

4 THE CONTRIBUTION OF TEACHING AND LEARNING TO LABOUR MARKET AND SKILLS

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4.1 Introduction

This chapter is about the contribution that the higher education institutions in Twente make to the supply of well-educated individuals in their region. With the advent of the knowledge-based society it has become clear in recent years that the regional development and social cohesion in a region is heavily dependent on the knowledge infrastructure and the linkages between knowledge producers and local industry and local labour market. The challenge is to link all actors more closely, and not just to seek a more direct relationship between higher education institutions and business, but to look at all parts of the chain and also look at relationships between individual higher education institutions in Twente. As will become clear in this chapter, Twente has made significant progress in building closer relationships of this kind, but still the gaps between higher education institutions are significant as are the gaps between higher education and regional actors. The challenge is to engage higher education institutions with all aspects of the regional development process in a region. This is not necessarily asking them to change their mission from a national (or even international) one to a more regional one, but to align the national and regional missions and recognise that these missions are not necessarily mutually exclusive. The research universities as well as the universities of professional education both contribute to the region's stock of human capital and offer courses as well as research findings that are an input into the region's production process and contribute to its cultural and social well-being. However, by working together and building closer partnerships between the knowledge providers and local stakeholders the teaching and learning in higher education institution can better meet the demand for skills and resources in the region.

To achieve a higher contribution in this respect, the argument is put forward in this chapter that the entrepreneurial character of the University of Twente (i.e. its students and its academics), and the natural links that exists between the UPEs in Enschede and Hengelo on the one hand and regional business, schools, and government organisations on the other provide a good base for exploiting the knowledge base in Twente for the advancement of the region. In recent years, a vision for the further socio-economic development of Twente has been formulated by the regional authorities and regional stakeholders (as expressed in the Technology Valley idea). In chapter 3, we already mentioned the contribution that *research* in Twente's higher education is making. This chapter will look at teaching and learning and address where and how it interacts with the local community. To understand where mutual benefits can be improved, however, it is important to first learn where one is coming from. Therefore, we start with a quick characterisation of the region and then look at the mechanisms that affect the interaction between higher education and the region.

Chapter 1 of this report has painted a picture of the economic identity of the Twente region. The present economic situation is a result of the past and the needs that derive from trends that may be observed in today's economy. As was observed in chapter 1, the regional economy is still characterized by a large presence of traditional sectors like manufacturing and construction, which represent more than a quarter of employment. This is much higher than the average for the Dutch economy and stands in contrast with trends that suggest that more technology-oriented (even high-tech) activity will become more important for the Dutch – and indeed the Twente – economy. Projections carried out by labour economists, regional government and some of the regional think tanks have indicated that Twente has the potential to further develop the sectors of medical technology, telematics, nanotechnology and tissue engineering. Combined with the presence of some large companies with an international stature and some large medical institutes, a move into a more technology-oriented direction holds some promise for Twente. It is a topic that is discussed actively by many regional and national stakeholders (see chapter 6 of this report), the most prominent of which, the Innovation Platform Twente, has received wide support from government and regional authorities.

Further developing the regional innovation potential and moving towards more high-tech economic activity, however, requires the presence of a well-educated labour force. While the education providers in Twente recognize this, there still remains a relatively high unemployment rate among the youth of Twente – even among the higher educated. At present, the Twente region is performing less well economically than other Dutch regions and actual regional innovation performance is only mediocre. The challenge that exists is how higher education providers can turn some of their R&D resources and graduates to the needs of the Twente economy. As will also become clear from other chapters in this study, there certainly are opportunities, but a collective effort is called for to generate more value added around the higher education institutions and a number of knowledge-intensive firms around them.

This chapter therefore will pay attention to the question how and where the higher education institutions of Twente draw upon the specific characteristics of their region when it comes to their educational provision. Do existing educational programmes as well as the new programmes to be introduced reflect or interact with regional industry? To what extent does regional demand or regional expertise inspire the shape and contents of the curriculum? And when it comes to collective efforts, to what extent do the HEIs in the region facilitate voluntary associations and coalitions?

We will show that the needs of the region lie close to the heart of the teaching activities in two out of the three UPEs in Twente. The regional research university, unlike the other higher education institutions in Twente plays a more nationally oriented role in its education/training activities and a national/international role in its research. This holds even stronger for ITC. We will also argue that the region has particular strengths and weaknesses. Particular strengths are in high quality programmes, as evidenced in teaching quality assessments; regional innovation potential in selected areas (health, technology); the strong linkages between Saxion and regional industry; and moreover in the internationally renowned ‘entrepreneurial and innovative character’ of UT. Weaknesses are to be found in the fact that barriers still exist between SME and higher education; and that most linkages are initiated, managed and monitored only on a decentralised level in HE institutes.

The next section (4.2) presents some of the choices made by the HEIs in Twente in as far as these touch upon the interaction between their educational provision and the region. Section 4.3 then discusses the extent to which labour market information feeds in the educational programmes. This leads to a section on student recruitment: where do Twente’s students come from? The main section in this chapter is about the various instruments (and examples) of interaction between the HEIs and their region (section 4.4). Other topics related to the interaction between regional demand and curricula are treated in section 4.5. The final section (4.6) summarizes the various topics and examples of interaction between region and the education portfolio of the higher education institutions in Twente and presents some conclusions.

4.2 Strategic choices made by the HEIs

As was already stated in chapter 2, the higher education institutions that currently operate in Twente to a large extent have developed in response to regional needs and national policies responding to these needs. This holds for the universities of professional education (UPEs) that offer higher vocational training and carry out some applied research, as well as the research university – the UT.

Like elsewhere in the Netherlands, the UPEs in fact were established on the initiative of professional organizations to cater for the regional demand of qualified professionals. The history of the UPEs goes back to the guilds in the 18th century when schools were set up to cater for the needs of agriculture and industry. For Twente, this meant that vocational training institutes were set up to respond to the needs of sectors like machinery, manufacturing, construction and the textile industry. Out of these institutes the higher vocational training institutes (*hogescholen*) grew, and in the 1980s the UPEs, as they came to be known officially, became part of the higher education sector. Over time, the scale and scope of the UPEs evolved to what it is today. The variety in programmes offered by the UPEs in Twente nowadays does not differ substantially from that of other UPEs in the Netherlands. However, the link between the UPEs and their region – including regional business – has always

remained intact. It is fair to say that every region in the Netherlands has its own UPE – with some of the larger cities (including Enschede) having the luxury of more than one provider of higher professional education situated in their region.

For the research universities, the natural link between region and institution is less obvious. Although the decision to set up a technical university in Twente in 1962 was based partly on regional criteria, the university's programmes were not explicitly tied to regional demands and the foundation of the university should not be seen as compensation in a Keynesian sense.²² The reason is that the market of every Dutch research university is the Netherlands as a whole – and for some it even extends beyond the Netherlands. Many universities in the Netherlands however do feel a strong obligation to their region; partly based on the simple fact that they are physically located in a region and most of their students and staff live there. At the same time the research university is active in carrying out research, consultancy, contract education and other services for the public organizations and private businesses in the region. The education provided by the UT is heavily intertwined with its research. Academic research today increasingly takes place in interaction with public and private actors in society.²³ This is the case even more so for a primarily technical university. This implies that regional needs and the regional R&D agenda do have an impact on the university's teaching and learning activity.

In the remainder of this section we present the strategic choices made by the higher education institutions (HEIs) in Twente and the extent to which they pay attention to regional educational demands.

4.2.1 University of Twente

The mission statement of the UT²⁴ as set out in its strategic plan explicitly states that the university regards itself as an entrepreneurial research university. While it strives to operate in national and international fields, the mission statement also stresses that the university would like to see its educational and research activity contribute to the economic and social development of its regional environment. This environment covers the North-Eastern part of the Netherlands, Twente and the Euregio²⁵.

To the East, the regional partners of the UT feature in the so-called TRIANGLE project (see chapters 3 and 6) aimed at encouraging the utilisation and bundling of knowledge and opportunities within the food, health and technology sectors.

