

Transitioning from an Economic to a Broader Social Impact

A Case Study of a Swedish University

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Abstract

The role of universities in regional development has been intensively debated in both research and practice. The objective of this study was to examine the possible roles of a university in the development of its region over the long term. A case study approach was adopted through the analysis of a rather young university in a provincial region of Sweden. The region is mainly agricultural but has two large cities where industrial and military activities can be found, as well as IT and R&D activities in two Science Parks and the surrounding ecosystems. A review of the literature dealing with entrepreneurial universities and regional development shows that five main models have been proposed to describe the various roles and interactions of universities with their environments: (i) the knowledge factory, (ii) the relational university, (iii) the entrepreneurial university, (iv) the systemic university, and (v) the engaged university. Interviews with key personnel of the university in relation with regional management and regional stakeholders supplement the case. It is argued that the selected case corresponds most closely to the model of a systemic university but also has characteristics of an engaged university. The current case seems to be in transition between these two models, due mainly to external desires for achieving a broader social impact. This case highlights implications for policymakers and university managers in leading a transition process from one university model to another.

Keywords: Entrepreneurial University, Engaged University, Regional Development, Science Park, Sweden.

JEL: I23; O20; O30; R10; R58

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1. Introduction

Many of the universities that have been created in recent years carry expectations of making a positive impact on the regional economy¹ in addition to other, more traditional missions (Nilsson, 2006). In countries such as Sweden or Denmark, laws define the role of higher education institutes, stating that beyond education and research, a third role for universities is to “co-operate with their surrounding communities” (UKÄ, 2017). Policymakers increasingly demand that universities integrate into their regions, so that they have a positive impact on society.

The literature discusses several models of the roles that were, are being, or should be played by the universities in various regions (Guerrero et al., 2016; Gunasekara, 2016; Uyarra, 2010); for example, entrepreneurial universities (Clark, 1998). For the purposes of this study, the model of a university is defined as a set of roles – or missions – practiced by the university as an organization, within itself or in interaction with its economic, social, cultural, geographical, and political environment. A model is thus characterized by mechanisms that define the internal organization of the university as well as spatial arrangements with its environment. These models seem to be intensively examined in the literature, along with the motivations for the choice of tending toward a particular model. However, the process of transitioning from one model to another seems to be less discussed. Exploring how a university can or should rethink and reorganize itself and its interactions with its environment in order to assume new roles seems nevertheless essential to avoid failure in such a change (Cherwitz & Hartelius, 2006). The contribution of this study is to explore the transition from one model to another and to raise questions that policymakers and university managers would like to reflect upon more specifically.

Linköping University (LiU) has previously been evoked in the literature as a major actor in a successful Triple Helix collaboration (Svensson et al., 2012) – the collaboration between academia, the public sector, and the private sector (Etzkowitz & Leydesdorff, 2000). Currently, the case appears to present elements not only of the Systemic university model but also of the Engaged university model (Uyarra, 2010). How the activities and organization of LiU are evolving is examined

¹ This study defines a region as the subnational administrative area where the university is situated.

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using theoretical models from the literature. LiU seems to be in transition between these two models, toward achieving a broader social impact.

This study addresses the problem of how universities can embed themselves in their region to create a larger impact on the regional economy and society. The following questions address this issue: *(i)* How does the literature define the roles of universities? *(ii)* Which of these definitions is applicable to LiU? *(iii)* What disparities exist between the case and the theoretical models in the literature?

The following section presents a brief overview of the literature discussing the roles of universities, with an introduction to the main theoretical models of universities. A description of the methodological approach adopted in this study follows. After that, the case of LiU is analyzed through the described theoretical lenses. The final section discusses how the case and theory differ and argues that the case currently finds itself in a state of transition. This section also contains brief presentations of the cities of Linköping and Norrköping.

2. The Roles of Universities: A Brief Literature Overview

The roles of universities in regional development have been debated in the fields of economy, geography, and innovation for some decades. Enarson (1973), for instance, insisted that universities cannot be managed in the same way as other types of organizations. Over the years, the number of universities has increased, and with that the amount of public investment in education (OECD, 2016). Also, “[...] interests and expectations placed upon universities have shifted from a more indirect contribution to economic development and innovation [...] to a more formal, institutionalized and proactive role” (Uyarra, 2010, p. 1240). Thus, universities have evolved, and nowadays, the links between universities and their region have diverse configurations.

Uyarra (2010) reviewed the literature on the roles of universities. She synthesized the discussions on this subject in different fields into five university models: the “knowledge factory”, the “relational university”, the “entrepreneurial university”, the “systemic university”, and the “engaged university” (Uyarra, 2010, p. 1230). These models are not thought to be mutually exclusive; they are different analytical frameworks which can be applied in an overlapping manner to match a particular

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situation. The models seem to be progressive in the sense that each model shares characteristics with the preceding model(s) but has more characteristics and a higher complexity in its interactions with the environment.

Enarson discusses a model of the university as a “knowledge factory” (1973, p. 897). In this model, the main roles of the university are to teach, to produce research, and to ensure that the research has a “localized impact” (Uyarra, 2010, p.1232), such as through the applied sciences (Youtie & Shapira, 2008). Research contributions are expected to result in scientific and economic outputs for the companies situated near the university geographically (Jaffe et al., 1993). This, in turn, influences new businesses to choose to establish in a university environment (Abramovsky & Simpson, 2011).

