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Franziska Eckardt

To cite this article: Franziska Eckardt (2017) The multidimensional role of science parks in attracting international knowledge migrants, Regional Studies, Regional Science, 4:1, 218-226, DOI: 10.1080/21681376.2017.1383181

To link to this article: http://dx.doi.org/10.1080/21681376.2017.1383181

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Published online: 25 Oct 2017.

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The multidimensional role of science parks in attracting international knowledge migrants

Franziska Eckardt

ABSTRACT

There is a tendency to think in primarily economic terms (e.g., economic and financial opportunities) when considering how major science, technology and business spaces, also known as science parks (e.g., Silicon Valley, USA; Science Vale, UK), attract international knowledge migrants (IKMs) from the global knowledge economy. However, other elements that make places attractive for IKMs to achieve desirable standards of living are often not sufficiently addressed in the recent literature. Using a single case study of the Dutch science park Novel-T, this paper investigates how science parks can deliberately be created to attract and retain IKMs using a new multidimensional model for understanding the attractive effects of science parks on human capital. The fieldwork element involved 20 semi-structured face-to-face interviews, which were analyzed using a narrative analysis technique. The results of the case study show that science parks should be understood as multidimensional networks that trigger both a social attraction effect for IKMs as well as regional economic development and growth. The importance of the spatial design of science parks as well as the creation of a highly international atmosphere were found to be two influential factors in attracting IKMs to a particular science park in a peripheral region. Moreover, the results show that the deliberate construction of a science park with four intended operational effects is not a simple and controllable process, since some operational effects (e.g., external recognition) appear to be more controllable than others (e.g., internal social dynamics).

ARTICLE HISTORY

Received 2 June 2016; Accepted 19 September 2017

KEYWORDS

Global knowledge economy; human capital; multidimensional model; spatial design; science parks; peripheral region

JEL CLASSIFICATIONS

R10; R11; F22; F66

INTRODUCTION

The strategic development of cities and city-regions has become an increasingly important focus of regional studies in the context of a knowledge economy in which the attraction of human capital is considered a ‘panacea to specific economic problems’ (Perry & May, 2010, p. 10). This human-capital-centred approach focuses on how places attract international knowledge migrants (IKMs). As human capital is embedded in people, attracting IKMs involves making places attractive,
something that is often articulated in primarily economic terms (e.g., career development and job opportunities; Phan, Siegel, & Wright, 2005). However, other elements that make places attractive for IKMs to achieve their desirable standards of living are not yet fully understood (Forsyth & Crewe, 2010). Given this lacuna, this paper focuses on the following question: How can science parks deliberately be created to function multidimensionally as attractors of and anchors for IKMs?

Using a single case study of the Dutch science park Novel-T, the paper addresses this research question through the following two sub-questions:

• How can a physical space environment of a science park that is attractive for IKMs be deliberately created?

• How do IKMs perceive these efforts and outcomes?

The paper argues that the attractiveness of science parks can only be understood in terms of the multidimensional networks within which science is embedded. For this purpose, a multidimensional model is developed as a conceptual lens to understand properly the attraction effects of science parks on human capital.

A MULTIDIMENSIONAL PERSPECTIVE ON SCIENCE PARKS

Phan et al. (2005) define science parks as ‘property-based organisations with identifiable administrative centres focused on the mission of business acceleration through knowledge agglomeration and resource sharing upon the basis of the unique knowledge that they produce’ (p. 166). Benneworth and Hospers (2007) argue that the ‘unique, territorial nature of the knowledge produced’ helps to upgrade a science park’s status within particular ‘global production networks’ and thereby attract IKMs to the local knowledge base (p. 779, p. 781). Moreover, they highlight the role of science parks as ‘regional innovation systems’ that support mutual knowledge flows between regions and global markets, thereby ‘refilling the local knowledge pool, creating beneficial spill-overs for local firms’ that attract outside investors as well as IKMs (p. 781). This highlights how the functional knowledge base is constructed in these wider networks within which key science park actors typically operate, such as universities and public research organizations (Vedovello, 1997).

