

3 CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

Peter van der Sijde

3.1 Introduction

This chapter describes the contribution of research by the HEIs to regional innovation. Section 3.2 starts with a description of the regional dimension in the missions of the HEIs. Section 3.3 highlights the most important framework conditions for promoting research and innovation to impact the region on the basis of a comprehensive model. Section 3.4 discusses the interfaces facilitating knowledge exploitation and transfer, and section 3.5 contains the strengths, weaknesses, opportunities and threats related to contribution of research to regional innovation in the region.

3.2 Responding to regional needs and demands

The UT's mission is being an entrepreneurial (technical) research university focusing on technological developments in the knowledge society. Internationally recognized excellence in research and teaching is its objective, as well as stimulating economic and social development via the resulting valorization activities in the region (see 3.3.3.1). The ITC presents itself as an internationally recognized centre of excellence in international education in geo-information and earth observation and is a gateway between the less developed countries and the Western world. The ITC has no explicit regional dimension in its mission, but contributes via its application-oriented approach to the development in the region (see 3.3.3.3). Saxion as a "broad" university of professional education is embedded in the region and their regional dimensions can be seen in the supply of educational programmes tailored to the economic, social and cultural needs of the region and via its knowledge centres (see 3.3.3.2). Edith Stein is a monosectoral university of professional education for the education of primary school teachers. It maintains contacts with all primary schools in the region (alone and together with *Expertis* – see 3.3.3.3). AKI as a university for arts education maintains a national and a regional focus in its mission.

Each of the universities made provisions to meet the regional needs and demands developing mechanisms to overcome the (perceived) incompatibility of the HEI and industry (see 3.3.3).

3.3 Framework conditions for promoting research and innovation

Recently (2001) a benchmark study (commissioned by the EU and the Austrian Federal Ministry of Economy and Labour) on "industry-science relations" was jointly published by Joanneum Research in Austria. This study presents a conceptual framework (see figure 3.1) to study these relations, based on the following assumptions:

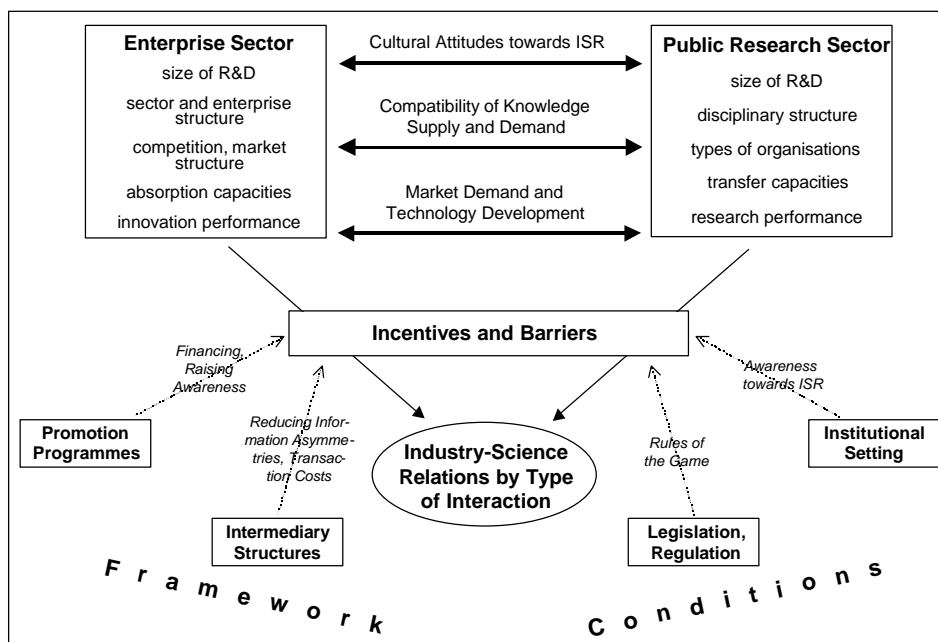
- The enterprise sector and the public research sector (which includes universities) are different;
- There are relations between these sectors. The relations are stimulated by incentives and hindered by barriers;
- The barriers and incentives can be influenced by framework conditions, such as "promotion programmes", "intermediary structures", "legislation and regulation", and "institutional settings".

