buy up newly started firm. These events drew even more attention to the Park on the international scene, strengthening the MSP brand and consolidating its image as a suitable environment for business development. Open Innovation concepts emerged first in business incubator environments and then in trade and industry. Park tenants found such an environment favourable for sharing knowledge and developing a sustainable network of mutual support. The networks are an important factor in attracting and retaining firms and professionals who wish to work in an open innovation concept environment. Those who left the Park carried these concepts with them.

Following the bursting of the IT bubble, MSP shifted its focus to attracting foreign companies and developed Soft Landing, a programme designed to function on the international scene. For companies wishing to test the Swedish and Scandinavian markets, this programme offered easy access at a low cost compared with traditional means. Additionally, foreign firms received more benefits, such as coaching and access to the MSP network. The new firms brought new people and new ideas from abroad to the Park, effectuating a renewal in local industry. Moreover, because headquarters for these companies could be anywhere in the world, their contribution to the MSP brand was far-reaching, and the Park become known among many businesses and professionals whom it could not otherwise have reached. As the programme grew, its focus became two-pronged, the second prong a reverse of the first; it began supporting the entrance of smaller tenants onto international markets. Tenants now had

the opportunity and support to grow consistently and remain in the Park. Thus, Soft Landing became also an important way of retaining firms and talents. With the success of the Soft Landing programme, most MSP tenants became international in character, which required staff with knowledge of working internationally. This talent had to be recruited. And not only for the Soft Landing programme, but also for the other Park tenants.

Experienced professionals are important for helping young firms reach the next stage in their growth toward becoming viable; over time, the LEAD incubator developed an internal process for assisting its tenants in their recruitment activities. The lack of senior talent in the young firms might be due to business inexperience in newly started firms or to a need to fill a sudden shortage, such as a new CEO or manager, or staff with sector-specific skills. Using its network and establishing new contacts with other regional organizations, LEAD works to find the best solution to the tenant's needs. Besides actively headhunting talent, LEAD has also built an image of growth and a lot of support to its tenants, being considered by those who yearn to start a new business, for example researchers, students or even workers, as the best bridge between planning and success.

Over the years, MSP has shifted its focus from business to talent. The relevance of attracting and retaining talent has only increased in tact with the digitalization of the world, so MSP has evolved its activities accordingly. In this new situation, the University students became an important element to take advantage of due to their potential in firm creation, as employees in established tenant firms, and for creative suggestions that could benefit Park development. Working along these lines, MSP created a Shadow Board comprising students from various university disciplines for the purpose of identifying students' desires for future work places and working environments. Besides representing the visions and desires of students, student board members are also agents for spreading information related to the Park, above all through the social media. Thus, the Park edged closer to its students, learning to know and work toward their real needs as well as communicate with other young people through the board members. Contact with students goes well beyond Park boundaries, reaching students and prospective students in other regions and countries and sparking their interest to study at the University. However, if some students choose to leave the Park despite its proximity to the University, they will take with them a positive view of MSP and strengthen the MSP image.

The case shows that to attract and retain talent, MSP had to manage a large group of stakeholders, such as Linköping Municipality, Linköping University, R&D organizations, the Swedish Agency for Innovation Systems (VINNOVA), the LEAD incubator and its tenants, and established companies. The case also found that changes in the perception of MSP managers concerning talent recruitment were vital; in other words, they found that talent must be recruited individually, rather than at the enterprise level.

To fulfil the promise of activities for attracting and retaining talent, MSP had to first develop processes that could reach both junior and senior resources. The creative mind-set of young talent is important for contributing to firm growth, and to academic activities at the University. Specific activities, such as arena creActive, have served as tools for accessing the potential of young talent. Senior professionals, as well, have much to contribute in experience and knowledge, whether in large companies, in start-ups, or as researchers at the University. Besides MSP management, LEAD plays an important role in attracting this type of talent for its tenants. Second, the diversity of the represented sectors and of

amenities and services, such as arena creActive, the Collegium, and child care with English personnel, were powerful factors influencing the flow of talent – domestic and international – to MSP. Third, MSP took advantage of its extensive network of contacts, and also the Internet through social media, and worked hard to internationalize its brand and disseminate information on their services, structures, and research opportunities for junior and senior talent.

Conclusions

As described earlier, science parks came about to fulfil the need for an environment conducive to emerging technology- and knowledge-intensive firms. Many studies point out that science parks not only offer physical facilities but also network resources for firms such as access to funding and the exchange of knowledge between firms and organisations in the region (Löfsten & Lindelöf, 2002; Arroyo-Vazquez & van der Sijde, 2008). Not least, a pool of well-educated and specialized labour – a critical resource for the growth and development of firms – can be found at science parks (Ferguson & Olofsson, 2004). The focus of this paper touches on this last resource, namely the activities that science parks could carry out to attract and retain talent, how and why just these activities are developed, and the policy aspects that this entails for science park management.

