Please cite this paper as:

City of Rotterdam Regional Steering Committee (2009), "The City of Rotterdam, The Netherlands: Self-Evaluation Report", *OECD Reviews of Higher Education in Regional and City Development*, IMHE, *http://www.oecd.org/edu/imhe/regionaldevelopment*

OECD Reviews of Higher Education in Regional and City Development

The City of Rotterdam, The Netherlands

SELF-EVALUATION REPORT

City of Rotterdams Regional Steering Committee

Directorate for Education

Programme on Institutional Management in Higher Education (IMHE)

This report was prepared by Economic Development Board Rotterdam (EDBR) in collaboration with a number of higher education institutions in Rotterdam as an input to the OECD Review of Higher Education in Regional and City Development. It was prepared in response to guidelines provided by the OECD to all participating regions. The guidelines encouraged constructive and critical evaluation of the policies, practices and strategies in HEIs' regional engagement. The opinions expressed are not necessarily those of the EDBR, the OECD or its Member countries.

CONTENTS

LIST OF TABLES AND FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

- ACTP (Academic Centre transport)
- AWT (Advisory Council for Science and Technology Policy)
- BMG (Health Policy and Management)
- Broad-based Schools (Brede scholen)
- Care Portal (Zorgportal)
- CNV (National Federation of Christian Trade Unions);
- COS (the Consultative Committee of Sector Councils for Research and Development)
- CPB (Netherlands Bureau for Economic Policy Analysis)
- EDBR (Economic Development Board Rotterdam)
- Erasmus MC (Erasmus Medical Centre)
- EUR (Erasmus University Rotterdam)
- FNV (Federation of Dutch Labour Unions)
- HO Kamer (Higher Education Consultative Committee)
- HPE (Higher Professional Secondary Education) (HBO)
- HPE-raad (Netherlands Association of Universities of Applied Sciences)
- IJS (individualised junior general secondary education)(IVO)
- Innovation Platform
- KNAW (Royal Dutch Academy of Sciences)
- KNAW (Royal Netherlands Academy for Arts and Sciences)
- LTO-Nederland (Dutch Organisation for Agriculture and Horticulture)
- Ministry of Agriculture, Nature and Food Quality (LNV)
- Ministry of Economic Affairs (EZ)
- Ministry of Education, Culture and Science (OCW)
- Ministry of Transport, Public Works and Water Management (VWS)
- MKB Nederland (Royal Association MKB Nederland, representing the SME sector)
- NWO (Netherlands Organisation for Scientific Research)
- OBR (Rotterdam Development Company)
- PIC (Port and Industrial Complex) (HIC)
- R&D (Research and Development)
- RAAK (subsidies)
- Rathenau Institute (Organisation that studies the societal implications of science and technology)
- Rotterdam South Pact (Pact op Zuid)
- Rotterdam South Pot of Gold (Pot met goud op Zuid)
- SCP (Social and Cultural Planning Office)
- SCQ project (self-concept questionnaire)
- SenterNovem (agency of the ministry of Economic Affairs that aims to promote sustainable development and innovation)
- SER (Social and Economic Council of the Netherlands)
- SKO (special foundation for funding UAS)
- SME (Small and Medium-sized Enterprises) (MKB)
- SoFoKleS (Social Fund for the Knowledge Sector)
- STC (Process Technology and Maintenance)
- Studentenkamer (the Student Chamber)
- STW (the Technology Foundation)

- SVE (Senior Secondary Vocational Education) (MBO)
- Syntens (innovation platform which aims to promote interaction between SME and HEIs)
- TNO (Netherlands Organisation for Applied Scientific Research)
- UAS (University of Applied Sciences) – level is HPE
- UE (University Education) (WO)
- VNO-NCW (the Confederation of Netherlands Industry and Employers)
- VSNU (Netherlands Association of Universities)
- WRR (Scientific Council for Government Policy)
- Young North (Jonge Noorden)
- Zestor (Labour Market and Educational Fund for the HPE sector)
- ZonMw (Netherlands Organisation for Health Research and Development)

EXECUTIVE SUMMARY

The city region of Rotterdam, amongst 14 other city regions in the world, participates in the second round of self evaluation and peer review of the knowledge & research community by the OECD. In recent years one can see knowledge and innovation regions emerge throughout the world, and these are of utmost importance for the future of these regions, and Rotterdam is to be one of them, with a focus on innovations in new energy, climate change, clean tech as well as societal innovation. The Economic Development Board Rotterdam has laid the first brick in the road to knowledge region with the establishment of the working group on the relation between city and higher education. For this working group this OECD review came at a very convenient time. It is a means to take the next step in the regional cooperation on this issue.