The incentives stimulate the interaction of HEI with industry and visa versa. Incentives for the interaction are e.g. "mutual learning", which leads to the creation of new (practical) knowledge, "personnel mobility" – the exchange of personnel between the two types of organizations, "exchange of knowledge" – both codified (in papers and patents) and tacit knowledge, and "opening up of (new) networks" for use by both parties. Barriers are also present and they complicate the cooperation: "uncertainty of the outcome" – industry wants concrete results while universities (mostly) prefer to deliver a certain effort, without the output obligations, "information asymmetries" – difference in understanding the "supply" and the "demand" by both types of organizations, "different objectives" – the difference between contributing to science and shareholder value leading to different cultures, "financial obstacles" – although the picture is changing many companies still think that knowledge is

for free and that universities provide their services for free. The incentives and barriers can be summarized (see also figure 3.1) into:

- differences in culture and attitudes
- differences in supply and demand of knowledge
- difference between market demands and technology development
- The mechanisms that influence barriers and incentives are discussed in the remaining sections in this chapter:
- legislative and regulative issues (3.3.1)
- promotion programmes (3.3.2)
- institutional settings (3.3.3)
- intermediary structures (3.3.4)

Figure 3.1: A conceptual model for analysing industry-science relations



Source: EU and the Federal Ministry of Economy and Labour in Austria (2001)

3.3.1 Legislative and regulative issues

Ownership of intellectual property

In 1996, the Dutch ownership of intellectual property Act was changed with respect to inventions made by researchers in higher education institutions. Before 1996, ownership was with the inventor; since 1996 ownership has been with the higher education institutions.

The consequence of this is that only the HEI can enter into arrangements to exploit the Intellectual Property (IP) generated in the institutions. Further, HEIs themselves are allowed to set framework conditions regarding the ownership of IP; in general terms, there are three different modes:

- IP generated via HEI-financed research: in this case the HEI owns all rights to the IP
- IP generated in the framework of a (research) contract for a particular (large or small) company: HEI can enter into a contract specifying who owns what and which party owns the right to exploit the IP generated from this contract.
- IP generated in a research consortium: a research consortium formed to carry out a project under a European Framework Programme – the terms for exploitation are written down in a Consortium Agreement among the partners and at the end of the project the partners have to

submit an exploitation plan. Most often, the results are co-owned by all partners, although exceptions are possible.

Innovation Platform (national/regional)

The national government stimulates cooperation between HEIs and industry and in fact realizes the importance of the HEI in our knowledge economy. The document negotiated between the political parties in government (*Regeerakkoord*, coalition agreement) from 2003 states that “the Netherlands should be among the leading European countries in the area of higher education, research and innovation”. To implement this view/intention the Innovation Platform⁷ chaired by the Prime Minister was created; one of the tasks of the platform (after Finnish model) is to develop strategies for the development and exploitation of knowledge. The Platform is to propose concrete actions to the government, who in its turn will create means to implement these. On a regular basis, this Platform published reports for policy measures.

In 2004 the Provincial Government of Overijssel and the Network City Twente set up the Regional Innovation Platform Twente (independent from the national one), which represents regional industry and higher education, and has the objective to present Twente as a top technological region. In April 2005 a first report was issued (*Kan Twente sneller in de toekomst aankomen? – Will Twente be able to arrive faster in the future?*) in which the Platform published its work plan and actions.

Innovation Action Programme

The Twente region is a former Objective 2 region and since 2000 Twente has been in the so-called phasing-out phase; this means that there still are financial means to stimulate sustainable projects in the regions under the Innovative Action Programme (IAP)⁸. One of the action lines in this programme is “*technostarters*”. In other action lines, cooperation between (higher) education and companies (industry) is stimulated and financially supported.

Human mobility

The recruitment (especially highly educated) personnel proved to be difficult for those coming from non-EU member states. Although arrangements for study purposes can be made, it is harder to retain former students from non-EU countries for the Twente economy.

3.3.2 Promotion programmes

(Public) promotion programmes provide financial resources for industry-science relations and thus compensate for high transaction costs, spillages, uncertainty of R&D results, and a lack of financing by risk-averse capital markets. In the Netherlands, and specifically in Twente, several actors have programmes to provide financial resources to promote and stimulate cooperation between industry and HEIs.

Ministry of Economic Affairs

To promote and stimulate cooperation between industry and higher education, the Ministry of Economic Affairs established some general instruments, which are (also) used in Twente:

- *Innovation-Oriented Research Programmes*, which promote technical-scientific research and its application by business and stimulate companies and research institutes to develop joint knowledge investment plans;
- *Open Technology Programme* of the research foundation STW (Foundation for Technical Sciences), which stimulates high-quality university research projects with high user involvement and good prospects for utilisation and research yield.