These knowledge clusters are concentrated around Wageningen/Gelderse Vallei (Food Valley), Arnhem/Nijmegen (Health Valley) and Twente (Technology Valley).²⁶ The universities of Twente, Nijmegen and Wageningen, together with companies such as AKZO Nobel, Vitatron, Abbot and Axis, and the provinces of Overijssel and Gelderland, have formed a steering group (Triangle) to promote innovation and to strengthen the regional economic base. For the UT, the region extends beyond Twente to the North and the East. An important partner situated to the north of the University of Twente is the University of Groningen. Here collaboration – mostly in research – takes place in the fields of nanoscience, biomedical engineering, life sciences and medicine and technology.

²² Florax (1992: 70) stresses that the foundation of the UT was not a direct answer to economic decline in the region. Its foundation was part of The Hague's higher educational policy for a longer time. A few years earlier, a similar institute was founded in the municipality of Eindhoven in the South of the country.

²³ This is known as the Mode 2 type of knowledge production – contrasting to the Mode 1 type. In Mode 2 knowledge production takes place in the context of application, while in Mode 1 it is the context of discovery (see Gibbons et al., 1993).

²⁴ Universiteit Twente, Instellingsplan 2005-2010. In particular section 1.

²⁵ The Euregio is an area covering both sides of the Dutch – German border and covers the municipalities/cities of Enschede, Hengelo, Oldenzaal and Gronau, Münster, Osnabrück.

²⁶ See chapter 3, and the report 'Peaks in the Delta' (*Pieken in de Delta*), published by the Dutch Ministry of Economic Affairs (2004).

4.2.2 Saxion

Saxion aims at offering higher vocational education in a wide range of educational types. Saxion is increasingly aiming at developing, utilizing and managing knowledge in interaction with professional fields and society. Interaction among different disciplines and communication with society, according to Saxion's strategic plans, are crucial for this because socio-economic innovation and knowledge breakthroughs increasingly appear to take place on the interfaces of disciplines and in interaction of higher education institutions with business and industry.

With respect to the latter: Saxion also aims at being anchored in the region. For Saxion, the region is broader than the Twente region. According to its strategic plan, Saxion's hinterland extends over the province of Overijssel and parts of both Gelderland and Overijssel. Also, the German, Euregional area is theoretically considered as hinterland. Much more than research universities, UPEs serve regional goals. The majority of Saxion students are from the Twente region (see section 4.4).

Saxion tries to accomplish this anchoring and interaction for example through the so-called knowledge centres and knowledge circles (see chapters 2 and 3). The knowledge circles are built around the *lector* and actively seek to connect to regional stakeholders. Given the regional economic characteristics in the City Triangle (*Stedendriehoek*) region and the Twente region (see chapter 6), these stakeholders are mainly active in design, technology, health care, tourism, urban development, sustainability and security. They are therefore closely related to the clusters mentioned by the Twente Innovation Platform.²⁷

Masterclass MBA, see appendix G 10

The Masterclass is a course for students with high potential, employed in local organisations or living within a radius of fifty km from Twente, with an academic or UPE background and with a minimum of five years' experience. The course consists of two parts:

- 1) A two-year Masterclass programme which offers a multidisciplinary approach covering twelve business areas;
- 2) After successful completion of the Masterclass, participants may enter the Executive MBA year of Career Centre Twente.

On completion of the course, the participant identifies and tackles strategic management issues and is able to analyse, assess and implement change in his/her own organisation. The key for success is the emphasis on participation of local organisations - direct benefit from a strong and lasting local network.

4.2.3 Edith Stein

Edith Stein is one of 40 locations in the Netherlands where students can receive a training to become a schoolteacher in the primary education sector. ES is located in Hengelo and maintains close contacts with about 300 primary schools in Twente and the regions to the east and north of Twente (Salland, Achterhoek). This illustrates the institution's wish to respond adequately to the demands in the region. As a result of the close relationships with regional schools, many of the institution's graduates find a job in the region's schools in primary and secondary education. ES has an Advisory Board consisting of 15 persons, many of them heads/directors of local schools (primary and vocational). This board gives advice on the curriculum and the relationship between education and the professional field.

To combat the future shortage of teachers and school managers in primary schools, ES is seeking close contacts to every single regional educational institute in the region. The two *lector positions* (see chapter 3) in the field of educational innovation underline the ambition of ES to solve the regional problems in Twente. Details of the employment in this sector are stated in appendix I.

4.2.4 ITC

ITC does not serve an explicit regional goal in its educational provision. It is not aimed at the Twente region. In contrast, it solely aims at being an internationally recognized centre of excellence in its chosen disciplinary specialization – that of geo-information and earth observation. ITC's education and research activities are aimed at an international market – in particular developed countries in

²⁷ See also chapters 3 and 6.

Africa and Asia.²⁸ Since 1950, over 17,000 students have graduated from the institute. These students originated from more than 160 countries. This makes ITC the most international higher educational training institute in the Netherlands. ITC does not recruit students particularly from the Twente region.

4.2.5 AKI

AKI has no specific policy on attracting students from the Twente region.²⁹ AKI promotes itself as an international academy of arts.³⁰ Many teachers and students participate in international programmes. In 2003, some 229 foreign students studied at AKI. This is about 43 percent of the total number of students. Foreign students are mainly from European countries, in particular Germany.

4.2.6 SWOT

SWOT (*Stichting Wetenschappelijke Opleidingen Twente*) was founded in 1967 by some major Twente organizations and the UT. It especially aims at educating middle- and higher-level managers. Since 1967, about 1, 2000 students have graduated from SWOT. SWOT's goal is providing scientific education, especially to young and mid-career professionals in the business sector. Similar management institutes can be found all over the country. Therefore, SWOT explicitly aims at students from the Twente region³¹ and the main share of its students originates from this region. SWOT therefore explicitly serves a regional goal, for example through its successful Regional MBA programme.³² Nevertheless, it recently opened branch offices in the cities of Utrecht and Nijmegen.

Small Business Growth Programme, see appendix G 3

The "Small Business Growth Programme" is an entrepreneurship /business administration course for directors, business unit managers and (family) successors in the SME sector. Participants will have at least a few years of managerial experience and are mostly from the Twente region. The programme stimulates access to and use of the local network. The emphasis is on business disciplines and/or personal management skills in reference to day-to-day problem matter. Participants are asked to write and implement a business plan, assisted by an experienced and technically oriented business administration student of Saxion or Twente University (UT). There is mutual benefit from the interaction between participant and student - the former uses theory developed by the latter, and the latter obtains access to practice (SME field work). The programme is offered twice a year. The group size varies from fourteen to sixteen participants. Group 33 has recently been established.

4.2.7 TSM

TSM Business School is the international graduate school of the UT. It was founded in 1987. Since then, it has presented itself as an innovative institute for postgraduate management education. Unlike SWOT, TSM does not aim at students from the Twente region. The majority of its students are from abroad or from the rest of the Netherlands. TSM does not serve an explicit regional goal in Twente, although one of its successful courses ('Small Business Growth programme'³³) does have a substantial number of students from Twente.³⁴

4.3 Labour market information

To stay in close contact with society and to monitor the trends in labour demand, the HEIs in the Twente region keep a close watch on labour market trends in their region. The labour market for university graduates and UPE graduates is monitored intensively in the Netherlands. On a national level the Dutch Statistical Agency and several research institutes do this. Also, universities and UPEs have in recent years started to cooperate in collecting labour market information on their graduates.

²⁸ ITC, annual report, 2004.

²⁹ Telephone interview with Ms. Egging, AKI-employee.

³⁰ ArtEZ annual report, 2003.

³¹ Information provided by Ms. Audrey de Jonge, SWOT-employee.

³² See appendix G10.

³³ See appendix G3.

³⁴ Telephone interview with Ms. Josien den Ouden, TSM-employee.

There are national initiatives (the Alumni Monitor of the Dutch universities that uses a uniform questionnaire³⁵) as well as local initiatives and graduate surveys carried out by individual universities. Both the UT and Saxion monitor the careers of their graduates. An example from the UT is the figure (showing hot spots) below that shows the location of the university's graduates.