Regional cooperation between higher education institutes, the municipality of Rotterdam and their stakeholders is an important means to achieve societal, educational and economic targets. From the conclusions and SWOT-analyses in this self-evaluation report it is clear that regional cooperation in the city region of Rotterdam leaves room for improvement. At the moment regional cooperation is often fragmented and not well-structured, although in specific cases there are successful examples of regional cooperation.

From the SWOT analysis it is clear that incentives for regional cooperation seem to be missing. Funding mechanisms of the institutions involved are not targeted at enhancing cooperative structures at regional level. Aside from that, the regional market for higher education appears to be largely segmented and is characterised as complex. Moreover, stakeholders involved do not experience concrete incentives to cooperate with each other. What appears to be lacking is a common sense of urgency for action. Also a structure for sustainable partnerships is not available.

At the same time there appears to be willingness among the involved stakeholders to cooperate on a mutual shared interest in themes that have a specific importance for the region. In this self-evaluation report various examples of this cooperation are presented. Taking this willingness as given and needed there appears to be a serious need for a structure to initiate and coordinate regional cooperation.

To a certain degree the High Education Institutions are now seeing each other as competitors on the market for students and research, whereas it is clear that to a large degree their education supply is complementary to one another. This should be exploited from a cooperative perspective. In particular this should be done around the themes that have come out of the SWOT-analyses in the end of each chapter. Before that the socioeconomic structure and the education system of the region in a national context have been described in the chapters 1 and 2.

For the theme of regional innovation (chapter 3) the following topics were brought forward:

- The creation of a strategic innovation agenda;
- An impulse towards clustering and developing science parks;
- Enhancing the interaction between the triple helix partners;

- Fine-tuning education in relation to the present clusters;
- Facilitating and promoting (market-related) research;

Regarding the labour market (chapter 4) issues were mentioned like:
- Attracting and retaining students and graduates, e.g by an active alumni policy
- Attention for the development of highly talented youngsters from ethnic minorities
- Improving the role of Higher Education in lifelong learning

Regarding social. cultural and environmental development (chapter 5) issues mentioned were:
- care, sustainability, diversity and creativity and generating (inter)national
- increasing (social and multicultural) entrepreneurship
- community formation;
- demand for multidisciplinary approach.

In the chapters 6 and 7 the issue of the regional cooperation is analyzed. There should be an adequate infrastructure of services, education and knowledge. A broad package and intensive cooperation is an advantage for the region. This region can vary per sector. The self-evaluation deals with the cooperation within the three clusters, the harbour industry complex, the medical sector and care and the creative industries. These categories are too broad. A more narrow definition of sectors within the clusters is needed. When the theme is too broad, the risk exists that too little initiatives are being taken. An international level of cooperation is one step ahead. Before that the region should do the coordination first, especially between the knowledge institutions themselves. There should be no 'bad' competition. Institutions have to exchange their research or education when there is more or better capacity with their regional neighbours. The sense of urgency in the cooperation between the universities and the universities of applied sciences is important.

PRE-FACE

It is with pleasure that I present this self evaluation of the Rotterdam region on the effect of ”Higher education in regional and city development”. In recent years knowledge and innovation regions have emerged throughout the world, bringing jobs, profit, reputation and other benefits to all the stakeholders in those regions. The ambition of Rotterdam is to be amongst the best of them, with a focus on innovations in key clean tech, medical and creative sectors, as well as societal innovation. In order to be successful we need in my view a thriving open community consisting of universities/knowledge institutes, companies and government as part of an open innovation system.

To identify ways to further develop the relation between city, business and higher education the Economic Development Board of Rotterdam installed a working group on this topic. Mr. Jan Willem Oosterwijk, president of the Erasmus University, acted from the start as an inspiring chairman. It was a shock to us all to hear that we had to go on without him, as a result of his health situation. Without him we never would have advanced so far. It was his idea and proposal to join the OECD review. We wish him well.

For our working group the OECD review came just at the right time. It has enabled us to identify our strengths and weaknesses and identify opportunities for our region, which is competing internationally and is more and more dependent on knowledge and talent development and innovation implementation. The self evaluation process we designed and executed has definitely brought many people involved closer together. I would like to take the opportunity here to thank everybody for their time and efforts up till now.