⁷ <http://www.innovatieplatform.nl>

⁸ <http://www.technopartner.nl>

BSIK

The national government issued a tender for the BSIK programme in 2003: a competitive fund out of which initiatives to strengthen the research infrastructure of the Netherlands are supported, using government income generated out of the receipts of natural gas exploitation. Sixty-seven research projects with a total investment volume of €3.6 billion were selected in 2003 to receive research subsidies. The UT was quite successful in applying for BSIK project funds: NanoNed⁹ (on nanotechnology), MicroNed (on microtechnology), Smart Surroundings¹⁰, Free Band and Transumo¹¹. The bulk of the BSIK funds are allocated to universities, taking the form of competitive grants for research projects in co-operation with the private sector.

Senter/Novem

Senter/Novem¹², a government agency for sustainability and innovation, is in charge of a number of (financial) instruments to create HEI-industry cooperation. For example, Senter/Novem promotes high-tech start-ups through the *Techno Partner* action programme, which aims at improving the start-up climate by:

- a seed facility to support the bottom end of the Dutch venture capital market, thereby helping high-tech start-ups to satisfy their capital requirements at an early stage;
- the Knowledge Exploitation Subsidy Agreement (SKE), the objective of which is the quicker utilisation of scientific knowledge by high-tech start-ups both inside and outside knowledge institutes and publicly financed research institutes; and
- *Techno Partner*, a platform offering information and expertise and creating and updating an inventory of the obstacles faced by high-tech start-ups.

Other financial programmes

Some other financial incentives are:

- WBSO (Law for the Stimulation of R&D): a tax incentive for industry and HEIs that carry out industrial research;
- Innovation Cooperation Programme;
- Innovation vouchers for companies to use with any knowledge supplier.

Foundation Innovation Alliance

In 2003 representatives from industry, intermediary organizations and the HBO-raad (Association of Universities of Professional Education) founded the Foundation Innovation Alliance, SIA, to foster and stimulate “knowledge circulation”. Knowledge circulation is the process of knowledge sharing and creation between UPE, students and industry. The SIA secured money from the government to distribute financial incentives to UPEs to start knowledge circulation projects with a strong regional basis. Saxion has successfully applied for two of those projects in June 2005.

Foundation for Knowledge Development

Although UPEs are getting a research task (by law), traditionally they do not carry out research because of the lack of facilities and expertise; although since 2002 some UPEs have dedicated personnel for research.

Recently “*Lectoren*” are established to set up and implement research programmes; the “*lectoren*” are financially supported by the SKO (Foundation for Knowledge Development) for a period of four years.

UPEs can apply for “*lectoren*” in areas they themselves consider to be strategic for the further development of the UPE in the regional context.

⁹ <http://www.mesaplus.utwente.nl/nanofabrication/Links/nanoned.doc/>

¹⁰ <http://www.ctit.utwente.nl/research/projects/bsik/smartsurroundings/>

¹¹ <http://www.ctit.utwente.nl/internal/bsik/transumo/>

¹² <http://www.senter.nl>

3.3.3 Institutional settings

Institutional settings in HEIs determine the incentives and barriers for researchers in public science to engage in industry-science relations, including: evaluation criteria and procedures; individual remuneration; financing sources and schemes for R&D; institutional missions and organisational cultures; recruitment policies; auditing and strategic planning; administrative support etc. The main purpose of the institutional settings is to compensate for several failures in the knowledge market resulting in a low level of interaction between industry and science. By providing support in terms of searching for partners, negotiating contracts, and building up mutual trust, an attempt to overcome these inherent barriers to interaction is made.

In general, the Dutch HEIs follow three routes to exploit the results of research and to contribute to regional innovation:

- route 1: Cooperation with industry (e.g. contract research, strategic alliances, joint research & development institutes, joint ventures);
- route 2: Patents and licences;
- route 3: Creation of spin-off companies.

The routes used most often in the Twente region are “cooperation with industry” and the “spin-off” route. Route 2 is hardly used by the HEIs because it is not part of their strategic plan. Nevertheless, Twente applies for patents and licences more than any other region in the Netherlands¹³. Most of the applications are made by the regional SMEs.

3.3.3.1 Route 1: Cooperation with industry

The Twente HEIs present themselves at specialized trade fairs, exhibitions inside and outside of Twente. Furthermore, they present their research to the wider community of students, faculties, alumni and regional stakeholders via their magazines and university papers. Information is disseminated also via the website of the universities, faculties and institutes.

All HEIs are engaged in teaching and (applied) research. Both activities have an impact on the region. The UT has the regional dimension as a derivative of its international strategy, while the UPEs are primarily anchored in the region. The regional anchoring is expressed in three policy items:

- The development and offering of a broad package of integrated educational programmes in which competencies are central in the individual learning routes (see chapter 4 for examples of the HEIs). Edith Stein, for example, together with *Expertis Onderwijsadviseurs*, offers an integral package of services in the area of education, training and continuous professional education of teachers and educational managers.