Figure 4.1: Concentration of graduates from the UT

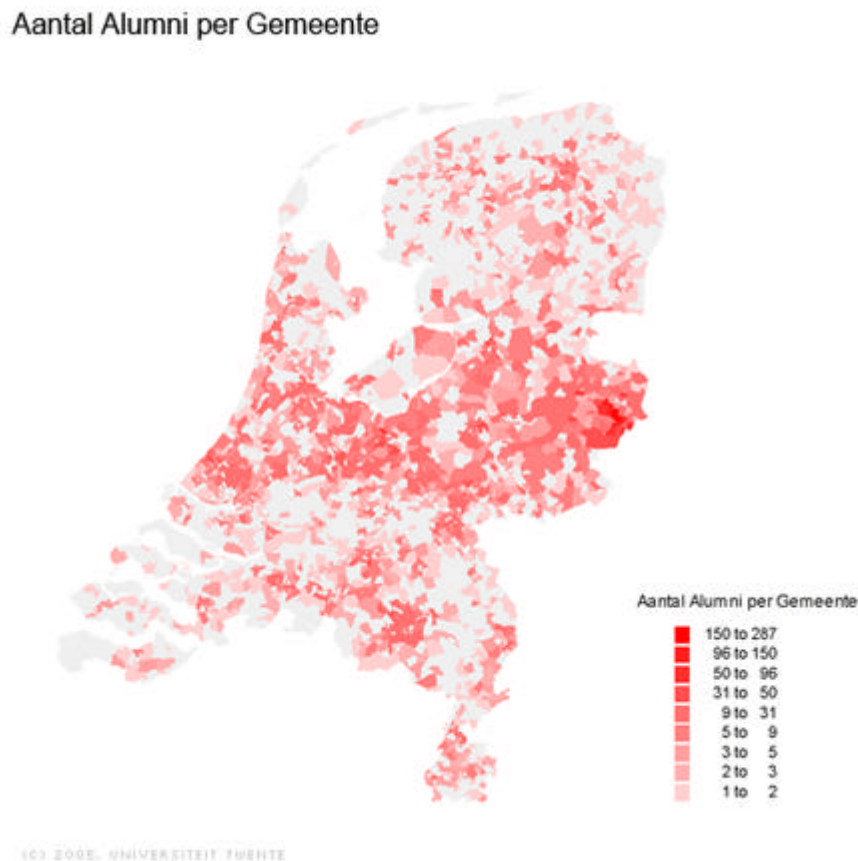


Figure 4.1 shows the place of residency of the UT's alumni. The intensity of the red colour correlates with the concentration of university graduates. The Twente region holds a relatively large number of university graduates. However, some other metropolitan areas also hold a large number of graduates from Twente.

On a decentralized level, several faculties and departments in both Saxion and the UT collect data on their alumni (see also section 4.5; alignment of curricula with demand). The quality of these analyses differs widely across departments. On a central level, on the other hand, one can say that the data generated by the UT is good and detailed. This is shown for example by the map above. While Saxion so far has not introduced its own graduate surveys, it is currently putting such a system in place. However, the graduate surveys in the Netherlands provide little information on the evaluation that employers make of the education their employees have received. There is only little information available on the question whether the quality of graduates meets employers' expectations and whether the quality differs across higher education institutions. Only through the national system of teaching quality assessments that take place every five years is that issue addressed – but in a partial way only.

³⁵ Research questions focus on the job level, the type of jobs, the relationships with the original curriculum, et cetera.

Apart from the HEIs, the regional authorities monitor the labour market situation in their region in order to inform their policies. Reports are commissioned – for instance to the Research Centre for Education and Labour Market (ROA) – to forecast the labour market in the Province of Overijssel (ROA, 2005) and the region of Twente in particular (Etil, 2003).³⁶ These reports are an effort to forecast the regional labour market by occupation and education. They sketch the general picture for the province and show the trends in labour demand for several sectors in the regional economy. Also projections are made for the outflow of graduates from the various levels of education in the province/region. From the confrontation of supply and demand the most pressing labour market needs (shortages or excess supply) follow for the various occupations and levels of schooling. Reports like these are an input in policy-making of municipalities and provinces. On the national level, such labour market analyses made for the Netherlands as a whole are an input in some of the policies aimed at ‘activating’ workers (*Raad voor Werk en Inkomen*, 2005) or informing students about the situation on the labour market in the short to long run. The extent to which educational providers use such analyses depends on the type and level of education and differs across the respective educational programmes and disciplines.

Labour market projections are important for UPEs such as ES, which educate teachers, or for Saxion when it comes to supplying graduates for the health and care sectors. ES closely monitors developments in the demand for teachers and managers in primary and secondary education. Projections for this field are made by the Ministry of Education and depend heavily on demographic trends. For the UT, labour market projects have been an input in the initiatives that focus on the setting up of a Medical School Twente, which aims to train (graduate) students to professions such as medical doctor or medical specialist (see chapter 1).³⁷

4.3.1 A lack of human capital³⁸?

In this section, an investigation will be made on the possible lack of human capital in the Twente region. Different indicators are used to have a closer look on the supposed lack of human capital in the Twente regions. These indicators are mainly quantitative and derived from secondary data. We will have a closer look on the jobs and vacancies in the Twente region; the percentage of human capital in the region; and the migrational flow of academic students and graduates. Of course, the indicators are not exhaustive. However, they can clearly show whether or not the region is facing a lack of human capital.

Human capital percentage

Another indicator for a possible lack of human capital is the percentage of human capital in the region in comparison with the Netherlands or comparable regions. In figure 4.2, the share of human capital is illustrated for Twente in comparison with six comparable NUTS-4 regions in The Netherlands. These regions are comparable in the sense that they either roughly have the same number or inhabitants³⁹ or

³⁶ ROA (2005), *RATIO II. De Overijsselse arbeidsmarkt naar opleiding en beroep 2003-2008*, Maastricht: ROA. and: E,til bv (2003), *RATIO. De Overijsselse arbeidsmarkt tot 2006. Regiorapportage Twente*. Maastricht: E,til.

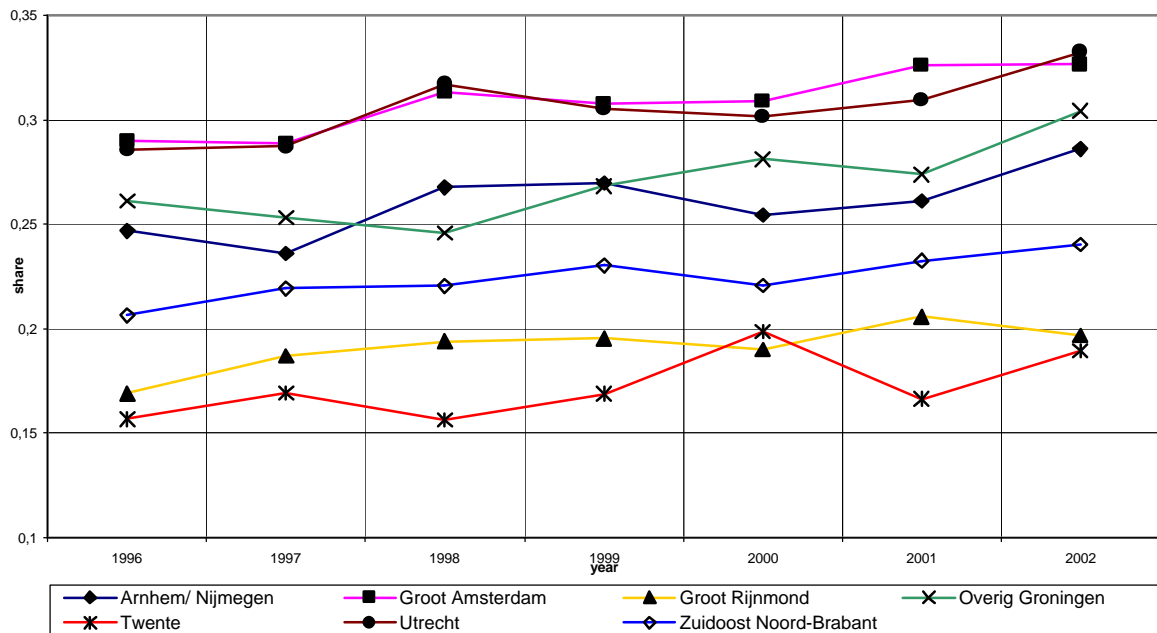
³⁷ The Medisch SpectrumTwente (MST) is one of the biggest non-academic hospitals in the Netherlands. It is located in Enschede and Oldenzaal. While not an academic hospital, it does have a substantial training function. It has 1070 beds and 3800 staff, including 180 medical specialists. MST takes care of 11 medical training programmes (including cardiology, surgery, neurology) and three specialization programmes (clinical pharmacy, clinical chemistry and clinical psychology). The hospital collaborates closely with the medical rehabilitation centre *Het Roessingh*, located in Enschede. Together with the municipality of Enschede, it is the MST, the Roessingh, various regional technological institutes and (small) businesses in the medical field, and the UT (in particular its Medical Technology department) that are cooperating in an ambitious regional initiative called *Care and Technology* to stimulate innovation and economic activity in the city of Enschede and the Twente region in general. The focus of this programme is health care and technology and the goal is to make Enschede one of the ‘hot spots’ for medical research and development in Europe.