Greater collaboration with the private sector gives rise to the Relational university model (Uyarra, 2010). Collaboration becomes bidirectional: an example is when governments pressured universities to foster national competitiveness during the economic crisis in the 1980s. Universities approached industry and suggested an exchange – funding of research for innovative knowledge (Uyarra, 2010). These relations can take many forms (Bonaccorsi & Piccaluga, 1994), but informal contacts are recognized as being the most important channel for linkages between a university and the private sphere (Meyer-Krahmer & Schmoch, 1998).

As these collaborations develop a strategic character, universities reorganize according to the Entrepreneurial university model (Uyarra, 2010). Collaborations still occur, but knowledge spillovers (Audretsch, 2014) become more institutionalized. Uyarra argues that the majority of studies discussing the entrepreneurial university use data from the United States. Since then, Kalar & Antoncic (2015) have studied several European universities. Gibb et al. (2013) discuss the reasons for the necessity of entrepreneurial behaviors in higher education institutions. Fayolle & Redford (2014) also propose a framework that provides inspiration and tools for any university to become entrepreneurial. In their eyes, “universities need to become more entrepreneurial” (Fayolle & Redford, 2014, p. 1). However, there is no single model of entrepreneurial university, to the extent that global “challenges, such as massification, resource availability, and external stakeholder engagement [...] will affect higher education institutions in distinctive ways and lead to different reactions” (Gibb et al., 2013, p.3).

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The Systemic university model (Uyarra, 2010) derives from discussions on policies for regional innovation systems, which universities participate in as “institutional actors” (Uyarra, 2010, p. 1236). Gunasekara defines regional innovation systems by their “four key elements”:

... the spatial agglomeration of firms and other organizations in a bounded geographical space, in a single industry, or in complementary industries; the availability of a stock of proximate capital, particularly, human capital; an associative governance regime; and the development of cultural norms of openness to learning, trust and cooperation between firms (Gunasekara, 2016, p. 139).

In the Systemic university model, collaboration is extended: the public sector joins the private sector and academia in fostering economic development. Such a configuration is called a Triple Helix collaboration (Etzkowitz, 2003, p. 119).

The fifth model described by Uyarra is the Engaged university model (Uyarra, 2010), adding a developmental focus to the actions conducted by the university. The university henceforth has not only an economic impact, but “social, economic, political and civic roles” (Uyarra, 2010, p. 1240) by responding more specifically to the needs of the region, for the public good, in both formal and informal ways (Hartley et al., 2010; Sachs & Clark, 2017). Breznitz & Feldman (2012) rounded out the literature on this model by suggesting a comprehensive list of the missions that engaged universities assume: basic research, teaching, knowledge transfer, policy development, and economic initiatives.

3. Method and Data

Because LiU has been evoked in the literature as a major actor in a successful Triple Helix collaboration (Svensson et al., 2012), and because it is a partner in the European research project RUNIN (“The Role of Universities in Innovation and Regional Development”), it was chosen as the case for this study.

Literature on LiU was found by using the keyword combinations “Linköping University” and “regional development” in databases such as Scopus and Google Scholar. Three additional interviews were made with key personnel to supplement the picture of this University since the latest scientific publication to date was in

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2012. Around 20 additional online resources were also consulted (website pages and institutional reports in particular) to collect information on the current activities of LiU, or information published from regional stakeholders that permit a better grasp of the context of the case. Case data were analyzed using the framework provided by the Uyarra literature review (2010), in particular its synthetic Table 1 (Uyarra, 2010, p. 1230).

4. The Case of Linköping University

LiU was created in the 1960s, first as a branch of Stockholm University, but soon thereafter as an independent university in 1975, making it the sixth public university in Sweden. Today, LiU has around 4,000 employees and 27,000 students, distributed among its four campuses: two in Linköping, one in Norrköping, and one in Stockholm. On the international scene, LiU welcomes about 2,000 students from abroad, has exchange agreements with 500 universities around the world, and is 47th on the 2016 Times Higher Education ranking of the top 150 universities under 50 years old (Linköping University Library, 2016). This study defines the region for LiU as the conurbation of Linköping and Norrköping, as these two municipalities comprise the larger part of the population in Östergötland County (Brinkhoff, 2016). Östergötland County is situated south of Stockholm in southeast Sweden. With around 450,000 inhabitants recorded in 2016 (Statistiska Centralbyrån, 2017), the County represents 4.5% of the Swedish population. The landscape is largely agricultural, although the two main cities – named “twins” by the Östergötland County Administrative Board (Länsstyrelsen Östergötland, 2017) – have attracted important and diverse industrial production throughout history, and in recent years, knowledge-intensive companies. Agriculture, however, remains a dynamic sector in the county and participates in regional innovation. Both Norrköping and Linköping have good transport links, being situated on the railroad between Stockholm and Malmö and hosting two international airports.