IDC, see appendix G 6

The Industrial Design Centre (IDC) is a network for designers, manufacturers and higher education institutions in Twente. The network aims at raising the numbers of students in design studies and increasing the flow of creativity and product innovation in Twente. By matching the demand for and supply of expertise and design facilities, organising design meetings and coaching design projects, IDC has appeared to close a gap in this sector within the region. Since the Centre's establishment in 2003, almost 120 student projects, fifteen partner projects and ten facility projects have been completed. In addition, fifteen design meetings have been organised and over thirty products (re-) designed.

MTF, see appendix G 22

Mesa+ Technology Foundry is a partnership between several regional stakeholders in the field of Microsystems and Nanotechnology. Through this partnership, the MESA+ institute make available high-tech research-infra structure and services to regional industry and starting entrepreneurs (so called *Technostarters*) in the area of micro systems or nano-technology. This sector of industry normally doesn't allow for SMEs to be active (investments exceeds budget). By offering research facilities to be rented by our joint facilities for pilot production and office space near research groups the law of size is broken.

¹³ According to ir. B.J. 't Jong, octrooigemachtigde at Arnold & Siedsma, Enschede (Tubantia 22-2-2005)

- The development of educational programmes to meet the regional needs (see chapter 4 for examples), e.g. Fast Forward, a post-bachelor programme of 24 months in which high-potentials (Saxion graduates) receive additional training and traineeships in three (regional) companies to explore and develop their potential further; the programme runs in its fourth year¹⁴.
- The provision of research (capacity) via its knowledge centres:
 - S-CIO, Scienza and IDC (Industrial Design Centre).
 - The project *RegioRegisseur* was a successful one-stop shop for (regional) SMEs continued by S-CIO.
 - The UT concentrates its research in six so-called Spearhead Institutes:
 - MESA+, Institute for Nanotechnology;
 - BMTI, Institute for Biomedical Technology;
 - CTIT, Centre for Telematics and Information Technology;
 - IMPACT, Institute of Mechanics, Processes and Control Twente;
 - IGS, Institute for Governance Studies;
 - IBR, Institute for Behavioural Research.

LEV'L, see appendix G 8

The National Expertise network Demand-led Learning and Working (LEV'L) is a network of teachers, employers, students and others involved in demand-led learning and working projects. The demand-led learning route starts from the job, a small business or agency being a powerful learning environment. Job-inspired demand is used to design the personal training & education plan (POP). In innovation projects students and employers design an iPOP. This method means, on the one hand, tailor-made training for small businesses or agencies and, on the other, providing them with access to specific actual expertise so as to increase their innovative capacity. Exam committees monitor the quality of the bachelor's degree, including frequently used validation procedures for 'Appreciation of Prior Learning' (APL). More than ten universities for professional education have subscribed to Lev'l activities – as have various sectors and many companies. As a total, over 2500 students have followed this learning route.

Advice and Consultancy,
see appendix G 19

Advice and consultancy is an educational module with an added value, both for students and for professionals. Groups of students, acting as their own consultancy in school, accept orders from the field in order to pick up initial working experience. They thus learn how to function in actual situations (to assess relationships and political environments and to deal with problems strategically).

Companies and not for profit organisations, in turn, are provided with a professional solution to their problems, without the high payments usually required for regular consultants. The quality of the solution offered is guaranteed by the university teachers and the faculty, who, if need be, allocate additional working hours to the project. Annually, some fifty project groups work on issues referred to them by professionals.

In these activities, the regional dimension occupies centre stage: innovation, knowledge circulation and entrepreneurship. The establishment of *lectoraten* in the UPEs play a central role in each of these areas

Alliances with (regional) companies and institute: For all HEIs, strategic alliances with individual companies and clusters of companies, regional organizations and (local/regional) governments are for all HEIs important preconditions for regional engagement. All HEI have good (working) relations with the municipalities, and the regional governments, regional organizations (e.g. *Medisch Spectrum Twente* - the research and teaching hospital, *Roessingh*, and the schools in the region). There are also important alliances among the HEIs, e.g. Edith Stein cooperates with the UT, Saxion and SLO (National Institute for Curriculum Development in Enschede). ITC is in alliance with the Virtual Valley Twente for the creation of a 3D city model ("Digimap") and in the areas of its expertise with the local and provincial governments. On the socio-cultural level the AKI plays a key role, there is, e.g. the annual *Tart* (technology & art) manifestation. *Tart* is a cooperation between AKI,

¹⁴ See appendix G5

Saxion, UT and the Municipality of Enschede.