One important conclusion is that science parks – even though not spelled out in their operational strategies – on their own or in cooperation with others, conduct many activities aimed at attracting and retaining various forms of talent. For example, this could directly concern firm-related activities like *(i)* attraction of management and key personnel for young and growing firms, *(ii)* creation of a platform for international firms to establish themselves in the park, and – not least – *(iii)* exchange with Higher Education Institutions. Traditionally, the Institutions have been considered key actors for science parks, among other reasons, because attracting researchers with viable, innovative ideas and technical skills is crucial for park tenants. It is therefore not so strange that park management establishes formal and informal relations with regional universities at an early stage in order to promote a natural exchange of scientific expertise and research results (cf. Deeds et al., 2000). Establishing relations with students at the university – and perhaps even more important, with researchers – has emerged during the Park's development as an essential activity for developing a source of future employees for park tenants. Above all, talent recruitment occurs on the individual level (cf. Florida, 2003) – it is individuals who build a successful environment – not firms as such.

The study showed that later on in their development, science parks succeeded with relatively few resources to create relations with the student community and, in that way, access the thoughts and ideas of young individuals concerning future working life and what is important for attracting students to the firms. As with student activities, activities for attracting talent to fulfil the specific needs of science park firms arose somewhat later in science park development. Collaboration forms and who is involved in talent recruitment activities in science parks varies with time according to the changing requirements of the stakeholders and the outside world in general.

To succeed in the recruitment and retainment of talent, it is not completely irrelevant to point out the importance of creating an attractive environment – a positive image – of the science park regionally,

nationally, and internationally. This aspect of the science park environment – even though it is difficult to describe empirically – shows the importance of finding a "prestigious address" (Westhead & Storey, 1994) and of creating "image effects" (as quoted in Ferguson & Olofsson, 2004, p.5), to gain recognition through "social signalling" (Felsenstein, 1994, p. 107) and "socio-cognitive effects" (cf. Wennberg and Lindqvist, 2010, p. 223). These "soft" factors are thus important for management to consider in the recruitment and retention of talent at science parks.

Theoretical and practical implications

Studies of talent recruitment at science parks must understand that this is a multi-faceted phenomenon. This study was based on four cases at one science park. The focus varied, but it is highly probable that there are even more forms of talent recruitment to discover at science parks. Future studies – to give a few examples – could, in part, target talent recruitment cases that focus on completely different aspects than those in this study. Other case studies of a comparative nature could be made, both on the activity level and on the science park level. Examples of research questions could include these: Does talent recruitment differ between various types of science parks? In what way do science parks collaborate with their stakeholders in talent recruitment? Do science parks collaborate on talent recruitment? How do science parks recruit talent nationally and internationally? Knowledge generated in such case studies would then become the base for a quantitatively oriented study of science parks, both nationally and internationally.

Studies tend to generate several implications that can act as guidance for management and co-workers in the science parks that wish to participate in stimulating positive growth in the park and in the region. The strength of a park's attraction is linked to its critical mass (cf. Laur, 2015; Klofsten et al, 2015). This is especially true when talent must be tempted away from other regions. The offer of an alternative working place must have work that is interesting and challenging in order for a person to "hazard" taking the step to move; that is, there must be critical mass. Especially when talent must be attracted from world metropolises to smaller towns is this important. Naturally, critical mass varies depending on the size of the city and the park and also on the sector and area of competence. Closely linked with this reasoning on critical mass is branding. Talent prioritizes brands that are strong in their respective areas of knowledge and lifestyle. The brands of the city, the park, and the firms will generate a selection of talent, which is why creating a brand together with critical mass is of defining importance.

Knowledge is perishable, and yesterday's knowledge may not be attractive tomorrow. Thus, attracting tomorrow's talent and manpower, for example, university students, should be the aim. In most cases, they are a fairly mobile collective that will gladly travel the world and are challenged by potential employers in their respective areas of competence. Create relations with the student collective in various ways. The world is the market, both for firms in your park and for all who work with talent recruitment. So take advantage of any opportunity to create international networks, contacts, and entryways. In this way, firms are helped in their internationalization, which for most of them is an absolute necessity for growth, and opportunities are created for attracting talent from around the world to help drive the science park forward.

References

Albahari, A., Klofsten, M., & Canto, S. P. (2011). Managing a Science Park: A study of value creation for their tenants. In Proceedings for the Triple Helix IX International Conference, Stanford University.