Gallent, Andersson, and Bianconi (2006) note that science park creators and managers often seek to attract and retain IKMs by designing attractive spaces that encourage interaction. Baum, Yigitcanlar, Horton, Velibeyoglu, and Gleeson (2007) highlight that an ideal local environment of a science park for IKMs resembles ‘a [network] space of many places – a stimulating, disjunctive environment that both echoes the multiplicity of contemporary knowledge production while, in its physical quality, compensating for the abstract nature of such work’ (p. 66). Its physical quality or a ‘place identity’ might arise by providing a specific attractive landscaped campus (Gallent et al., p. 40). Van Herzele and Wiedemann (2003) emphasize the importance of accessible and attractive green spaces, whilst Vedovello (1997) notes that spaces simultaneously providing infrastructures for living, learning and leisure increase residents’ quality of life.

To understand the multidimensional role of science parks in attracting and facilitating IKMs, Figure 1 sets out a model for the involvement of science parks within wider regional, national and global networks. Based on Benneworth’s and Arbo (2006) model of the global–local university, a science park operates multidimensionally within its external environment to create four specific steps in innovative regional development processes. Firstly, at the regional and national level, policy-makers attempts to create a unique local knowledge base (functional effect) with an attractive physical space environment. Secondly, this local knowledge base creates regional spillovers for
local and regional firms (*regional upgrading effect*). Thirdly, regional spillovers enhance regional innovation, which becomes recognized at the national and global level (*external recognition effect*). Finally, creators attempt to create a place-related driving force that attracts and retains IKMs (*personal attraction effect*).

**BACKGROUND TO THE CASE STUDY AND ITS METHODOLOGY**

Novel-T is a 180-hectare site located in the Dutch Twente region (Figure 2). It developed from the regionally located University of Twente (UT) and the Business and Science Park (BSP). Originally established in 1961, the UT was an attempt by policy-makers to revive the region economically, as it had suffered heavily from the demise of the textile industry during the 1950s. During the 1970s, the UT’s active engagement with regional industry and regional/national policy-makers led to the creation of the science park Novel-T (formerly known as Kennispark Twente) (Figure 3). Nowadays, approximately 8000 people work in Novel-T and more than 700 spin-off firms are rooted in the UT, which is one of the most entrepreneurial universities in Europe (Karnebeek, 2001).
For the purpose of this paper, a narrative analysis technique was chosen, since it provides useful insights into ways in which science park creators and IKMs use narratives to interpret the world around them, thereby transmitting a set of facts about the society, history and culture prevailing in a specific space. Similar to a relational content analysis, the content of the transcribed interviews was analyzed to explore and identify relationships within and between narratives. The fieldwork element involved 20 semi-structured face-to-face interviews, 10 with science park creators and
10 with IKMs, who were approached using a snowball technique. Each interview followed an interview guideline for either science park creators or IKMs. Due to the chosen narrative analysis technique, each interview was tailored to the specific interviewee.

SCIENCE PARK CREATORS’ EFFORTS VERSUS IKMS’ PERCEPTIONS

The following section provides empirical evidence concerning the question how Novel-T operates as a local space to attract IKMs (see Table 1 for an overview).

**Functional effect and regional upgrading effect**

In 1961, the Dutch national government established the UT as a third technical university in the Netherlands between the two cities Hengelo and Enschede on the former country estate Drienerlo. Its aim was to support both the regional and the national economy by increasing the number of highly skilled engineers (creator C₂). To enhance interaction among actors within the university campus, architects divided it into three clearly separated functional areas that provide a mixture of teaching, studying, residential and recreational facilities, combined with open spaces embellished with public art (Figure 4; creator E₁, creator F₁).

During the 1970s, the UT’s creators had the institutional idea to establish an ‘entrepreneurial university’; a university that proactively establishes linkages and contracts with industry as well as city and regional governments (creator C₁, creator C₂). For this purpose, the UT’s creators introduced a so-called TOP scheme in 1984, designed to support innovative entrepreneurs coming from the UT with financial and business development support (creator A₁, creator C₂). Besides, the creators launched a BSP during the 1980s adjacent to the university campus and Enschede city centre, which offered office accommodations for the UT’s spin-off companies and other high-tech businesses (creator C₁, creator C₂). In the early 2000s, the creators formally established the science park Novel-T that integrated the UT with the BSP. To establish a visible university–industry linkage, an integrated science park infrastructure was developed (e.g., shared facilities for academic and corporate purposes) (Figure 5; creator D₂, creator E₁, creator E₂).