Role of the students in the regional engagement: The majority of students do practical assignments and/or traineeships in companies and institutes and via “knowledge circulation” students, the HEIs and companies learn from each other¹⁵. Specific learning routes have been developed to implement the knowledge circulation, particularly in the UPEs, e.g.:

- *Work-study programme:* students both study and work (see section 4.6);
 - Project LEV’L: a (national) experiment (led by Saxion) in cooperative learning in which the student is at the university for the first two years of study and after that s/he goes to a company for two years to acquire the remainder of the necessary competencies to graduate;
 - *Innoleren:* a regional experiment based on LEV’L
- *Student consultancy:* consultancy by students under supervision of the teaching staff, e.g.
 - HRM consultancy on career counselling and psycho diagnostics, and reintegration of employees. Faculty and students carry out consultancy.
 - Spatial planning and management consultancy, named Advice and Consultancy by faculty and students (see Best Practice above).

Facility Sharing: The HEIs have many up-to-date and high-tech facilities, which (small) companies do not own, but could be of interest. Under certain conditions these facilities are open to third parties. Examples are:

- Microsystems Foundry Twente: MESA+ established an accelerator and in this building some 10 to 15 companies are housed. In total the institute is involved in some 25 companies, that include first, second and third generation spin-off companies;
- T-Xcell: Thales and UT cooperate in this in order to commercialize mutually interesting technologies by sharing facilities;
- Wireless Campus: The Campus of the UT is a test bed for new wireless technologies;
- NDIX: The Netherlands-Germany Internet Exchange.

NDIX, see appendix G 23

NDIX, *Nederlands Duitse Internet eXchange* (Netherlands German Internet eXchange), is a 100Mbs Internet exchange platform, provided through a dark fibre network (Trent). Trent started as a research network connecting the University of Twente with key industry partners in Internet research providing the possibility of joint research and technological testing of network components. Soon after the first parts of the network had been taken into use, new opportunities arose – testing and developing applications. The University of Twente, the Province of Overijssel and the city of Enschede co-started the NDIX as an exchange point at the same time.

At the moment, over 45 companies, municipalities, schools and HEI are connected to the NDIX via dark fibre of Trent and 15 people find employment in these two initiatives. Costs for Internet Infrastructure in Twente are lower than the Dutch average.

3.3.3.2 Route 2: Patents and licences

Currently, the UT is the only HEI that owns a limited number of patents; patents are usually the result of contract research for industry. Table 3.1 gives an overview of the number of patents that are owned and/or developed by the research institutes and the size of the third flow of funds activities over the last couple of years.

Table 3.1 UT research figures

	2002	2003	2004
Total 3rd flow budget in m euros	27	25.3	29.0
Number of patents	40	49	29
Number of researchers	1,304	1,352	1,390

Source: Annual Report UT, 2004

¹⁵ Van der Sijde (2005), Kenniscirculatie en een ondernemende kennisinstelling – ingredienten voor een ondernemende regio. Tijdschrift voor Hoger Onderwijs, 23 (1), 44 – 61.

The 2004 UT Annual Review mentions that there were 5.4 patents per 100 research FTEs in 2002, 5.9 in 2003 and 3.2 in 2004. Recently, facts and figures were also published on Twente and the Netherlands for 2002; the figures show that in Twente per 1,000 companies there are 8 patents, while the country's average is 6.4. A recent study¹⁶ shows that 80% of the university money for research is matched with third flow of funds money. The HEIs do not have their knowledge actively patented.

3.3.3.3 Route 3: Entrepreneurship and creation of spin-off companies

In the Twente region, entrepreneurship and spin-off creation have been stimulated since the early 1980s.

Over the years, an elaborate support structure has been built up and both UT and Saxion cooperate, stimulate entrepreneurship and spin-off companies. The regional stakeholders play a very important part in this. Especially internationally, the Twente region is recognized as an entrepreneurial region – primarily as a result of sustained and coordinated policy of all stakeholders. Special mention deserves the cooperation in this field with Oost N.V. and the Ministry of Economic Affairs in the stimulation and financing of programmes for promoting entrepreneurship and university spin-offs.