³⁸ In this chapter, the authors operationalize human capital as having finished education at the level of either bachelor (ISCED-97 level 5a) or master (ISCED-97 level 5a) or PhD-level (ISCED-97 level 6). In the Dutch context this implies graduation at a university of professional education or a research university.

³⁹ Arnhem/ Nijmegen; Utrecht; Zuidoost Noord-Brabant

have comparable educational facilities⁴⁰, in casu a university and colleges for advanced education. It can also be because they are mentioned in the same breath as Twente in the Space Memorandum, or the related plans⁴¹.

Figure 4.2: Development of the share of human capital in 7 Dutch NUTS-4 regions (15-64y) ⁴²



Source: Statistics Netherlands

Brain drain; from the figure above, it seems clear that the Twente population is rather uneducated in comparison with populations of comparable regions.

This has remained unchanged over the last years.⁴³

4.4 Student recruitment

4.4.1 University of Twente

While the catchment areas of the UT is the Netherlands as a whole, many of its students originate from the East and to a lesser extent the North and ‘middle’ parts of the Netherlands. Table 4.1 below shows the origin of the students for the UT and two of its main competitors (the universities of Groningen and Nijmegen).

A quarter of the secondary school leavers from Twente that qualify for a university place decided to study at the UT. The university also attracts relatively many students from the rest of the province of Overijssel and the province of Gelderland (the regions 2, 3 and 4 in the table below). A relatively large part of qualified secondary school-leavers (32.4%) choose to move up north to the University of Groningen. This is mainly due to the fact that the University of Groningen is about three times the

⁴⁰ All regions mentioned

⁴¹ All regions mentioned, especially Arnhem/ Nijmegen and Zuidoost Noord-Brabant (economic key-regions, outside the Randstad area)

⁴² Source: Statistics Netherlands. One may notice a remarkable increase in Twente in the year 2000. This increase is found in other sources as well. However, related to the total amount of human capital in Twente in 1999, this is an increase of more than 17 percent. Such an increase is most probably caused by wrong measurements.

⁴³ One must notice the striking discontinuity in the 2000 Twente figures. This cannot be explained, yet it can be witnessed in multiple sources.

size of the UT and has a much broader choice of programmes compared to the UT that still is heavily oriented towards the engineering sciences.

On the subject of student recruitment it is worth mentioning that the educational providers in Twente have engaged in a co-operative effort to facilitate secondary school students in the Twente region moving on to the higher education providers in Twente. In section 4.6, under the heading of the LINX project, we will discuss the efforts to strengthen this regional education supply chain.

Table 4.1 Secondary education graduates from selected regions that chose to go to the University of Twente or some of its main competitors (2001)

Region	Percentage of a region's students that chose to study at:				number of students
	University of Twente	Groningen University	Nijmegen University	other univ.	
1. Twente	26.1%	32.4%	11.2%	30.3%	686
2. Apeldoorn & midden IJsselgebied	14.8%	24.1%	18.4%	42.7%	555
3. Zuidelijke Achterhoek	11.8%	13.5%	34.9%	39.8%	229
4. Zwolle-Meppel	10.2%	44.3%	5.6%	39.9%	537
5. Oost-Groningen	9.7%	74.5%	0.6%	15.2%	165
6. Harderwijk-Amersfoort	9.1%	8.9%	2.0%	80.0%	537
7. Assen-Hoogeveen-Emmen	8.0%	73.0%	2.1%	16.9%	374
8. Groningen	7.1%	72.9%	1.0%	19.0%	594
9. Arnhem	6.9%	11.6%	29.2%	52.3%	448
10. Friesland	5.8%	76.1%	1.0%	17.1%	607
11. Other regions (having a percentage less than 5 for the UT)					241
Number per university	787	2,405	1,415		17,084

Source: UT: Policy plan Education marketing.

4.4.2 Saxion

In contrast to the UT, Saxion's marketing and recruitment policy explicitly aims at attracting the Twente youth. This is mainly due to the difference in missions between UPEs and universities in the Netherlands. UPEs, more than research universities heavily focus on their region. As a result the majority of Saxion students originate from the Twente region.

Table 4.2 Origin of students studying at Saxion UPE: new enrolments from inside and outside the Twente region (year 2004)

Origin	Full-time		Part-time	
	Number	%	Number	%
Twente	2,067	62 %	252	54 %
Rest of Netherlands	943	28 %	80	17 %
EUREGIO	231	7 %	113	24 %
Rest of Germany	64	2 %	26	5 %
Rest of World	37	1 %	0	0 %
Total	3,342	100 %	471	100 %

Source: DOS, Saxion, 2005

We are not aware of the existence of detailed figures for the various 'schools' that exist within Saxion and therefore cannot evaluate to what extent some of Saxion's programmes are serving a particular regional demand.

4.5 Interaction between HEIs and the Twente region

4.5.1 Introduction

This section focuses on the question to what extent the HEIs from the Twente region take into account the specific demands and characteristics of their region when it comes to the contents and supply of

their educational programmes. Are regional needs or regional characteristics in some way reflected in the teaching and learning that goes on in Twente's research university or its UPEs?⁴⁴ We will address the various manifestations of interaction between Twente's higher education institutions and the region under the following subheadings:

1. alignment of curricula with demand
2. student internships
3. work-based learning
4. staff mobility
5. field trips by staff
6. supporting graduate entrepreneurs
7. continuous professional education
8. design and development activity by UPEs

4.5.2 Alignment of curricula with demand

Like for any research university in the Netherlands, the UT's educational programmes lead to a recognised (Bachelor's or Master's) degree that has a certified value on the Netherlands market and abroad. The university's degrees therefore have a value that extends beyond the region. Thus, the university's programmes are not specifically addressing regional needs. However, at the same time one may also argue that all its degree programmes meet regional needs and the very fact that a lot of students are from the region is underlining this. It is also a fact that some of its programmes are directly geared to the regional demand, either because the participants are from the region or regional enterprises, or because the curriculum contains a large amount of regional content.

As a result of the national orientation of Twente's research university, the extent to which its curricula reflect regional demand for educated labour⁴⁵ is not an issue that is on the minds of the university's programme directors and deans. That is, when it comes to Bachelor's or Master's degrees, the existing programmes do not have many regional ingredients. However, regional demand does play a part in the continuing professional training (lifelong learning) courses (in Dutch terms: the *post-initial* programmes) or modules offered (see section 4.5.8 below). Information on regional interest in courses provided by the UT does play a part when new programmes are discussed, but it is not the all-determining factor.

In the light of the economic strategy of the Twente region and that of the UT and Saxion in particular, the regional demands and ambitions were an input in the discussions to initiate a programme in Technical Medicine at the UT a few years ago. Also, recent initiatives to set up a Medical School in collaboration with the MST hospital, the Roessingh centre for rehabilitation and Saxion should be mentioned here. In this initiative, the ambition of Twente to manifest itself in the area of health and technology and the presence of some large medical institutes and high-tech businesses in this area were combined along with the interests of regional authorities and representatives from society. The university offers three programmes in this field: Biomedical Engineering, Clinical Technology and Healthcare.