The next step is to focus and build a joint agenda for the coming years. For this we need a common vision (including priorities) and to strengthen the partnership between our business community, municipal government and knowledge/higher education institutions. This self evaluation has laid the foundation for both and we look forward to the peer review to challenge our views. I expect that the advice and conclusions from this self evaluation and review will enable us to make a step change, strongly supporting the economic strength of the Rotterdam region.

MARCO WAAS

Chairman of Rotterdams Regional Steering Committee

1 OVERVIEW OF THE REGION

1.1.1 Location

Rotterdam and Delft are situated in the Province of Zuid-Holland. This area in the west of the country is quite densely populated with 3,5 million inhabitants in 2008. Rotterdam is the 2nd largest city after Amsterdam with 580.000 inhabitants, while Delft is much smaller with almost 100.000 inhabitants. Both towns are part of the so-called "Randstad area", or the economic centre of The Netherlands.

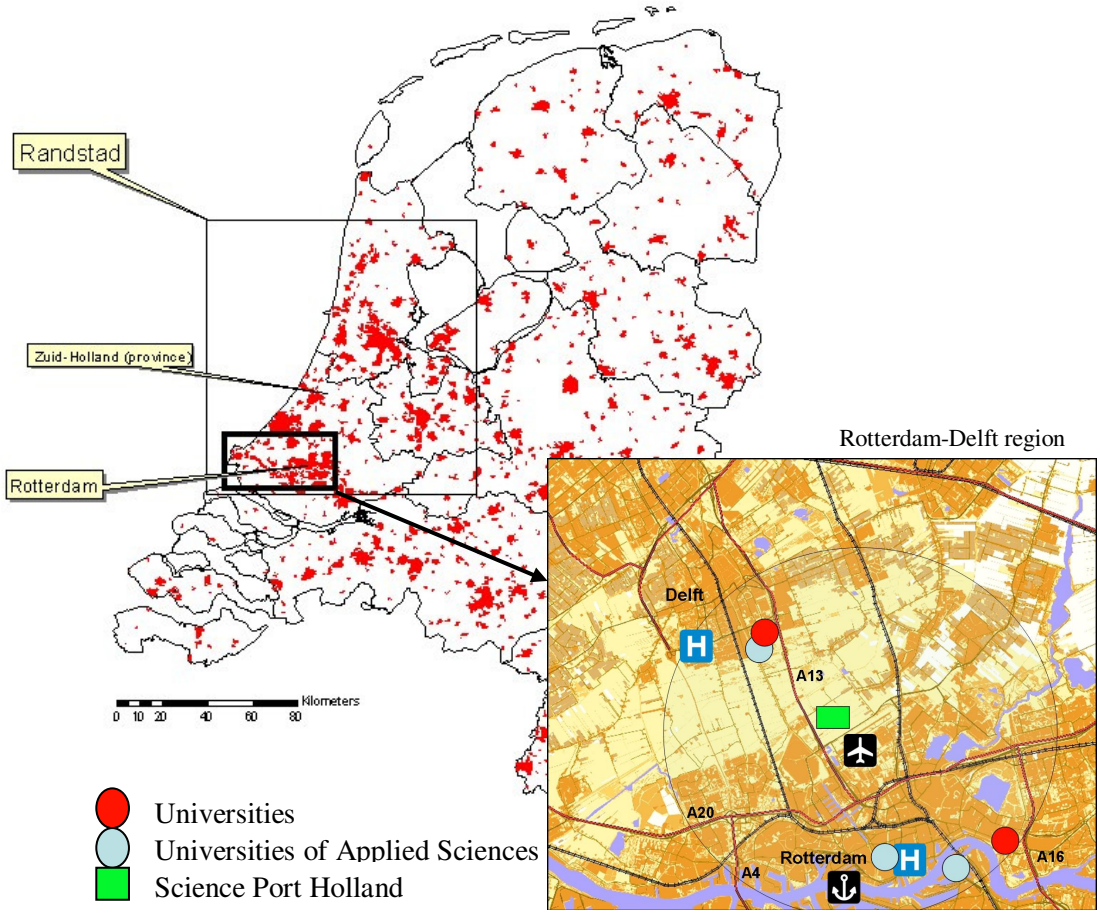
The location of both towns is favourable in several ways. They are well connected to the Randstad and hinterland by road, rail and inland waterway. There are highways to the other major cities of the country, being Amsterdam, Utrecht and The Hague. Furthermore, an efficient rail network is provided and used with high intensity. Recently, it became possible to opt for a high speed train connecting Rotterdam with Amsterdam and Schiphol Airport. This particular network will be extended to reach Breda, Antwerp, Brussels and Paris by the end of 2010. International destinations can also be reached from the seaport, the River Maas and the airport of Rotterdam.