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4.1. Linköping: “Where Ideas become reality”

The 2016 census reports a population of around 153,000 for Linköping, which makes it the fifth largest city in Sweden (Linköping municipality, 2017). Early on, the city was an important place for trading and for religious institutions; it was also one of the first districts to establish a gymnasium². Education is thus a distinguishing feature of Linköping, as is research. Besides being chosen to host a branch of Stockholm University in the 1960s, Linköping served in the 1970s as the new location for research institutes such as the Swedish National Road and Transport Research Institute and the Swedish Defence Research Establishment (Klofsten et al., 1999). The area also has a rich military history as a long-term host of garrisons, in particular for the Swedish Air Force; this may be due to its strategic location, at a reasonable distance from the capital and overlooking the Baltic approaches from the east and the south. That might also be one of the reasons why, in the 1940s, Saab AB chose to establish production plants for military aircraft in Linköping (Klofsten et al., 1999). Today, the five biggest employers in Linköping are, in increasing order: the municipality, the region, Saab AB, LiU, and Ericsson (Linköping Municipality, 2017). Hospital employees are employed by the region. So, the administration, the hospital, the university, Saab, and Science Park Mjärdevi (a community of firms, of which Ericsson is a member) are the main entities shaping economic activity in Linköping.

Science Park Mjärdevi was created in 1984, on 150 acres adjacent to LiU that the municipality had reserved for research, industry, and the housing of “firms with close ties to the university” since 1969 (Hommen et al., 2006, p. 1339). Mjärdevi grew so quickly that, in 1993, the municipality created a company to manage it (Etzkowitz & Klofsten, 2005). The Science Park has had its difficulties during economic recessions, but overall, the Park has recorded positive results: it evolved from 6 companies hiring 150 persons in 1984 to 260 companies employing around 6,100 people in 2011 (Cadorin et al., 2017). It hosts spin-offs as well as R&D departments of multi-national companies, such as Ericsson. One could say that

² “a European secondary school that prepares students for the university” (Merriam-Webster Dictionary, 2017).

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Science Park Mjärdevi embodies the Linköping Municipality motto: “Where ideas become reality”.

The Park is near LiU; not only geographically but in terms of collaboration. The various formal and informal relationships between the University and the Science Park include, for instance, the relations of SMIL³ with CIE⁴ and LEAD⁵. The Shadow Board of Directors at Science Park Mjärdevi is another example: comprising LiU students, the Board is essentially an ambassador for the Science Park with the University. The Shadow Board also meets and brainstorms on issues concerning the operations and management of the Science Park, similar to the ordinary Science Park board (Cadorin et al., 2017). Thus, these links appear to deal not only with technology transfer between the University and the Science Park but also with talent attraction.

4.2. Norrköping, Linköping’s twin city

For Norrköping, the 2016 census reports a population of around 135,000, which makes the city the 9th largest in Sweden (Norrköping Municipality, 2016). Norrköping preceded Linköping in becoming an industrial region. Due to its situation on Motala Ström, a river system that drains Lake Vättern into the Baltic Sea, Norrköping became home to first mills in the Middle Ages, then to weapons and textile industries in the 17th century, and in the 19th century, the paper industry. In the 1960s, both Philips and Ericsson chose to locate part of their electronic device production to Norrköping. Ten years later, LiU opened Campus Norrköping, attracting a thousand students (Svensson et al., 2012). The labor market worsened in the 1980s and the early 1990s. Although Whirlpool bought one factory from Philips, the other was closed down, with Ericsson also deciding to relocate (Svensson et al., 2012). In 1997, LiU decided to expand its campus in Norrköping. The expansion was tightly coordinated with the municipality, which held privileged member status on the strategic committee. At that time, the campus had 500 staff

³ SMIL is a Foundation for Small Business Development in Linköping: a club of entrepreneurs from Science Park Mjärdevi.

⁴ CIE is the Centre for Innovation and Entrepreneurship, at LiU. It was set up in 1993.

⁵ LEAD is LiU Entrepreneurship and Development: the incubator, owned by both the university and Science Park Mjärdevi.

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members and 5,000 students. In the 1990s, the public and private sectors in Sweden joined together to create Norrköping Science Park, along with its business incubator.

The expansion of Campus Norrköping occurred at a turning point in the history of Norrköping. Indeed, initiatives from the municipality and local businesses multiplied after the turn of the century to give new energy to the economy and the labor market; but also, in large part, because the regional government realized that the area would lose the talent it was producing if there were no jobs for them after graduation. That would have been to the detriment of regional development considering this talent could mitigate and might be what pulled the region out of the economic downturn of the 1980s and 90s.

So the municipality invested money from the sale of its energy company to create a local foundation for university–industry cooperation for innovation. In addition, two professorships were created: a private local foundation sponsored a professorship in printed electronics and Ericsson, a professorship in communication electronics (Svensson et al., 2012). These moves aimed to foster innovation by improving existing local resources; namely, the know-how in electronics from the Philips-Ericsson era, and the knowledge assimilated, transmitted, and renewed by the University. These efforts paid off: in 2016, the Science Park had 150 companies and 1,000 employees (Norrköping Science Park, 2017). However, the biggest employers remain the administration, the hospital, the university, and two major paper producers (Norrköping municipality, 2016); this illustrates the unique combination of industry and knowledge that constitutes the Norrköping economy.

4.3. Linköping University

The present case was analyzed using Uyarra’s framework in order to verify existing models and discover potential disparities. As a research institution, LiU could primarily be considered a knowledge factory, to the extent that the knowledge it produces has a localized impact. In a study of relations between LiU and SMIL, Klofsten & Jones-Evans (1996) evoke LiU as a provider of human, financial, and intangible resources such as structural knowledge and credibility for SMIL, a club

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of entrepreneurs from Science Park Mjärdevi aiming to develop business skills (Laur et al., 2012).