In the bachelor's degree programmes offered by the UT, regional industry and (public/private) service providers are present when it comes to injecting practical elements in programmes in disciplines such as engineering, information technology, business science and public administration. Examples of practical elements are students doing 'project work' or thesis assignments to solve a real-life question. However, the regional industry's needs are supporting teaching and learning process; it is not the other way around. The same holds for guest lecturers from industry doing part of the teaching. In the master's degree programmes and to a lesser extent in its bachelor's programmes offered by the UT,

⁴⁴ For a full overview of the study programmes offered by Twente's HEIs, see appendix K

⁴⁵ Please note that when the word 'education' is substituted by 'research' we arrive at the topic of external involvement in defining the HEI's *research* agenda. This issue is addressed in chapter 3.

the curriculum is inspired by the research carried out in the university's faculties. From year one on, the programmes are progressively research-driven, so to speak.

For the UPEs in Twente, regional enrolment and participation in continuing professional training (lifelong learning) courses is a more natural phenomenon. Here we see a direct manifestation of regional interest/demand for UPE graduates. Practical assignments and exercises are an integral part of the UPEs' bachelor programmes.⁴⁶ The UPEs' curricula are defined in close communication with representatives from industry and professional organizations. Earlier, we gave the example of the Advisory Board set up by Edith Stein. In general, the alignment of curricula with the professional field is part of the accreditation requirements for a degree programme, for instance in engineering, law or medical professions.

Less formal manifestations of alignment between curricula and regional demand are contacts between lecturers and alumni. For instance, the UT is offering its alumni a lifelong (i.e. permanent) e-mail address, thus securing the means to stay in touch with its alumni. On top of that, UPEs and research universities are frequently involving external (including regional) stakeholders in some their governing structures. 'External personalities', 'laymen' or 'regents' are included in programme committees or sounding boards. For the UPEs, this interaction with stakeholders in particular addresses the attention paid to entrepreneurial attitudes and skills in the curriculum. Saxion especially aims at drawing regional stakeholders in curricular renewal. Through installing curricular renewal committees, Saxion tries to keep its curricula in contact with the regional labour market. Such committees are more common among UPEs than among research universities. For instance, Saxion offers regionally oriented bachelor programmes in Physiotherapy, Podotherapy, Nursing and a Nurse Practitioner master's course. More than the Master's programmes at the university, the Professional Master's programmes of the UPE address regional needs and incorporate regional partners. For instance, the nurse practitioner Master's programme came out of national (and regional) concerns about the shortage of professionals that could take on jobs situated in the 'middle area' between registered nurse and general practitioner. Regional demands also affect the training of managers and teachers by Edith Stein UPE. Labour market projections for Twente show a large shortage of teachers in secondary education as well as a large demand for qualified managers in primary and secondary education.⁴⁷

Educating at school, see appendix G 12

Educating at school (*Opleiden in de school*) is a four-year university route that can be accomplished in three years. The core matter is offered within the apprenticeship school (a primary level school). This means, that this school and the UPE adopt an extra responsibility through supporting this apprenticeship as a potential future job for the trainee.

Education and training in practice allow for theory and practice to better go hand in hand. The students work - in contact with fellow students, teachers and trainers - on the development of their own expertise. The shared responsibility of schools for the study ensures, on the one hand, high quality apprenticeships in the practice schools and, on the other, activities in the UPE that, more than before, focus on everyday school practice.

The number of schools prepared to cooperate as practice schools has increased to nine in the past year. Of the first student group 60 % qualified within three years and 30 % in four years – whilst 10% failed to complete. The programme would normally be expected to take students four years. This pattern of cooperation is so successful that a special project has been started with highly committed schools in Losser and Denekamp.

The Textile Technology department of the national research organization TNO is located in Enschede (see chapter 1). This department is a member of the Expertex group, a co-operation combining research and education in the field of textiles and clothing. The activities of Expertex are located in

⁴⁶ Examples: (1) 'Project Week' offered by Saxion and (2) projects carried out by students of Saxion and the UT through the Industrial Design Centre.

⁴⁷ See: Jaarverslag ('Yearly Report') 2004, Hogeschool Edith Stein (p.3).

the former *Hogere Textielschool* (textile training institute) in Enschede. Here, TNO's Textile Technology department, the textile training department of Saxion Hogeschool Enschede, and the textile training of ROC Twente Plus and ROC Oost Nederland (both vocational schools) are located. A close cooperation exists with the discipline group Textile Technology at the UT. Expertex is supported by professional organizations in the textile, carpet and clothing industry, 'De Voorzorg' Research Association and the *Overijsselse Ontwikkelings Maatschappij* (the region's development agency). An important area of interest in Expertex Research is process intensification, which aims to perform textile upgrading processes in a shorter time and at lower temperatures. Part of the research is conducted in European research programmes.

4.5.3 Student internships

The second type of interaction between educational supply and regional demand takes place through students doing internships or thesis work in a private firm or public organization in the region in order to become acquainted with their future job as a graduate. This kind of interaction takes place, first of all, by having the HEIs' lecturers supervise the student interact with representatives from the organizations that provide internships. On the one hand, this exchange of knowledge and the experience of students may feed into curricula and, on the other, offers regional businesses more insight into the educational supply of the HEIs. In this way, industry, hospitals, and public organizations like police have an impact on the offerings of HEIs while the latter on their part provide solutions to the practical problems posed by regional firms and organizations.

For the UPEs, internships are an integral part of the student's curriculum. Usually, UPE students will do an internship taking up most of the third year of the program.

At the teacher-training institute Edith Stein, the internships provided by primary and secondary schools are part of a greater package of teaching and learning experiences offered to students. Two projects in particular stand out: *Project Denekamp*, and *Opleiden in de School*.⁴⁸ For the research university, the internships and thesis work is organized less uniformly. Information on the number of months that students spend on internships or practical assignments outside of their educational institution is absent. However, examples of this type of interaction are numerous. For instance, students in programmes such as Industrial Design and Industrial Engineering at the UT from day one on have to spend time on project work as part of their training. Part of the assignments⁴⁹ is carried out in response to demands by firms, some of which are situated in the Twente region. Another example is the UT bachelor's programme *Advanced Technology*. This is a so-called 'broad bachelor' in the area of engineering, where students are also required to address a practical case. Because the programme is linked to the research of the engineering faculties, some of the practical cases are inspired by the knowledge needs of regional firms that are active in the key technology fields identified.

The directors of the UT's programmes, however, stress that they do not regard it as part of their mission to explicitly respond to regional demands. Again, the reason is that the university's programmes are supposed to be more general. To the contrary, students are often encouraged to do part of their practical assignments in firms outside the Twente region or even abroad.

⁴⁸ See appendices G12 and G 13.

⁴⁹ For instance, developing a new product or new system, sometimes along with a marketing plan.

4.5.4 Work-based learning

A third type of regional interaction deals with having part of the training of students take. The student works in an organization for part of the time and spends part of the other time in the HEI. This type of student is known as a *dual student* in the Netherlands.⁵⁰ It is comparable to sandwich students in other countries. This mode of studying is different from the part-time mode, where the student only studies for part of the year and the other part is not – or at least not explicitly – related to his/her training. Dual students earn a salary for the number of hours they work in their job. The knowledge and experience gained by the dual student feeds back into the UPE and – the other way around – the firm takes advantage of the knowledge brought in by the student and his/her supervisor.

Project Denekamp, see appendix G 13

Students of 'Education' (BE) do part of their final studies at a smaller regional branch school of secondary education (such as in Denekamp). They combine this apprenticeship with one at a primary school in a community local to the students of this secondary school. The project reflects as far as possible the concept of 'Educating in school'.

By training and educating students from within their apprenticeships, theory and practice can go hand in hand. The student operates in touch with fellow students, teachers and internal trainers of the primary /secondary school whilst developing his/her own expertise. The shared responsibility of schools for the study leads, on the one hand, to higher quality learning-working foci in school - and, on the other, to activities at the UPE relating more than before to everyday school practice.