Rotterdam, in particular, is strategically located in close proximity to the North Sea, which is one of the reasons why it is often referred to as the 'Gateway'[1] to Europe. Rotterdam is a large city with a well-equipped port infrastructure, multi-modal accessibility and considerable volumes of goods and passengers. Delft is known as the 'Knowledge city' as it is part of the important knowledge and innovation corridor, Science Port Holland. A Technological and Innovative Complex is currently being developed in Delft.

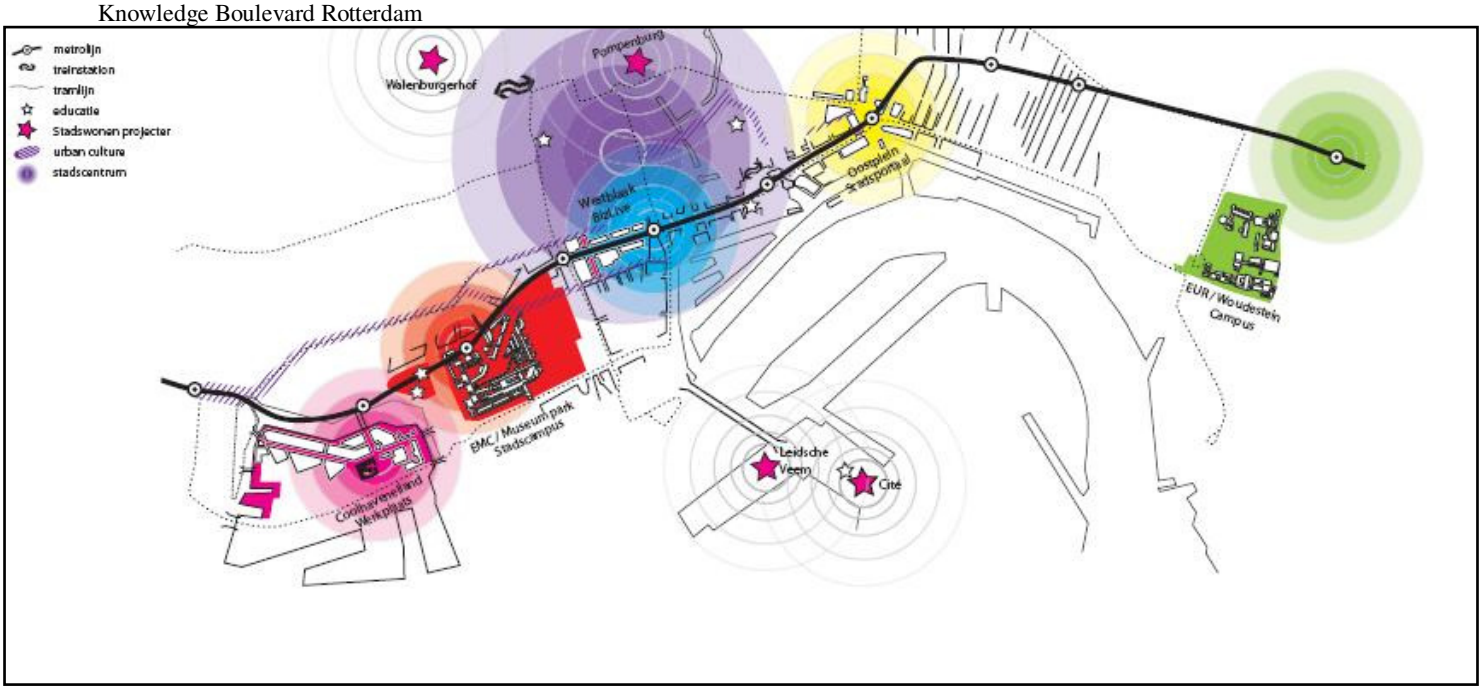
Both cities are home to a university (Erasmus University in Rotterdam and Delft University of Technology (TU Delft)), which are located in limited distance from one another, as well as several universities of applied sciences (two are presented in figure 1.1). The figure below shows the location of the cities and knowledge institutes, surrounded by a circle, of which the radius is about 8km.