The University has been previously characterized as “entrepreneurial” (Svensson et al., 2012, p. 1) because of its support of entrepreneurship among its students and its academic staff. Entrepreneurship is indeed integrated in LiU’s curriculum. Among several initiatives dealing with entrepreneurship, such as the creation of an innovation office and a business incubator, the CIE stands out, and with it, the Entrepreneurship and New Business Development Program (Etzkowitz & Klofsten, 2005). Since then, entrepreneurship has been taught to students from all types of educational programs (Linköping University, Communications and Marketing Division, 2016). But entrepreneurship teaching targets not only university students. In 1999, an existing collaboration between LiU and SMIL resulted in SMILES (SMIL Entrepreneurship School), which offers business development and management programs to local entrepreneurs (Etzkowitz & Klofsten, 2005). University researchers are also interested in entrepreneurship: Sectra, a medical technology and encrypted communication systems company, is an example of a business created by university researchers that still collaborates with the University (Sectra, 2017).

The literature on the role of LiU in the development of its region mainly concerns its involvement in a Triple Helix collaboration – a collaboration between academia, the public sector (e.g., municipalities and regional agencies), and the private sector (regional businesses; Etzkowitz & Klofsten, 2005; Svensson et al., 2012). University involvement in a Triple Helix collaboration seems to accord with the concept of a systemic university, as defined by Uyarra (2010). Etzkowitz & Klofsten (2005) clearly identify LiU as a key actor in the knowledge-based development of the region. Svensson et al. (2012) also identify the university as essential to the development of a mixed economy based on both knowledge and industry, as in Norrköping Municipality.

In addition, there are at least two examples of public sector involvement with the university and the private sector to enhance economic development. The first example of public sector involvement embodied by regional organizations occurred in the 1980s when the Regional Development Fund provided state financial support to create the first incubator in Linköping (TeknikByn). The second example is the application by the County to the Vinnväxt competition sponsored

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by VINNOVA (the Swedish Innovation Agency) for research funding in the early 2000s (Etzkowitz & Klofsten, 2005). Also, Norrköping Municipality was a privileged member of the strategic committee of the University in the expansion of Campus Norrköping and was in the same time involved in creating Norrköping Science Park and its business incubator (Svensson et al., 2012). Currently, the University Board comprises representatives from the university (academic staff and students) and from public and private organizations (for instance, Saab AB and Norrköping Art Museum) (Linköping University, 2016a). As the Board is the highest decision-making authority in the university, all groups and individuals who have dealings with the university may present their opinions, and participate in strategic decision-making.

Other elements in the history of LiU and also characteristics of its current activities are indicative of an engaged university. In particular, the university now partners in a Penta Helix – a collaboration model for regional development through innovation that Hansson et al. introduced in 2014. The research team is based at the universities in Malmö and Lund and the Swedish Centre for Social Entrepreneurship (CSES). The team published a report in which they describe the Penta Helix model as a “social innovation ecosystem” (Björk et al., 2014, p.27) that includes not only the public and private sectors and academia, as in the Triple Helix model, but also social entrepreneurs and civil society (Björk et al., 2014). In the Penta Helix, stakeholders are expected to co-produce knowledge in a model that enhances knowledge exchange and fosters social innovation at a more rapid pace, while strengthening the role of civil society in innovation. Thus, the social, rather than the economic, impact is of foremost concern.

As a member of the East Sweden Business Region, an informal network aimed at fostering the growth and development of innovation in regional companies, LiU exhibits another aspect of an engaged university (Interview, 16/05/17). Network members include public organizations, such as the municipality (their business and trade offices); private organizations; and semi-public organizations, such as the Chamber of Commerce. Although it was created in 2016, the East Sweden Business Region has its roots in 1997 under the name GrowLink⁶. In this first phase, LiU created GrowLink in response to the 1992 Swedish Higher Education Act defining

⁶ The name GrowLink comes from “Grow Linköping”.

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the three roles of higher education institutes: research, education, and valorization (i.e., to spread and utilize knowledge). The University chaired GrowLink throughout the major part of its existence. LiU already had many contacts with the private sector in the region. The idea behind GrowLink was to simplify these contacts and create a platform where organizations – in the beginning, regional public organizations involved in innovation, such as the Science Parks, or VINNOVA – could meet to discuss their projects.

The present (2017) objectives of the East Sweden Business Region are the same as they were in GrowLink. Several working groups focus on themes such as Growth, Development, or Talent Attraction. People have a way to find inspiration by learning about innovation being implemented in other regions of Europe: for instance, in 2017, a visit was organized to Food Valley NL in the Netherlands. The Regional Agency and LiU co-chair East Sweden Business Region, which brings political issues into the network and could, according to one interviewee, lower the participation of network members; this occurred when the Regional Agency was sole chair of GrowLink for 3 years in the 2000s: members asked the University to resume the chair in order to reduce the politics. But measurements of the practical outcomes of the present platform show the network to be successful: there is, for example, the partnership between CAM⁷ and ALMI⁸, which arose in the framework of East Sweden Business Region: the CAM–ALMI partnership has supported the growth of around 50 small and medium-sized companies, resulting in 400 new jobs and a regional revenue increase of 40% in 3 years (Interview, 16/05/17).