Promotion and stimulation of entrepreneurship

The stimulation of entrepreneurship is an important policy issue in the university that receives both attention in education (via the UT expertise centre Nikos¹⁷ that implements a Minor programme for technical students and a second one for business students and a Master programme on Innovative Entrepreneurship; at Saxion the course in Small Business & Retail Management of the School of Business Engineering & Entrepreneurship provide a similar – Minor – programme), in research (via the institutional plans of the research institute and the S&T plan of the UT) and valorization (via the UT holding company and Saxion Centre for Innovation & entrepreneurship, S-CIO). Both Nikos and the “*Kenniskring*” and “*Lectoraat*”_KIO (*Kennis Intensief Ondernemen*) are active in the promotion and stimulation of entrepreneurship in the academic communities.

Spin-offs

The promotion and stimulation of entrepreneurship at the UT is drawn into the following programmes:

- **HTT:** Holding Technopolis Twente, the holding company of the UT. In HTT, the intellectual property of the UT is commercialized and managed. It also plays a role in scouting of opportunities.
- **TOP:** Since the beginning of the 80s the UT has stimulated the creation of (research and knowledge intensive) spin-off companies and in 1984 established the Temporary Entrepreneurial Positions programme (TOP) and created some 350 new companies of which about 76% still exist and create on average some 150 new jobs annually (see figure 6.1). Nikos executes this programme (see also figure 6.1).

TOP, see appendix G 20

The goal of the Temporary Entrepreneurial Positions programme is to support graduates, university staff and people from trade and industry to start their own companies Twente. Candidates have to develop a business plan in which the feasibility of the idea is indicated. The TOP managers guide this process. After completion the business plan is scrutinized by the TOP committee and after approval the entrepreneur receives (free of charge):

- office space and facilities
- business and scientific mentor
- interest-free loan
- access to networks

The period of support is one year. From its start in 1984, 370 people have joined the programme and have established 320 new high-tech companies. The average size of a TOP company settles at 5 to 6 employees after some years. Some 150 new jobs are created by (former) TOP companies every year.

¹⁶ C.P.M.J. de Waal, UT-Private, exploring privatization as an option to enhance the income generation and matching capacity of the University of Twente. Thesis EEP-MBA – IBO, 2005.

¹⁷ Nikos, part of the UT Institute for Governance Studies – IGS

- Tissue Engineering Accelerator (see also 3.4.2.2): At the beginning of 2004, BMTI at the UT established an accelerator for biotech companies and currently houses and facilitates six companies.
- The Virtual Incubator: a feasibility study is carried out to explore the possibility of companies as an incubator coordinated by S-CIO. It is about to be implemented.
- Saxion prepares a spin-off programme called “Fast Forward in Entrepreneurship”, based on Fast Forward (appendix G5).

3.3.4 Intermediary structures

Intermediary structures cover both physical and immaterial infrastructure such as technology centres, incubators, consulting networks, information networks and databases devoted to fostering industry-science relations, and represent those framework conditions which may directly be designed by policy.

In the process of cooperation between HEI and industry, intermediary “structures” or actors play a role (see also section 1.1.5). Specifically to enhance the innovation capacity in SME the Syntens¹⁸ organization – in the past also known as “innovation centre” – plays an important role in bringing knowledge suppliers (e.g. the universities) and demands (from – regional – industry) together (a route 1 mechanism). Several other instruments to promote science-industry relationships have been in operation such as Oost B.V. (especially with regard to inward investment and “technostarters”). The cooperation is also stimulated via the large technological research institutes (the Netherlands Institute of Applied Science - TNO¹⁹; a research and technological organization, RTO) of which there are only a few left in Twente after the recent reorganization and concentration in the Eindhoven area. There are also *Leading Technological Institutes* (LTIs, in Dutch *Technologische Top Instituten*). One of them, the Telematics Institute²⁰ created in 1997, is based in Enschede. Projects carried out by the Telematics Institute are jointly defined (industry and Telematics Institute) and co-funded by the Dutch government and Dutch business and industry.

3.4 Interfaces facilitating knowledge exploitation and transfer

3.4.1 Mechanisms to exploit knowledge from the HEIs

In the previous section, three routes of exploitation of research were introduced. Quite different are the independent mechanisms installed by the HEIs. In Twente there are two examples of these independent mechanisms:

- Independent expertise and demonstration centres
 - Membrane Application Centre Twente, MACT, a service centre for membrane applications;
 - Laser Applications Centre (a cooperation between UT and *Koninklijke Metaalunie* – Royal Society for the Manufacturing Industry) that jointly will boost innovations in the sector.
- “Facility sharing”. Both the UT and Saxion opened up its facilities for industry in general and SME in particular. In the sections on Saxion and UT, specific examples of facility sharing are mentioned.