The functional campus environment with its different buildings, green areas and artefacts is appreciated by many IKMs as a unique spatial environment with a beautiful aspect and relaxing environment (e.g., IKM A₁, IKM A₂, IKM A₄). One interviewee mentioned that walking around the campus improves her ‘mental balance’, since the campus environment is isolated from urban traffic noise (IKM A₁, p. 1). The UT is perceived by most IKMs as a young and ambitious university, since it has a strong experimental and applied focus in research as well as good established relationships and research collaborations with industry (e.g., IKM A₅, IKM C₂, IKM D₁). An IKM working in the BSP stated that the UT with its research institutes is seen by (international) enterprises as a valuable and unique knowledge producer for enterprises’ research and development (R&D) centres (IKM B₂). However, although IKMs recognize and value the existing relationships between enterprises and the UT with regard to research, Novel-T as such is often seen as a rather ‘vague place’ (IKM A₅, p. 3). A majority of IKMs did not recognize an integrated science park infrastructure. The existence of a BSP is unrecognized by most IKMs working at the UT because of the absence of a clear linkage between the university campus and the companies located in the former BSP (IKM B₂, IKM C₂). One reason mentioned for this physical disconnection is the presence of a boulevard between the two parts of Novel-T (IKM C₂).

**External recognition effect and personal attraction effect**

Initially, the Novel-T project received much external recognition, reflected in subsidies from Dutch companies and national government (creator C₁). However, this picture changed during the first
decade of the 20th century with the rapid increase of science parks at both national and international levels (creator C1). As a reaction, the UT’s creators established a more innovative-driven entrepreneurial profile aiming to combine academic excellence with an entrepreneurial spirit that supports innovative start-ups and existing businesses in Novel-T with knowledge generation at the UT (creator A1). To establish a globally recognized name that attracts more global

Table 1. Empirical evidence.

<table>
<thead>
<tr>
<th>What creators wanted to achieve</th>
<th>Functional effect</th>
<th>Regional upgrading effect</th>
<th>External attraction effect</th>
<th>Personal attraction effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>How knowledge migrants perceived these efforts</td>
<td>Positive points</td>
<td>Beautiful functional campus environment</td>
<td>Experimental and applied research-oriented university culture</td>
<td>Internationally recognized research institutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valuable and unique knowledge producer</td>
<td>Perceived place-related innovative and entrepreneurial profile</td>
<td>Unique funding opportunities</td>
</tr>
<tr>
<td></td>
<td>Negative points</td>
<td>No visible university-industry linkage</td>
<td>Some international knowledge migrants established local connections</td>
<td>No prominent international profile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficulties to establish international contacts</td>
<td>Difficulties to establish international contacts</td>
<td>Inconvenient location (long distance to airport)</td>
</tr>
</tbody>
</table>

Source: Qualitative data collection.

Figure 4. Functional campus environment.
Source: Based on ‘Masterplan Gebiedsontwikkeling’, March 2008 (outdated).
talent and research foreign direct investment (FDI), creators increasingly strove to make new international contacts and partnerships (creator A1). For example, to enhance its position in the global production network further, the Novel-T foundation established an intensive knowledge exchange with managing directors in Silicon Valley, California (creator B1). Since 2008, delegations of representatives of the municipality, Novel-T enterprises, media (Oost NV), the chamber of commerce and the UT have visited Silicon Valley every two years, followed by return revisits from Silicon Valley delegations (creator A1, creator B1). To establish a more attractive and popular Novel-T spatial environment for IKMs, festivals, career-related events and national sport events are occasionally hosted on the UT campus (creator D1). In order to support IKMs in adapting to the new environment, companies in Novel-T refer their international employees to the Expat Center Twente, located in Enschede, which advises and supports IKMs on issues such as formalities, housing, Dutch taxation, insurance and urban amenities (creator G1).

As a small, rather unknown local place, IKMs perceive Novel-T as a space that encourages young entrepreneurship and applied science (e.g., IKM C2, IKM D1). In addition, several funding opportunities make Novel-T as a place also more attractive to IKMs (e.g., IKM C2, IKM D1). Whereas some IKMs working at the UT were attracted by the UT’s research institutes and unique opportunities (IKM A1, IKM A2, IKM A4, IKM C1, IKM D1), others reported that they were unaware of its profile previously and ended up in the Twente region coincidentally or via personal research contacts (IKM A3, IKM A3, IKM B1, IKM B2, IKM C3). Whereas some IKMs perceive Novel-T as a ‘provincial place’ on the periphery of two small rural cities (IKM A1, p. 2), others think of it as a place that reveals its local attraction through actual experience (IKM...
A3, IKM A3, IKM C1). Some IKMs highlighted that over time the spatial campus environment lacked an international, metropolitan and multicultural buzz (IKM A3, IKM A4, IKM C2). All interviewed migrants agreed on the fact that they did not yet perceive Novel-T as a ‘place to be’. It was highlighted by many IKMs that Novel-T should do more to promote itself (e.g., IKM A3, IKM C2). Furthermore, it was stated by a migrant working at the former BSP that the location of Novel-T was insufficient for multinational companies due to its great distance to metropolitan areas and airports (IKM B1).