Another example of the continuity of university involvement in a Penta Helix collaboration for regional development is the case of the HELIX Competence Centre. HELIX is a platform where various regional stakeholders can share their concerns and on-going work on working life issues. In the beginning, the HELIX collaboration was known as the HELIX VINN Excellence Centre, which VINNOVA funded for 10 years. The Excellence Centre was a cross-disciplinary research unit focused on sustainable development in organizations (Elg et al., 2016). The aim was to enable a collaboration between researchers, industrial partners, and public

⁷ CAM is the Centre for Applied Management for small and medium-sized enterprises at LiU.

⁸ ALMI is an organization providing loans, venture capital and advisory services to businesses.

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organizations in the form of a Triple Helix collaboration using an interactive research approach. Interactive research begins with the emergence of research questions in discussions between researchers and HELIX partners. The partners then provide researchers access to data, after which the researchers seek the help of the HELIX partners for testing ideas and validating hypotheses and theories. Extensions in funding made it possible to pursue research projects and broaden partnerships in HELIX Competence Centre, which now include labor market organizations and civil society – that is, it is now a Penta Helix collaboration.

5. The Specificities of Linköping University: In Transition from an Economic to a Broader Social Impact

Today, LiU seems to fit somewhere between the models of the systemic and the engaged university. Indeed, if we consider the list of missions that an engaged university must undertake according to Breznitz & Feldman (2012), LiU does seem to fulfill a number of these missions. For instance, the activities of the LEAD incubator, which the university owns, appears to fulfil the mission of “business assistance” (Breznitz & Feldman, 2012, p. 147). The HELIX Competence Centre and East Sweden Business Regions appear to fulfill the mission of “partnership development” (ibid., p. 151) while the mission of “real estate development” (ibid., p. 153) seems to be included in the present scope of LiU activities, such as with the involvement in the Vallastaden exhibition on urban living (in which LiU is a partner) at the southern end of Campus Valla (Vallastaden, 2017). However, examples of how LiU fulfills the mission of “workforce development” (Breznitz & Feldman, 2012, p. 150) are more difficult to find: although LiU is a teaching organization and one of the largest employers in Östergötland County, most students leave the region after graduation. A quick glance at the online LinkedIn database reveals that among the LiU alumni who have posted a profile, 27% currently work in Linköping, Norrköping, or Östergötland County and 22% in Stockholm and its surroundings (LinkedIn, 2017). As Stockholm itself hosts several higher education institutions, the difference in these rates would be expected to be much larger. Thus it seems to be difficult to retain students within the region: “[...] *make students stay is the challenge of the University*”, as one Innovation Adviser from the LiU Innovation Office states (Interview, 02/05/17).

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At first glance, the case of LiU does not seem to fit any particular model in those proposed by Uyarra (2010). Though she points out that “regional-specific determinants” (Uyarra, 2010, p. 1243) make each university case unique, each case will more or less fit one of her models. Some elements of LiU seem hardly reproducible: for instance, the favorable period in which the University was founded was during a time in Sweden of government investment in higher education and when the labor and accommodation markets were becoming saturated in Stockholm, especially due to the baby boom generation reaching adulthood (Knuthammar & Reksten, 2013). Thus, financial and human resources were available. Needing to develop economically, the city of Linköping took advantage of its geographical location, an easy distance from the Swedish capital, to share in these resources – the University is one result. Other case elements, however, could be considered inspirational and suitable examples for other rural universities wishing to pursue knowledge-based regional development.

5.1. An innovative mind-set

Major themes of interdisciplinary research and education have been Ariadne threads woven throughout the strategy of the University. As early as 1969, at the founding of the university, a Master’s program in Industrial Engineering and Management was being taught (Linköping University, Communications and Marketing Division, 2016). In 1980, five years after LiU achieved accreditation as a university, the Department of Thematic Studies, “Tema” – “a unique academic environment for thematically structured, interdisciplinary and practical societal research” (Linköping University, 2017) – was founded (Etzkowitz & Klofsten, 2005) and became emblematic of this interdisciplinary approach. In 1998, the Environmental Science Program for bachelor and master students was launched. This specific interdisciplinary program was the starting point of the work of Öberg (2009), who was one of the first researcher to reflect on how to assess the quality of interdisciplinary research. Another typical example is the increasing investment in research that occurred in the early 2000s, which brought the Home Communication and Life Sciences Technologies research fields closer; thus, knowledge from IT, electronics, and the life sciences could be combined (Etzkowitz & Klofsten, 2005).

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The innovative practice of problem-based learning (PBL) has triggered excellent academic results from students at the medical school (Klofsten et al., 1999). The learning process is as follows (Linköping University, Communications and Marketing Division, 2016):

In PBL, students face different cases, and have to formulate what they need to know, and search out the knowledge they need. There are no given right or wrong responses, and different sources can contradict each other. The teachers shift from giving answers to asking questions and posing challenges.