[1] ECORYS (2007) The State of European Cities: adding value to the European Audit (for EC, DG Regio)

Figure 1.1 Location of Rotterdam and Delft, within the Randstad and the province of Zuid-Holland



Knowledge Boulevard Rotterdam



Definition of "the area" for the purpose of this review: In this chapter and the following, the area is geographically limited to the city of Rotterdam. However, when education and linkages between institutions and region are mentioned, the area of study is extended to include TU Delft. Considering that the influence of the Higher Education Institutions can be felt in the wider region,. That is why we opted for a flexible and pragmatic approach to extent the area of study, depending on the topic at hand.

1.1.2 Network hierarchy

International rankings generally compare Rotterdam to other port cities in the Hamburg- Le Havre range. Apart from those, Gothenburg, Marseille and Barcelona are used for this purpose.

The Randstad area scores 5th in a worldwide comparison to its main competitors in terms of international business connections. Within European networks, Rotterdam enters on a 29th position, which is a higher position than its direct competitor Antwerp but not than Hamburg[2]. A study[3] constructed a hierarchy of Dutch municipalities based on their economic performance. According to the results of this study, Rotterdam also performed well on the national scale between 1998 and 2003. However, since then, Rotterdam dropped from a 20th position to position 53 in 2007, which is similar to the position of Delft's economic performance (dropped from position 57 to position 214 in 2007).

Both towns do better when scored on knowledge intensity. A selection of this list is presented below.

Table 1.1 Selection of municipalities scored on knowledge intensity in 2007

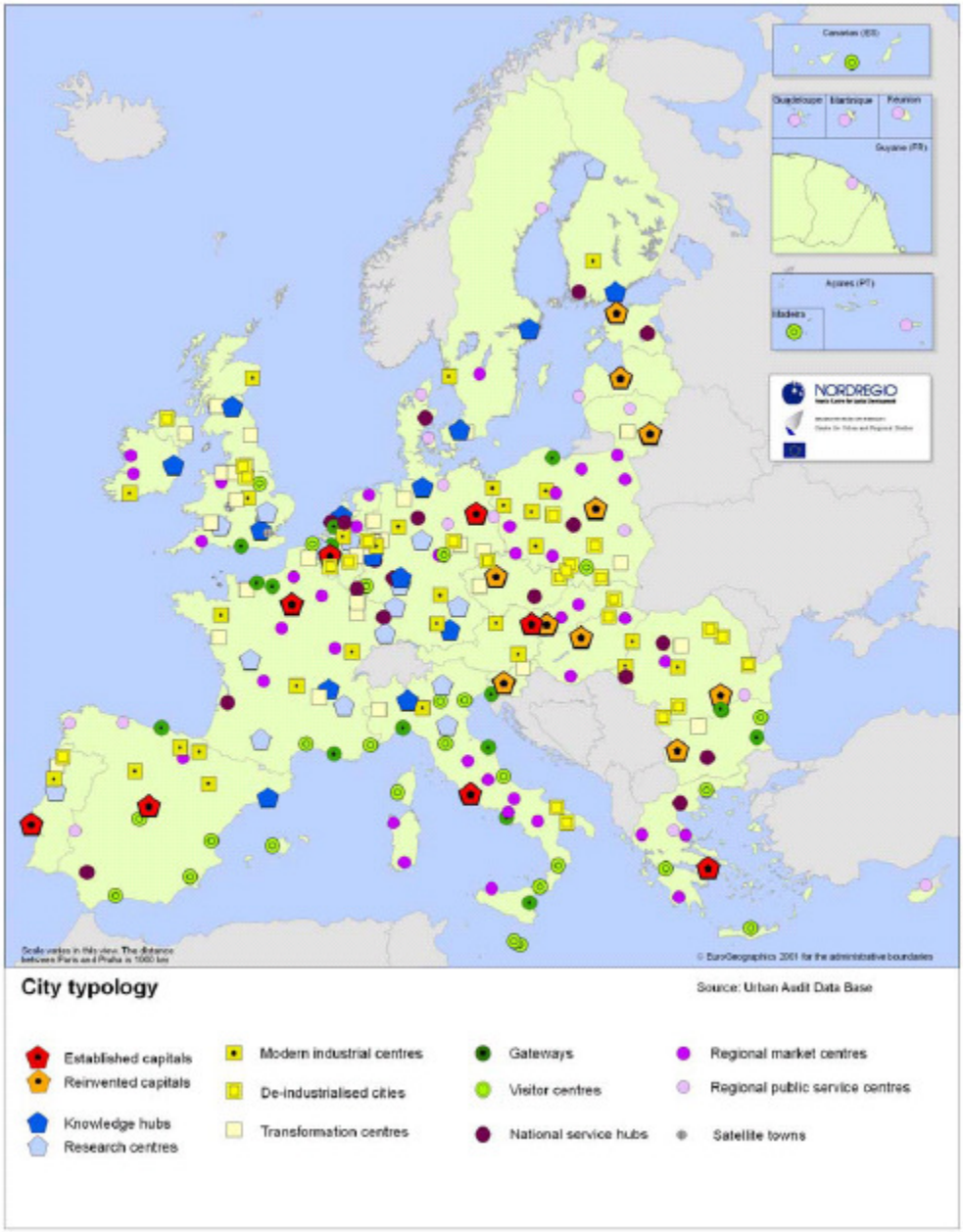
Position	City	Total	Industry	Knowledge intensive services	Distribution
1	Eindhoven	9,08	1	4	5
2	Delft	8,12	21	2	39
5	Utrecht	7,86	47	1	5
18	Rotterdam	7,18	24	22	7
20	Amsterdam	7,17	67	7	3
54	The Hague	6,23	81	14	35