NOVEL-T’S MULTIDIMENSIONAL ROLE IN ATTRACTING IKMS

Creators partly succeeded in their efforts to create a physical space environment that attracted IKMs (Table 1). Although some IKMs disliked the place-related provincial atmosphere, which lacked an international dimension, many IKMs stated that the beautiful functional campus infrastructure increased their quality of life and personal attraction towards the place. Novel-T creators’ efforts to build a complex social system created for some IKMs a place-related attraction, a sense of belonging to a place-related identity (Gallent et al., 2006). However, although creators aimed to create proximity through an integrated science park infrastructure, knowledge-transfer between both sides of Novel-T was hampered by a physical disconnection (a boulevard). Lack of a visible university–industry link seemed to hold back creators’ efforts in establishing an innovative milieu (Benneworth & Hospers, 2007) where actors can cooperate and exchange information easily due to proximity and face-to-face contact. Creators’ efforts to attract IKMs through interesting research and funding opportunities were most positively perceived by IKMs. With its rather limited name recognition in the global market economy, Novel-T seems to attract IKMs less due to is external recognition (reputation and status) but more due to a wider social network of contacts, relationships and collaboration-research projects.

CONCLUSIONS

Using a single case study of Novel-T, this paper investigated how science parks can deliberately be created to attract and retain IKMs, thereby using a new multidimensional model for understanding the attractive effects of science parks on human capital. As shown, science parks should be understood as multidimensional networks that trigger both a social attraction effect for IKMs as well regional economic development and growth. The Novel-T example highlights the importance of the spatial design for science parks, since the establishment of a distinctive and unique spatial environment can help to create IKMs’ personal attraction towards a science park. This implies that science park creators can deliberately attract IKMs through active local place-making (e.g., a beautiful landscape or unique culture/profile) beyond a purely economic dimension. However, the Novel-T example also shows that the deliberate construction of a science park with four intended operational effects is not a simple and controllable process, since some operational effects of science parks appear to be more controllable than others. For example, whereas creators are often able to direct a science parks’ external recognition effect through their actions, it is more difficult to control the internal social dynamics within a science park (e.g., the creation of an innovative milieu). Regarding a science parks’ personal attraction, the empirical evidence shows that IKMs have a wide range of expectations and demands for a science park to which they are moving, which puts pressure on creators to fulfil all these different expectations and demands through the creation of appealing regional and urban localities that have a more cosmopolitan identity. Finally, the creation of a highly international atmosphere, encouraging local–global interaction and the establishment of wider social collaboration networks, was found to be an influential factor in attracting IKMs to a particular science park in a peripheral region.
The contribution of this case study to the regional science literature is twofold. Firstly, the results show that more attention needs to be paid to the internal, place-related social (non-economic) dimensions of science parks, since science parks also seem to attract IKMs due to intangible assets, e.g. based on their unique, place-related identity. Secondly, if it is a particular atmosphere and cosmopolitanism of a specific place that supports the attraction and facilitation of IKMs towards a peripheral region, researchers and policy-makers need to think more carefully about ways to establish science parks that combine both traditional economic factors (e.g., sufficient transportation routes, career opportunities) and social factors (e.g., lifestyle amenities, nature and diverse cultural offers). For this purpose, future studies should consider social dimensions (including psychological behavioural effects) that explain how and why IKMs are attracted to particular regional localities.

ACKNOWLEDGEMENTS

The author thanks Lee Pugalis for his supportive feedback and guidance during the review process, and all individuals involved for their time which made the fieldwork possible. Any errors or omissions remain the author’s responsibility.

FUNDING

This paper was funded by the Leverhulme Trust, formally under the title ‘Global Science Scapes: Dimensions of Transnationalism Research Network’ (September 2014–February 2017).

REFERENCES