3.4.2 Incubators, science parks, clusters and venture capital

3.4.2.1 Science parks

Within the Twente region, there are two Science Parks; the Business & Science Park and the Knowledge Park Twente. The Business & Science Park (BSP) is located next to the Campus of the UT (see figure 3.2). It is an area for companies that combine science and business. Since the early 1980s, the BSP has developed via several stages into an industrial estate with a high interaction

¹⁸ <http://www.syntens.nl>.

¹⁹ <http://www.tno.nl>

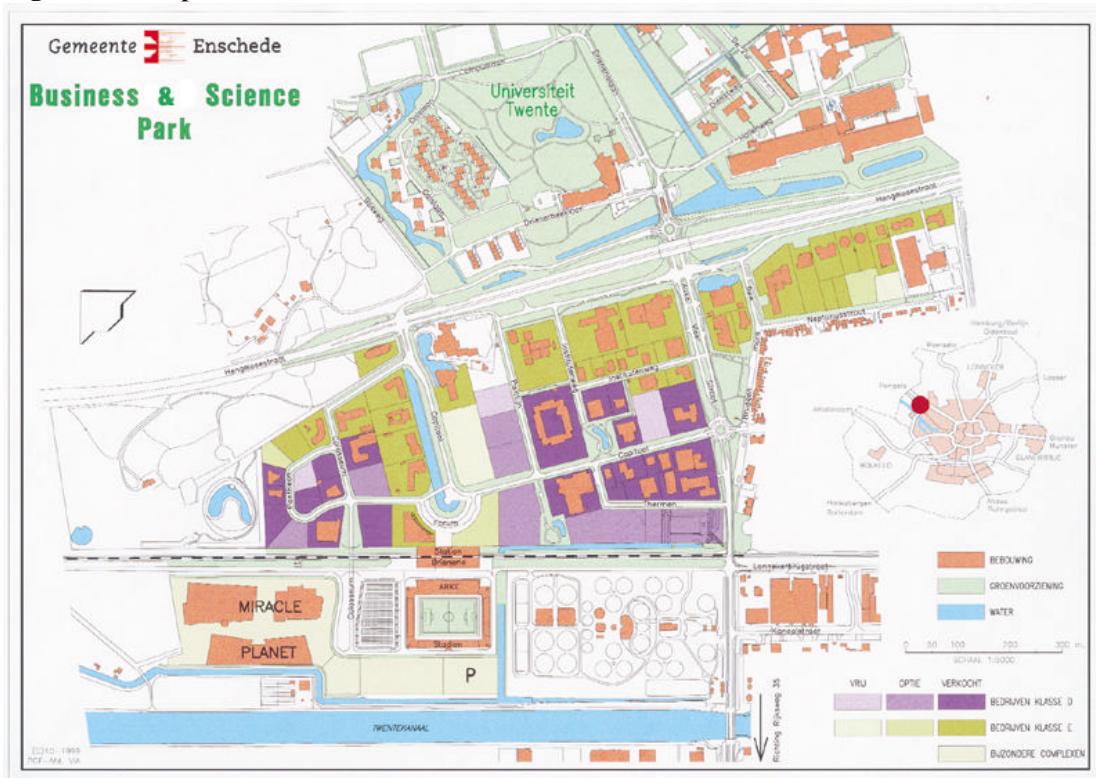
²⁰ <http://www.telin.nl>

between science and business. In total it comprises about 40 hectares and the location of the Business & Technology Centre Twente (see 3.4.2.2). Since September 2002 there have been about 200 companies on the park of which 93 provide services, 86 are knowledge intensive companies and 21 are in different areas. In total, some 4,000 people are employed on the park.

Knowledge Park Twente.

Knowledge Park Twente (KPT) focuses on the economic strengthening of Twente and the east of the Netherlands – it offers locations for innovative companies and stimulates the creation of value added jobs by initiating spin-offs and start-ups from research, joint research facilities and project development. The valorization of knowledge is the key activity to generate jobs. Its aim for 2020 is to have 10,000 new knowledge intensive jobs in Twente. KPT is located around the Campus of the UT and is a venture in which the UT, the Municipality of Enschede and the Regional Development Agency Oost N.V. cooperate intensively.

Figure 3.2, map of the Business & Science Park and the UT



Source: Municipality of Enschede

3.4.2.2 Incubators

The oldest incubator in the Twente region is the BTC Twente (Business & Technology Centre Twente²¹, modelled after the American initiatives of Control Data Corporation in 1982. At the moment, it houses some 80 companies and it has a policy of easy in – easy out and the company can have more space in the building as it grows. Next to this, BTC Twente stimulates formal and informal contacts between its incumbents and companies on the Park. The management also functions as a coach to the companies. Via the BIC Twente, BTC Twente is a

Tissue engineering, see appendix G 24

Tissue engineering is a business-accelerator programme. Goal is to improve the business perspectives of new products and services that have become available from research by the Institute for Biomedical Research (BMTI). The activity has been set up within a private company in public private partnership (40% public, 60% private). Since its start in 2003, 6 new companies have started.