Contrary to most other European countries, university employees in Sweden benefit from the “Professor Privilege” (Färnstrand Damsgaard & Thursby, 2012): the law states that ideas belong to their inventors and not to the organization they are working for (CODEX, 2016). This is another motivating factor for innovation. Events such as Tech Tuesdays at Mjärdevi Science Park, where companies from the Science Park publicly present their activities, allow Swedish entrepreneurs and researchers to share their ideas, and discuss the progress of their work with their peers and with professionals in other fields (Science Park Mjärdevi, 2017). This allows them to inspire others and to improve their own work. Combining this ability to share with the multi-disciplinary approaches of the University that include involvement in several networks – local, national and international – seems to show an innovative mind-set that is specific to LiU.

External pressures, however, might be threatening this innovative mind-set (Interview, 16/05/17). For one, nearly the entire generation of entrepreneurs that founded the university has retired, relinquishing their seats to a new, perhaps more risk-averse generation. For another, stronger regulations on Swedish and European levels, and greater effort to measure the impact of all implemented actions are a drag on innovation. These are threats to the LiU model that might dissuade the new generation of academics and university staff from aspiring to a new dynamic in the entrepreneurial spirit of the University (Interview, 16/05/17; Enarson, 1973). Such great efforts as have been made in the field of quality measurement might weaken the focus on innovative approaches that previously contributed to the success of the university, such as the implementation of PBL. As the interviewee states: *“I come from the field of Quality Management, but I think that this [quality measurement] is going too far”* (Interview, 16/05/17).

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5.2. A common objective with regional stakeholders and sense of consensus

From the start, each stakeholder involved in regional development – the municipalities, the region, businesses, and the university – agreed to work for growth and the well-being of society (Interview, 16/05/17). This common objective, along with the peculiarly Swedish trait of consensus in decision-making (Lämsä, 2010), is recognized to have spurred regional development. An added value of the University is that it has no political leanings (Interview, 16/05/17); thus, the University is especially suited for creating and managing networks in the Penta Helix collaboration, as well as receiving government funding.

Other regional collaborations include LiU's involvement in designing the Regional Innovation Strategy, which the LiU Director of Valorization and a Regional Agency representative drew up. LiU, due to its excellent research, was especially suited for participating in implementation of the SMART Specialization Strategy⁹; the University also helped draw up the Regional Development Plan, despite the Plan being a political document (Interview, 16/05/17). LiU strategy aligns well with these strategies; because the same stakeholders are involved, organizations are able to evolve in the same direction. Thus, the region involves the University in its strategic decisions, granting the University a legitimacy to act for regional development.

LiU seems to be in transition from a Systemic to an Engaged university model. One sign of this is the current evolution from involvement in a Triple Helix collaboration toward a Penta Helix collaboration. In addition, the University appears to have taken the lead in the two cases of Penta Helix collaborations discussed previously – East Sweden Business Region and the HELIX Competence Centre. Through its innovative mind-set, LiU has proven its concern for the public good. Starting in the 1970s, University participation in these collaborations was considered a way of engaging in the region through public awareness. However, such social impact is indirect as it occurs only through the classical educative, research, and economic contributions of the Systemic university model. The strategic alignment of the University with regional stakeholders still involves only the public and private

⁹ The SMART Specialization is an approach to regional innovation system that aims at decreasing the development gap that might exist between regions, by focusing on areas of excellence, or specialization fields (Camagni & Campello, 2013).

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sectors. The eight strategic partners of LiU Relation¹⁰ are all Triple Helix members (Interview, 12/09/2017). Citizens and social entrepreneurs, and civil society, have not yet been invited to be part of this alignment. Direct social collaboration and impact seem to be a work in progress for LiU. The PhD course on “Collaboration as a research skill” at LiU shows a real concern and need for reflection on and a clearer definition of the role of collaboration. Moreover, it can be observed in the literature that for some authors, the distinction between entrepreneurial, systemic, and engaged universities seems to be quite small, and sometimes nearly nonexistent. For instance, Gibb et al. (2013) feel that there is

a variety of ways in which higher education institutions behave entrepreneurial, for example [...] create and nurture synergies between teaching, research and their societal engagement. (p.1)

This might help explain the difficulties in transitioning from one model to another.

6. Discussion

The overall objective of this case study of LiU was to examine ways of embedding universities in their regions that would create beneficial impacts on the regional economy and society. The first question of this study was to explore the literature for various relevant definitions of the roles of universities in regional development. Five different models and their characteristics are discussed: the knowledge factory, the relational university, the entrepreneurial university, the systemic university, and the engaged university.

The second question aimed to discover if one or several of these definitions were applicable to LiU. The Systemic university model seems to fit LiU best, while current University efforts indicate movement toward the Engaged university model. Indeed, the involvement of LiU since its creation in a Triple Helix collaboration has anchored it well in the regional innovation system (Gunasekara, 2016). The evolution of this Triple Helix collaboration toward a Penta Helix collaboration with other regional stakeholders such as civil society shows concerns for the social

¹⁰ “LiU Relation is a unit within Linköping University Holding AB with assignments to work with developing collaboration” (Linköping University, 2016b).

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issues of the region that can be interpreted as an emerging orientation toward the Engaged university model. Thus, LiU seems to be in transition between these two university models.

The last question led to a discussion of the disparities between the case of LiU and the five theoretical university models. Two specificities in particular emerged: an innovative mind-set and an early, solid strategic alignment with regional stakeholders. As both involve collaboration with only the public and the private sectors, they seem to convey the idea that making a direct impact on society is an ongoing task.