Arroyo-Vazquez, M., & van der Sijde, P. (2008). Entrepreneurship encouragement and business development support at universities and science parks Proposal for a new conceptualization. Industry and Higher Education, 22(1), 37-48.

Colombo, M. G., & Delmastro, M. (2002). How effective are technology incubators?: Evidence from Italy. Research policy, 31(7), 1103-1122.

Deeds, D. L., DeCarolis, D., & Coombs, J. (2000). Dynamic capabilities and new product development in high technology ventures: An empirical analysis of new biotechnology firms. *Journal of Business venturing*, *15*(3), 211-229.

Denisova, Y., & Goylo, G. (2012). Open innovation in science parks: The influence of geographic proximity and other factors on firms' collaboration.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. Academy of management journal, 50(1), 25.

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

Felsenstein, D. (1994). University-related science parks— 'seedbeds' or 'enclaves' of innovation?. Technovation, 14(2), 93-110.

Ferguson, R., & Olofsson, C. (2004). Science parks and the development of NTBFs—location, survival and growth. The journal of technology transfer, 29(1), 5-17.

Florida, R. (1999). The role of the university: leveraging talent, not technology. Issues in science and technology, 15(4), 67.

Florida, R. (2003). Cities and the creative class. City & Community, 2(1), 3-19.

Florida, R. (2014). The Rise of the Creative Class--Revisited: Revised and Expanded. Basic books.

Gabe, T., Florida, R., & Mellander, C. (2012). The Creative Class and the crisis. Cambridge Journal of Regions, Economy and Society, rss012.

Gagné, F. (2004). Transforming gifts into talents: the DMGT as a developmental theory 1. High ability studies, 15(2), 119-147.

Gagné, F. (2010). Motivation within the DMGT 2.0 framework. High ability studies, 21(2), 81-99.

Gallardo-Gallardo, E., Dries, N., & González-Cruz, T. F. (2013). What is the meaning of 'talent' in the world of work? Human Resource Management Review, 23(4), 290-300.

Glaeser, E. L., Scheinkman, J., & Shleifer, A. (1995). Economic growth in a cross-section of cities. Journal of monetary economics, 36(1), 117-143.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research notes on the Gioia methodology. Organizational Research Methods, 16(1), 15-31.

Hommen, L; Doloreux, D; Larsson, E. Emergence and Growth of Mjärdevi Science Park in Linköping, Sweden1. European Planning Studies. 14, 10, 1331-1361, Nov. 2006. ISSN: 09654313.

IASP, International Association of Science Parks and Areas of Innovation (2016), [ONLINE] Available at: http://www.iasp.ws/knowledge-bites. [Accessed 28th April 16].

Klofsten, M., Jones-Evans, D., & Schärberg, C. (1999). Growing the Linköping technopole—a longitudinal study of triple helix development in Sweden. The Journal of Technology Transfer, 24(2-3), 125-138.

Klofsten, M., Bienkowska, D., Laur, I., & Sölvell, I. (2015). Success factors in cluster initiative management: mapping out the'big five'. Industry and Higher Education, 29(1), 65-77.

Laur, I. (2015). Cluster Initiatives within the European Context: Stimulating Policies for Regional Development Dreams. In Cook, G., Groen, A., & Van Der Sijde, P. (Eds.). New Technology-Based Firms in the New Millennium (pp. 147-170). Emerald Group Publishing Limited.

Link, A. N., & Scott, J. T. (2006). US university research parks. Journal of Productivity Analysis, 25(1-2), 43-55.

Löfsten, H., & Lindelöf, P. (2002). Science Parks and the growth of new technology-based firms—academic-industry links, innovation and markets. Research policy, 31(6), 859-876.

Lucas, R. E. (1988). On the mechanics of economic development. Journal of monetary economics, 22(1), 3-42.

Mellander, C., & Florida, R. (2011). Creativity, talent, and regional wages in Sweden. The Annals of Regional Science, 46(3), 637-660.

Tansley, C. (2011). What do we mean by the term "talent" in talent management? Industrial and commercial training, 43(5), 266-274.

Wennberg, K., & Lindqvist, G. (2010). The effect of clusters on the survival and performance of new firms. Small Business Economics, 34(3), 221-241.

Wessner, C. W. (Ed.). (2009). Understanding Research, Science and Technology Parks: Global Best Practice: Report of a Symposium. National Academies Press.

Westhead, P. (1997). R&D 'inputs' and 'outputs' of technology-based firms located on and off Science Parks. R&D Management, 27(1), 45-62.

Westhead, P., & Storey, D. J. (1994). An assessment of firms located on and off science parks in the United Kingdom. London, UK: HM Stationery Office.

Yin, R.K. (2003). Case study research – Design and methods. Third Edition. Applied Social Research Methods Series, Volume 5. Sage Publications.