Thus far, all participants are very enthusiastic. Students decide to link their research work during the final study year with this Lio apprenticeship. Meanwhile, a growing number of secondary schools show preparedness to participate in this project. It clearly has a positive image. Last year's result is that one student out of six failed to complete – whilst the other five qualified from this study programme with a presentation of their secondary school research project.

Table 4.3 shows the number of students, distinguished according to their mode of study. In 2004, Saxion has 14% of its students studying part-time. Most of them have a job in the Twente region. The number of dual students is relatively low – only one percent of total enrolment. For ES the corresponding figures are 17% and 3%. The UT has very few part-time students: in 2002/03 there were only 134, amounting to 2% of the total enrolment⁵¹. The demand for this mode of studying in the university is very low and, because of that, the university does not offer many part-time programmes in the bachelor's or master's phase.⁵²

Table 4.3: Students by mode of study: Saxion and Edith Stein, 1995-2004

	Edith Stein	Saxion	Edith Stein	Saxion	Edith Stein	Saxion
	Full-time		Part-time		Dual	
1995	734	8,421	50	795	0	56
1996	792	7,953	67	766	0	62
1997	813	7,874	63	800	0	77
1998	831	7,757	95	883	0	161
1999	832	8,151	120	1,049	0	202
2000	846	8,276	176	1,319	0	286
2001	856	8,731	188	1,552	0	286
2002	852	8,969	188	1,629	0	252
2003	880	9,401	210	1,678	18	178
2004	960	10,126	199	1,631	33	133

Source: HBO-raad

⁵⁰ See table 2.2 for the total number of dual students in the Netherlands.

⁵¹ Part-time courses are so far limited to *Educational Design Management and Media* and *Applied Communication Science*.

⁵² Exceptions: Master's in Psychology, Educational science, and Research in social science and some higher-level teacher training programmes (master's) offered by the university. For numbers, see table 2.1 in chapter 2.

The three-year bachelor's programme offered by the research university does not leave much room for extended periods of work-based learning. In contrast, the UPE bachelor will often last four years. Saxion UPE offers selected students that have successfully completed their bachelor training the opportunity to take part in a two-year graduate training programme. High potential students take part in a management development programme and during three periods of 8 months each they receive work-based learning in companies, public organizations and service companies in the region. The programme is called Fast Forward and involves 67 companies and has been very successful.⁵³

4.5.5 Staff mobility

Bringing in external (i.e. guest) lecturers or appointing 'outsiders' for part of the working week as a staff member in a research university or UPE may also bring about interaction with the region. The secondment of lecturers to industry or government is another – but less successful/ frequently found – example. Professors and teachers having positions on a “zero numbers of hours a week basis” are part of the research university staff. Many of them are from regional industry, banking and service organizations or health care organizations such as hospitals. Many professors in Business Science have a part-time position in the university.

The university has introduced the phenomenon of the practice professor (*Praktijkhoogleraar*), a position that does not have the right to award PhDs but that does confer other privileges and prestige to the holder. There are a small number of such positions, for instance in the fields of Civil Engineering, Management and Construction. In addition, one can mention the University Fund (*Universiteitsfonds*) that funds endowed chairs and part-time professorships. The University Fund pays the salary of 12 UT professors. It should however be mentioned that none of these chairs serve specific regional goals.

4.5.6 Field trips by staff

It is fair to say that the number of times that staff of HEIs voluntarily visits a private or public organization, for instance to monitor innovations in terms of products or working methods is low. The human resources policy of HEIs often does not provide any incentives to encourage staff paying visits to companies. Currently we do not have any information on the number of field trips by staff members. An alternative indicator might be the participation by staff in conferences and professional networks and boards. However, information on this is also absent.

4.5.7 Supporting graduate entrepreneurs

Increasingly, HEIs are paying attention to graduates that wish to start their own business. Connected to this they have set up programmes to enhance students' capacity to be enterprising. Teaching students entrepreneurial skills is becoming a part of the curriculum in some faculties. This means that, as part of their training, students do courses on becoming entrepreneurs, writing business plans or learning other skills connected to setting up and running one's own company.

The UT is profiling itself as the *Entrepreneurial University* and this image is well known across the world (Clark, 1998). It not only relates to the university's research and the way in which it tries to

IEBD, see appendix G 21

“Innovative Entrepreneurship and Business Development” is a one-year Master programme on Entrepreneurship and Business Development. Goal to be achieved is to recognize the opportunity of the innovation earlier than others, and, consequently, create new business upon this opportunity. The recognition and assessment of opportunities, the development of business concepts and their implementation is the basic process under study. Therefore, this programme provides the students with:

- Competencies to work in an entrepreneurial context
- Knowledge of entrepreneurship as a scientific field
- A network of innovative companies and entrepreneurs
- The opportunity to develop their own enterprise

The programme is open to all students who have completed the pre-master programme. This year fifteen students take part in this programme.

⁵³ See appendix G5.

commercialise the research findings, but it also extends to its curriculum and the activities of the Student Union. In the context of its Major-Minor model⁵⁴ introduced at the end of the 1990s, the UT offers an ‘Entrepreneurship Minor’ and elective courses in the area of business development. The interest of students and even representatives from local firms has proven to be quite high, with many entrepreneurs taking part in the programme. The goal of the minor is to stimulate and develop an entrepreneurial and innovative attitude within students and UT-related entrepreneurs. In addition, the minor aims to develop academic knowledge on knowledge-intensive entrepreneurship. The programme consists of academic and practical courses. Some students have a specific idea or plan about starting a business idea or company. The module concludes with one out of two courses: “Becoming an Entrepreneur” or “Managing an SME”. In the former, drawing up a realistic business plan is the ultimate goal. External speakers and trainers from the business world take part as lecturers in the course. Both courses provide a link between practical entrepreneurial experience and theoretical knowledge of entrepreneurship. This year, the minor Entrepreneurship is entering its sixth year. Over the past five years some 100 students successfully completed the programme.

A successful example of supporting graduates to become entrepreneurial is the ‘Small business growth programme’ offered by TSM Business School. This is a postgraduate programme offered to professionals such as managers and directors from the business world. Participants are asked to write a business plan. An experienced student from UT or Saxion assists them.⁵⁵

Saxion offers a four-year bachelor programme Small Business and Retail Management, aimed at training entrepreneurs and entrepreneurial managers. Using innovative teaching and learning approaches, students acquire the various skills and competencies required to start their own company, work in SME or to function as entrepreneurial managers in large-scale industries and/or multinational companies. In the context of its Major-Minor model⁵⁶ Saxion also offers an ‘Entrepreneurship Minor’ and elective courses.

The *Student Union* is another addition to the entrepreneurial character of the UT. It is the only organization of its kind in the Netherlands. It encompasses all of the university’s students and student organizations in the fields of culture, social activity, sports, study, and other activities. It was founded in 1999. About 6000 students and 90 student organizations are affiliated with the Student Union. It is presented as a Best practice in this report because it is specifically aimed at stimulating student activism, that is students learning other skills and competencies – outside of their education programme. Skills that matter in professional life and graduate careers and that are recognised in a so-called digital

Student Union, see appendix G 25

The Student Union is a student lead umbrella organization for all the student organisations at the University of Twente. The union is responsible for every extra-curricular activity that takes place at the university. Therefore, it has to deal with 6,000 individual students. Besides, it manages three buildings that are solely intended for use by students: the Water Sport Complex and the “Pakkerij” and the “Bastille”.

Bachelor programme Small Business and Retail Management, see appendix G 15

Small Business & Retail Management” is a four-year undergraduate curriculum, aimed at the training of entrepreneurs and entrepreneurial managers.

The programme is based on entrepreneurial competences, defined in close collaboration with entrepreneurs. The method, therefore, is competence-based and practice-oriented. The problem-solving approach can thus be characterised as Problem Solving Entrepreneurial Learning. Development is tested by a series of individual assessments and recorded in a portfolio, where students gather proof of their entrepreneurial development.

Since the start in 1999, 450 students have graduated. At present, more than seven hundred students are on their way to achieving this as well.

⁵⁴ Students, as part of their training in a particular disciplinary field (their ‘major’) are given the freedom to earn part of their credits outside of this field (the ‘minor’).