²¹ ²¹ <http://www.btc-twente.nl>

member of EBN (European Business & Innovation Centres Network, a pan-European organization). Both the UT and Saxion are shareholders of the BTC Twente. At the University Campus there are two “accelerators”, incubators for speeding up growths in the start-up phase of companies: one in the area of nanotechnology (related to MESA+) and one in the area of tissue engineering (related to BMTI).

Saxion explores the concept of “virtual incubators” and a pilot study is in progress for the Deventer Campus; if proven feasible at the Deventer Campus then it will also be implemented at the Enschede Campus. In May 2005, the ROC of Twente opened its incubator called @Campus Business Centre in Hengelo – primarily focused at companies created by its own students, but open for companies created by graduates of other educational institutions and industry.

3.4.2.3 Formal and informal venture capital

In general, it can be remarked that the situation regarding venture capital in Twente is poorly developed. Of course, there are a few initiatives. Participation Company East Netherlands NV (*PPM Oost NV*) takes part in capital investments in companies in the provinces of Gelderland and Overijssel. The company will take part in the favourable business environment that exists in the east of the Netherlands. Especially interesting for PPM Oost NV are the high-tech and mature companies as well as infrastructure creating activities. PPM Oost is currently supporting roughly 60 companies with a capitalization of €48 million. Shareholders include the UT and Saxion. Other venture funds are the *Reggeborg Groep* (this fund focuses – but not exclusively – on infrastructure investments) and *OPM* (Overijssel Participation fund – this fund invests in Overijssel companies, not restricted to any type of company). Of course, banks do play a role in these activities via their own participation funds and/or private banking activities.

Also with regard to the informal investors (“business angles”), similar remarks can be made: they are either not there or very hard to find. Some banks do have “matching services”, (matching “capital” with “companies”), and on an irregular basis, meetings are organized between (informal) investors and companies (“Seventh Heaven”, an initiative of the Dutch informal investors network, NBIB; in Twente organized together with the TOP programme). Currently, Nikos is making efforts to organize a network of informal investors in Twente.

3.5 Conclusions

In this section, some conclusions are drawn from the preceding sections. The conclusions are formulated in strengths, weaknesses, opportunities and threats of the Twente region with respect to the contribution of research to regional innovation.

Strengths	Weaknesses
<p>1. <i>Research focal areas</i>: Clear choices have been made about the research focus of the region; the foci do determine the direction of further development.</p> <p>2. <i>Knowledge infrastructure</i>: Over the years, a good knowledge infrastructure has been built up. This infrastructure consists of “hard” elements such as laboratories, incubators, science parks, and of “soft” elements such as expertise and human resources.</p> <p>3. <i>Entrepreneurship</i>: The region put a major emphasis on “entrepreneurship” and this becomes visible in policy documents and in the creation of spin-offs from the HEI.</p>	<p>1. <i>Underutilisation of knowledge</i>: Although a lot of knowledge is produced in the region, a weakness is in the exploitation of it.</p> <p>2. Absence of business angles and venture capital</p> <p>3. <i>Lack of “big names” on the BSP</i>: The R&D in the region is primarily carried out by the HEI; there are hardly any other public and private organizations doing this and function as a magnet to attract other organizations and attract and retain highly skilled personnel.</p>

Opportunities	Threats
<p>1. <i>Knowledge production</i>: All institutes contribute to the production of knowledge. As a result, there is a huge potential industry and regional SMEs can tap into.</p> <p>2. <i>Government policy on entrepreneurship and innovation</i>: The Dutch government recently launched its plan “Peaks in the Delta” in which Twente is recognized as an area that will receive extra attention (and grants).</p> <p>3. <i>Willingness to cooperate</i>: There is a great willingness the HEI to cooperate with industry and SMEs, as well with the other stakeholders. The cooperation of UT and Saxion with regional companies offers great opportunities.</p>	<p>1. <i>Sub optimisation</i>: Although there is the willingness to cooperate between all actors in the region, there is nevertheless the threat that it is “easier” to do it all by yourself.</p> <p>2. <i>Competitive funding</i>: As more funds are coming available, the threat is that these funds are becoming available for just one actor competing with actors from outside the region and not cooperating within the region.</p>