This study highlights implications for policymakers and university managers in leading a transition process from one university model to another. In particular, the transition implies facing a higher complexity in internal organization and external collaborations in order to meet higher societal expectations. Such a process needs time and resources. Inviting new stakeholders to collaborations is also necessary. To do that, the right human resources must be found, in order to understand the needs of these stakeholders and reach a consensus. Only after these steps have been taken will a university be able to adapt its strategy to account for needs in order to make a direct impact on society.

Finally, it seems that this evolution is being undertaken in response to external expectations or even pressure. What is the real added value for the university when they implement such a change? Is it relevant for the university to meet the expectations of so many stakeholders? Does this detract from its core missions of education and research? Further insights from regional stakeholders and civil society would possibly clarify these questions. The implications of this study also highlight the importance of undertaking comparative longitudinal case studies of European universities with different contexts and histories.

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Transitioning from an Economic to a Broader Social Impact

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7. References

- Abramovsky, L., & Simpson, H. (2011). Geographic proximity and firm–university innovation linkages: evidence from Great Britain. *Journal of economic geography*, 11(6), 949-977.
- Audretsch, D. B. (2014). From the entrepreneurial university to the university for the entrepreneurial society. *The Journal of Technology Transfer*, 39(3), 313-321.
- Björk, F., Hansson, J., Lundborg, D., & Olofsson, L. E. (2014). An Ecosystem for Social Innovation in Sweden: A strategic research and innovation agenda.
- Bonaccorsi, A., & Piccaluga, A. (1994). A theoretical framework for the evaluation of university – industry relationships. *R&D Management*, 24(3), 229–247.
- Breznitz, S. M., & Feldman, M. P. (2012). The engaged university. *The Journal of Technology Transfer*, 37(2), 139-157.
- Brinkhoff T., 2016. *SWEDEN: Östergötland*. Retrieved from: <https://www.citypopulation.de/php/sweden-ostergotland.php>
- Cadorin, E., Johansson, S. G., & Klofsten, M. (2017). Future developments for science parks: Attracting and developing talent. *Industry and Higher Education*, 31(3), 157-167.
- Camagni, R., & Capello, R. (2013). Regional innovation patterns and the EU regional policy reform: Toward smart innovation policies. *Growth and change*, 44(2), 355-389.
- Cherwitz, R. a, & Hartelius, E. J. (2006). Making a " great ' engaged ' university " requires rhetoric. *Fixing the Fragmented University: Decentralization With Direction*, 265–288.
- Clark, B. R. (1998). The entrepreneurial university: Demand and response 1. *Tertiary Education & Management*, 4(1), 5-16.
- CODEX, 2016. *Ownership of research results*. Retrieved from: <http://www.codex.vr.se/en/agande1.shtml>

Transitioning from an Economic to a Broader Social Impact

A Case Study of a Swedish University

- Elg M., Ellström P.-E., Kock H., Tillmar M., 2016. *Impact Evaluation Report: HELIX VINN Excellence Centre Year 2006-2015*. Retrieved from: <https://liu.diva-portal.org/smash/get/diva2:970439/FULLTEXT01.pdf>
- Enarson, H. L. (1976). University or knowledge factory? *Multidisciplinary Readings in Educational Leadership*, 367.
- Etzkowitz, H. (2003). Research groups as "quasi-firms": The invention of the entrepreneurial university. *Research Policy*, 32(1), 109–121.
- Etzkowitz, H., & Klofsten, M. (2005). The Innovating Region: Toward a Theory of Knowledge Based Regional Development. *R&D Management*, 35(3), 243–255.
- Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university – industry – government relations. *Research Policy*, 29, 109–123.
- Fayolle, A., & Redford, D. T. (2014). *Handbook on the entrepreneurial university*. (E. E. P. Ltd, Ed.).
- Färnstrand Damsgaard & Thursby, 2012. *University Entrepreneurship and Professor Privilege*. Retrieved from: http://entreprenorskapsforum.se/wp-content/uploads/2013/03/WP_21.pdf
- Gibb, A. A., Hofer, A. R., & Klofsten, M. (2013). The entrepreneurial higher education institution: a review of the concept and its relevance today.
- Guerrero, M., Urbano, D., Fayolle, A., Klofsten, M., & Mian, S. (2016). Entrepreneurial universities: emerging models in the new social and economic landscape. *Small Business Economics*, 47(3), 551–563.
- Gunasekara, C. (2006). The generative and developmental roles of universities in regional innovation systems. *Science and Public Policy*, 33(2), 137-150.
- Hartley, M., Saltmarsh, J., & Clayton, P. (2010). Is the Civic Engagement Movement Changing Higher Education? *British Journal of Educational Studies*, 58(4), 391–406.
- Hommen, L., Doloreux, D., & Larsson, E. (2006). Emergence and Growth of Mjärdevi Science Park in Linköping, Sweden. *European Planning Studies*, 14 (March 2015), 1331–1361.