⁵⁵ See appendix G3.

⁵⁶ Students, as part of their training in a particular disciplinary field (their ‘major’) are given the freedom to earn part of their credits outside of this field (the ‘minor’).

portfolio that next to the university diploma can become a valuable part in the student's curriculum vitae. With the help of regional business (banks, consultancy firms, etc), some of them regional firms, the Student Union organizes training programmes to students that have a management role in their student organization. The entrepreneurial character of the Student Union also derives from the fact that it runs its own Union buildings and offers facilities and other support to students that run their own business as a student entrepreneur. The latter takes place through USE, University Student Enterprises. USE is part of the Student Union and may be regarded as the students' counterpart to the successful TOP programme that offers credit and other support to graduates and university employees starting their own business (see chapter 3).

The UT and Saxion also contribute to graduate entrepreneurship by organising special days during which a number of companies can present themselves to students. These 'company days' give an opportunity to students and companies not just to engage in closer contacts, but also to offer students ideas and training about starting their own company.

4.5.8 Continuous professional education

Contributing to regional development can also take place by postgraduate education aimed at individuals in the region that already have a job but seek additional training. Next to the regular educational provisions for 'traditional students', Twente's HEIs are also engaged in specially designed programmes, or programmes supplied 'on demand' through contract education and other forms of continuous professional education. This post-initial supply of educational programmes is a rather heterogeneous mix of activities. Initiatives are underway to increase the transparency of the CPE (Continuous Professional Education) supply and its relationship to initial education.

Appendix A presents some facts and figures for the HEIs. The data relates to the number of students enrolled in MBA-type programmes, short courses, and in-company training. From the table it is clear that in the spectrum of courses offered to professionals that seek additional training most offerings are concentrated on business administration and management programmes. However, most HEIs are also able to operate flexibly when a demand for a particular course arises. For instance a professional organization such as the one for physiotherapists can request on behalf of its members to have Saxion organize refresher courses or upgrading programmes.

What the table does not show is the option of taking a scientific master's degree education in the university or a professional master's degree at a UPE. This option is available to holders of a bachelor's degree or graduates that already have a master's or equivalent. Also the minor programmes (mentioned earlier) offered to the HEIs' regular students are open to 'outsiders'. This takes place through the transfer offices of the HEIs and individual departments or faculties.

Like other regions and cities, Twente has a large variety of private training establishments that offer training courses to individuals interested in continuous professional education. TSM Business School and SWOT are examples of initiatives set up from within the publicly funded HEIs. Today, TSM is part of the university again, after a period in which it had a more independent status. Some of the management courses offered by TSM and SWOT have already been mentioned. The Faculty of Business, Public Administration and Technology of the UT has established the *Centre for Education in Public Administration* (in Dutch: *Centrum voor Bestuurskundig Onderwijs, CBO*). It offers post-initial education and tailor-made in-company programmes for public organizations, municipalities, provinces, et cetera. An example is the two-year Master of Public Management (see appendix K) for managers and experienced professionals in the public sector.

Other short courses offered by the University are in fields like computer science, chemical technology and educational science. Post-initial training is offered in computer programming, polymer (or rubber) technology. The institute ELAN, part of the UT, is a centre of expertise for secondary education, offering teacher training to holders of Master's degrees and a large number of courses to secondary school teachers that wish to upgrade their skills or acquire particular competencies.

4.5.9 Design and development activity by UPEs

Again connected to the issue of encouraging entrepreneurialism – in particular in the UPEs – is the attention paid to applied research. The research activities carried out by the UPEs are mostly in the field of design and development (D&D). D&D activities differentiate the UPEs from research universities, where research is still heavily focused on advancing scholarship. The design and development of knowledge products that have a direct application in practice, such as physical products, production methods, advisory services, methods, manuals, is increasingly becoming part of the variety of services produced by the HEIs. Design and development can also help professional practice. In both the research universities and the UPEs, students that are in the final stages of their educational programmes and that are working on a thesis are frequently working on assignments in private businesses and public organizations. These assignments lie close to the research carried out in the university. This applied research is also encountered in UPEs. Through this activity, the academics supervising the assignments come in contact with practical and professional situations – some of which are located in the region.

Under the heading of applied research and design & development activity by UPEs one should mention the function of *lector*. The *lector* position was introduced in UPEs in 2001 in order to have UPEs contribute more to knowledge transfer and regional innovation. The other goal was to create more opportunities for UPE staff to make job promotion and raise the general level of the academics working in UPEs. The *lector* position is a senior staff position in the UPE and the UPE equivalent to the associate professorship in the research university. Government subsidies were made available to create around a hundred *lector* positions in UPEs throughout the country. Currently there are some 200 *lectors* in the UPEs. The *lector* is required to build a so-called *knowledge circle* of professionals from within the UPE and the regional business sector (in particular from SMEs). He/she is expected to work on stimulating the external orientation of the UPE in the *lector's* particular area of expertise, engage in innovating the curriculum, staff development of teachers and stimulating knowledge transfer between the UPE and its environment. Recent evaluations of the *lector*-ships provided evidence of very modest successes in these areas. However, the government recently decided to continue the *lector* experiment through its Knowledge Development Foundation for Higher Vocational Education (*Stichting Kennisontwikkeling HBO – SKO*).

Saxion has 10 *lectors* in its Enschede location. They cover the following knowledge fields:

- Assessment
- Sustainable energy
- Physiotherapy
- Industrial design
- Knowledge intensive entrepreneurship
- Media Technology Design
- Risk management
- Software engineering for real-time and embedded systems
- Strategic management
- Care and well-being

Edith Stein has two *lector* positions; they cover the knowledge fields:

- E-Learning
- Implementation of Educational Innovations

AKI has one *lector* in the knowledge field of “Artistic research and media theory”.

In Chapter 3, the *lector* and knowledge circles are discussed more extensively. We should stress that the *lector*-ship is still very much ‘under construction’ in the Dutch UPEs. Debates on the funding of design and development activity in UPEs, its quality assessment and evaluations of the functioning of *lectors* are still going on.

4.6 Other mechanisms to promote the regional knowledge infrastructure

4.6.1 Enhancing the regional education supply chain

To encourage the flow of students from secondary education to higher education, all HEIs and secondary schools in Twente have started to work on finding ways to enhance the regional educational supply chain. The most prominent initiative in this respect is the so-called LinX-network. The goal of the LinX network is the realization of uninterrupted educational routes in general – from lower vocational education, through intermediate vocational education, to the UPEs in the Twente region. LinX connects all secondary and tertiary education institutes in Twente with the aim to optimize the study career of young adults and create training conditions for qualified students. It offers learning pathways and study-career activities. Workshops are organized for teachers, project managers, managers and career coaches. Plans for a so-called inter-institute (the LinX College) have recently been approved. Currently, more than 400 pupils take part and almost every course in secondary professional education has an integrated pathway leading to higher professional education.

4.6.2 Satellite campuses, ICT-based provision and outreach centres

Another initiative that contributes to the region's knowledge infrastructure is the existence of on-line education providers or branches of providers that have their main offices elsewhere. The UT has an auxiliary branch in the northern city of Franeker in the province of Friesland. This annex, the Carthesius Institute, is a centre of expertise on sustainable innovation. The institute is part of the Centre for Clean Technology and Environmental Policy (CSTM) of the UT. The Cartesius Institute provides research and consultancy services and offers educational programmes for national and international students, and professionals. The Cartesius Institute is relatively small. Only seven people work in the Franeker office. The University recently decided to terminate its branch in the city of Leeuwarden (160 kilometres from Enschede). Neither the Leeuwarden branch nor the Franeker one serves specific regional goals for the Twente region.

LinX, see appendix G 9

LinX, established in 1996, is a platform for regional policy on exchanging educational and professional careers. It connects all secondary and tertiary education institutes in Twente in order to streamline the throughput of students in the educational pipeline and optimise the educational careers of young adults. LinX supervises all existing and potential projects and activities arising from study careers, and creates educational conditions around them.

The directors or members of the board of the partner institutions meet under the auspices of LinX to communicate exchange and coordinate the above activities. Turbulent change in secondary and tertiary schools drives an urgent need to communicate, arrange and re-arrange the learning routes as amongst the various levels. Conferences for teachers, project leaders, managers and career coaches are being organised, projects evaluated and new plans developed. Plans for a so-called inter-institute (the LinX College) to structure all activities for students, teachers and managers have been approved recently. Currently, over four hundred and fifty pupils follow educational career programmes each year in the institutes for higher education, whilst almost every course in secondary professional education has an integrated pre-university route. Every year also some forty 'problem' students are successful in secondary and tertiary schools. Furthermore, there is sound mutual information exchange and understanding between managers and teachers. The problem of a good connection is a shared problem with shared ownership.

Another mechanism for flexible educational provision is the provision of courses through the Internet. The UT, like the other Dutch research universities and the Dutch UPEs, does not offer full-blown on-line courses through the Internet. Nevertheless, the Internet is used intensively in most courses. Through the so-called Teletop system, many facilities are offered to students over the Internet, allowing self-paced study to students. In this, the UT takes on a leading role in the Netherlands. Through this ICT-based system, university teachers can design websites for their courses. All websites have similar layouts and structures. The Teletop system is restricted to UT teachers and its students. The system therefore does not offer educational opportunities to a wider group of people in the specific region. The virtual forms of educational provision are entirely placed on top of the traditional place-based forms that already exist. This implies there are no tensions between the virtual

and real life forms of educational provision. The virtual forms of educational provision are entirely placed in the service of the already existing place-based forms.

4.6.3 Bachelor-Master and its consequences

A few years ago, the 'bama' system was implemented in the Netherlands. This system opens the way for flexible educational routes, especially between research universities and UPEs. Numerous switching possibilities between the two are coming into existence. From a bachelor at one research university it is possible to change to a bachelor or a master at another university. Also switches from research university to UPE and vice versa are to become more easy. For this purpose, the UT collaborates with Saxion in so-called bridging courses, or special *minor* programmes. Students with a bachelor's degree from Saxion that wish to study at the UT are given the opportunity to make preparations for this transfer during their last years at Saxion. This offers students straight access to the following university masters:

- Business administration;
- European Studies;
- Health Sciences;
- Industrial Engineering and Management; and
- Public Administration.

In the opposite direction, there are mechanisms in place for UT students that wish to transfer to a UPE.

Similar agreements have been made between UT and Edith Stein, and Saxion and ITC. Both pathways are easily accessible. This is mainly due to universal use of the ECTS credit system. Dutch universities and UPEs nowadays use the European Credit Transfer System (ECTS).

Data from the Association of Universities in the Netherlands show that in the past a relatively large part of students of the UT graduated at the UPEs in the region. This percentage is relatively unique in the Netherlands and indicates a successful collaboration between the UT and the UPEs in the Twente region. This cooperation contributes to the flow of students between the HEIs in Twente.

4.6.4 Mechanisms to monitor and accredit extra-curricular activities

An important mechanism through which students can have their extra-curricular activities accredited is the phenomenon of the individual learning pathway (*'persoonlijke leerweg'*) offered in the UPEs. Here, students are challenged to add particular components to their preferred programme. An example is the dual learning possibilities offered by the UPE, where students integrate learning on the job with learning in the UPE. This kind of learning mode is part of a wider set of developments that point into the direction of a more individualized approach to education that combines the supply of HEIs with credits earned in prior learning (recognition and assessment of prior learning).

The HEIs stimulate extra-curricular activity by offering compensation mechanisms to several students' organizations and individual students. Through these grants, students are compensated for any delays they may experience in earning their degree. Students receiving these grants are participating actively in students' unions, sports clubs, cultural organizations, et cetera.

The UT's Student Union in particular was set up to encourage the extra-curricular activities of students. Its role is to encourage students to actively take part in academic life and engage in social and cultural activities. The Student Union of the UT is responsible for every extra-curricular activity that takes place at the university.

Studium Generale at both the UT and some UPEs offers other activities that students can engage in outside of their regular curriculum. It organizes debates and seminars for students and the general public. Activities are based around particular topics and themes and have a scientific content. Students can earn credits by taking part in some of the activities but they do have to get permission first from a programme or exam committee. The same holds for voluntary work taken up by students.

4.7 Conclusions

In general, we may conclude that regional needs lie close to the heart of the teaching activities in two out of the three UPEs in Twente – that is: Saxion and Edith Stein. Also the SWOT business school has strong linkages to regional entrepreneurs. Examples of interaction have been presented in this chapter, ranging from the practical work (e.g. internships) students are carrying out as part of their training, to the supply of postgraduate education (including continuous professional learning) to regional entrepreneurs (and potential entrepreneurs). The UT, like all other Dutch universities, plays a more nationally-oriented role in its education/training activities and a national/international role in its research. This holds even stronger for the institute ITC, where education focuses in particular on students recruited from abroad.

Regional needs therefore are finding their way into the teaching and learning at the UPEs and (to a lesser extent) the university. The curriculum is often inspired or at the least enriched by the injection of practical cases and knowledge located in firms from the greater region of Twente. Students doing internships or doing their thesis work in private and public organizations interact with local organizations and contribute to the idea of knowledge circulation discussed in chapters 2 and 3. Trainers or lecturers from outside of the university over the years have become a regular feature of the university curricula.

We are summarizing this chapter by means of the SWOT matrix presented below. Important steps have been taken and progress has been made, but there is certainly more room for collaboration between the different HE institutions and between the HEIs and regional industry. There clearly is potential to increase the contribution Twente's HEIs can make to their region, judging from the Best Practices mentioned in this chapter, the present situation in Twente and the route that Twente's HEIs together with their regional stakeholders have set out for the future.

<p>Strengths</p> <ol style="list-style-type: none"> 1. High quality programmes, as evidenced in teaching quality assessments 2. Regional innovation potential in selected areas (health, technology) 3. Strong linkages between Saxion and regional industry 4. Internationally renowned 'entrepreneurial character' of UT 5. Highly developed monitoring system of alumni and potential students by UT 6. UT's Student Union incorporates entrepreneurial spirit in students, involving regional players 7. Linx network (see BP) links up a multitude of regional education providers 	<p>Weaknesses</p> <ol style="list-style-type: none"> 1. Barriers still exist between SME and higher education (information gaps, accessibility problems, cultural differences) 2. Human resources policy of university does not reward regional activity by staff members 3. Most linkages are initiated, managed and monitored only on a decentralised level in HE institutes – commitment by Board is small 4. Twente's economic climate and performance is mediocre relative to other Dutch regions 5. Three-year Bachelor programme in research university leaves little room for internships 6. Two business schools (TSM, SWOT) plus post-initial management education by university and UPEs make for an intransparent supply 7. Technical (engineering) character of UT makes some potential students turn to other regions
<p>Opportunities</p> <ol style="list-style-type: none"> 1. Movement towards more knowledge-intensive economic activity in Twente Triple-helix like partnerships require multidisciplinary and public-private interactions between industry & region 2. Introduction of Bachelor-Master structure requires rethinking of curricula, competencies and links with region 3. Broad regional support and plans exist to push Twente forward in selected fields (e.g. health care) 	<p>Threats</p> <ol style="list-style-type: none"> 1. Competition (instead of cooperation) between Twente's HE providers 2. Competition from other regions in the Netherlands that have more actively and visibly integrated the provision of HE programmes by their UPEs and research universities 3. Drive towards excellence makes research university (UT) drift away from region towards international playing field 4. Lack of success indicators for regional

<p>and technology), requiring education's input</p> <p>4. New lectors ('knowledge circles') in UPEs have to focus on interaction with region (& its SMEs)</p> <p>5. Individualization in society will encourage HEIs to enable work-based learning and individual learning pathways (funded by student vouchers)</p> <p>6. Future will see more easy integration (merger?) of higher vocational education and university education</p> <p>7. Possible extension of regional activity to Germany's border (EUREGIO) region</p>	<p>interaction, combined with lack of (public) money will make HEIs pay little attention to regional needs</p> <p>5. Globalization and international competition can make large high-tech firms decide to move abroad or acquire their teaching from in-house (or non-regional) providers</p>
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