Transitioning from an Economic to a Broader Social Impact

A Case Study of a Swedish University

- Jaffe, A. B., Trajtenberg, M., & Henderson, R. (1993). Geographic localization of knowledge spillovers as evidenced by patent citations. *the Quarterly Journal of Economics*, 108(3), 577-598.
- Kalar, B., & Antoncic, B. (2015). The entrepreneurial university, academic activities and technology and knowledge transfer in four European countries. *Technovation*, 36, 1–11.
- Klofsten, M., & Jones-Evans, D. (1996). Stimulation of technology-based small firms - A case study of university-industry cooperation. *Technovation*, 16(4), 187–193.
- 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), 125-138.
- Knuthammar, C., & Reksten, E. H. (2013). *LiU - Ungt universitet på väg*.
- Laur, I., Klofsten, M., & Bienkowska, D. (2012). Catching Regional Development Dreams: A Study of Cluster Initiatives as Intermediaries. *European Planning Studies*, 20(11), 1909–1921.
- LinkedIn, 2017. Linköpings Universitet Alumni. Retrieved from: <https://www.linkedin.com/school/164742/alumni/>
- Linköping University, Communications and Marketing Division, 2016. *Always an innovator*. Retrieved from: http://old.liu.se/insidan/kommunikationsstod/info/startside/1.675008/Fickfakta_LiU_eng_2016_web.pdf
- Linköping University Library, 2016. University ranking lists. Retrieved from: <http://www.bibl.liu.se/bibliometri/rankinglistor?!=en&sc=true>
- Linköping University, 2016a. *University Board*. Retrieved from: <https://liu.se/en/article/university-board>
- Linköping University, 2016b. *LiU Relation*. Retrieved from: <https://liu.se/en/article/liu-relation>
- Linköping University, 2017. *TEMA - Department of Thematic Studies*. Retrieved from: <https://www.tema.liu.se/?l=en>

Transitioning from an Economic to a Broader Social Impact

A Case Study of a Swedish University

- Linköping municipality, 2017. *Facts about Linköping*. Retrieved from: <http://www.linkoping.se/contentassets/374bd965f2414e478857560637700f49/facts-about-linkoping---september-2016.pdf>
- Länsstyrelsen Östergötland County, 2017. *Home Page: County Administrative Board*. Retrieved from: <http://www.lansstyrelsen.se/Ostergotland/En/Pages/default.aspx>
- Lämsä, T. (2010). Leadership Styles and Decision-making in Finnish and Swedish Organizations. *Review of International Comparative Management*, 11(1), 139–149.
- Merriam-Webster Dictionary, 2017. *Gymnasium*. Retrieved from: <https://www.merriam-webster.com/dictionary/gymnasium>
- Meyer-Krahmer, F., & Schmoch, U. (1998). Science-based technologies: university–industry interactions in four fields. *Research Policy*, 27(8), 835–851.
- Nilsson, J. E. (2006). Regions with Comprehensive Technical Universities: The Case of Aalborg, Luleå and Oulu. In *The Role of Universities in Regional Innovation Systems*.
- Norrköping municipality, 2016. *Municipal facts 2015*. Retrieved from: <http://www.norrkoping.se/download/18.3ef6b1d158f1bd46e11d3ad/1489478837194/Norrkoping-i-siffror-2015-ENG.pdf>
- Norrköping Science Park, 2017. *Företag i parken*. Retrieved from: <http://www.nosp.se/vara-foretag/>
- OECD, 2016. *Education at a Glance 2016 - OECD Indicators*. Retrieved from: <http://www.oecd-ilibrary.org/docserver/download/9616041e.pdf?expires=1496921105&id=id&accname=guest&checksum=B15C5A3DAAC3D197B6B312103415DAFF>
- Öberg, G. (2009). Facilitating interdisciplinary work: Using quality assessment to create common ground. *Higher Education*, 57(4), 405–415.
- Sachs, J., & Clark, L. (2017). Learning Through Community Engagement.
- Science Park Mjärdevi, 2017. *Networking in Mjärdevi Science Park*. Retrieved from: <http://mjardevi.se/network/>

Transitioning from an Economic to a Broader Social Impact

A Case Study of a Swedish University

- Sectra, 2017. *Sectra's History – The road to world-leading products*. Retrieved from: <http://www.sectra.com/investor/about/history.html>
- Statistiska centralbyrån, 2017. *Population by region, marital status, age and sex. Year 1968-2016*. Retrieved from: http://www.statistikdatabasen.scb.se/pxweb/en/ssd/START_BE_BE0101_BE0101A/BefolkningNy/?rxid=810d4445-986f-41a7-890c-aaa231c93bff
- Svensson, P., Klofsten, M., & Etzkowitz, H. (2012). An Entrepreneurial University Strategy for Renewing a Declining Industrial City: The Norrköping Way. *European Planning Studies*, 20(4), 505–525.
- UKÄ, 2017. *Regulations that govern Higher Education Institutions*. Retrieved from: <http://english.uka.se/facts-about-higher-education/overall-responsibility-and-regulations/regulations-that-govern-higher-education-institutions.html>
- Uyarra, E. (2010). Conceptualizing the Regional Roles of Universities, Implications and Contradictions. *European Planning Studies*, 18(8), 1227–1246.
- Vallastaden, 2017. Organisation. Retrieved from: <https://www.vallastaden2017.se/organisation/>
- Youtie, J., & Shapira, P. (2008). Building an innovation hub: A case study of the transformation of university roles in regional technological and economic development. *Research Policy*, 37(8), 1188–1204.