Source: Bureau Louter, 2007

The State of European Cities report inventoried the availability of 250 indicators for urban development, for 258 cities in Europe. Based on this work, typologies were constructed, which were ultimately used for the comparison of European cities. Specific emphasis was put on population growth-stagnation, competitive position, quality of life and governance. This leads to the following map of Europe.

[2] Ronald Wall/Erasmus University, 2007, Rotterdam International City?
[3] Bureau Louter (2007), Economische monitor Delft 2007

Figure 1.2 City types mapped



There are three classes of city types:

1) *International hubs*: These are well-known international centres that operate at the European level or in some cases the global level.
2) *Specialised poles*: which play a (potentially) important international role in at least some aspects of the urban economy.
3) *Regional poles*: the pillars of Europe's regional economies.

According to this classification, Rotterdam fits in the category of " specialised poles" as it serves as a "gateway" (as does Marseille, Le Havre and Antwerp). Amsterdam belongs to the International hubs and in particular the Knowledge hubs (as does Hamburg).

A comparison on ports has also been undertaken[4]. From this study, London scores as the most connected city with the highest service values followed by Singapore, Hong Kong, Houston, New York, Paris, Dubai and Rotterdam. The strongest inter-urban linkages were found to be between London and Singapore and Hong Kong respectively. These findings and throughput data led to an international comparison. It appears that there are only a few world port cities, in which the port attracts large volumes of cargo and the city hosts comparatively many specialized advanced producer services: Singapore, Rotterdam, New York, Hong Kong, Shanghai, Hamburg, Antwerp, Dubai and Tokyo.

1.1.3 Demographics

In the following table an overview is presented of several demographic statistics of Rotterdam. There are several demographic factors worthwhile noting in comparison to other Dutch cities. The city's labour force contains a relatively larger group of lower educated persons than is the case in Delft. Moreover, the percentage of highly educated persons is low in comparison to the other major Dutch towns. The unemployment rate is higher than the Dutch average (4,5% in 2007). Average household income is below the national average (€ 30.100 in 2005). When studied in detail, there is a noteworthy discrepancy in household earnings between ethnicities. On average, non-native households have 3.500 euro per year less to spend than native households (2005). In particular, Moroccan households have the lowest income. Correspondingly, there are relatively more non-western households living below the poverty line. In total, 44.360 households have less to spend than this minimum amount, which is 17% of all households. This percentage has been on the rise since 2002, as is the case for the other major cities as well. The number of households living below the poverty line is higher in Amsterdam (absolute and relative), but lower in the other cities.

Table 1.2 Overview of demographics for Rotterdam

	1990	1995	2000	2005	2007	2008
Population	579.179	598.239	592.673	596.407	584.058	582.951
Potential labour force (15-64)			68%	68%	69%	69%
% male			51%	51%	50%	50%
% female			49%	49%	50%	50%
Education level (% of labour force)						
Low		37%	34%	27%	27%	29%
Average		38%	37%	39%	38%	37%
High		25%	28%	32%	33%	34%
Unemployment rate	11,7%	13,6%	6,8%	10,8%	7,4%	6,6%
Average household income			€ 21.000	€ 25.500		
Emigration			30.969	37.652	35.783	35.110
Immigration			32.506	29.444	33.628	37.448

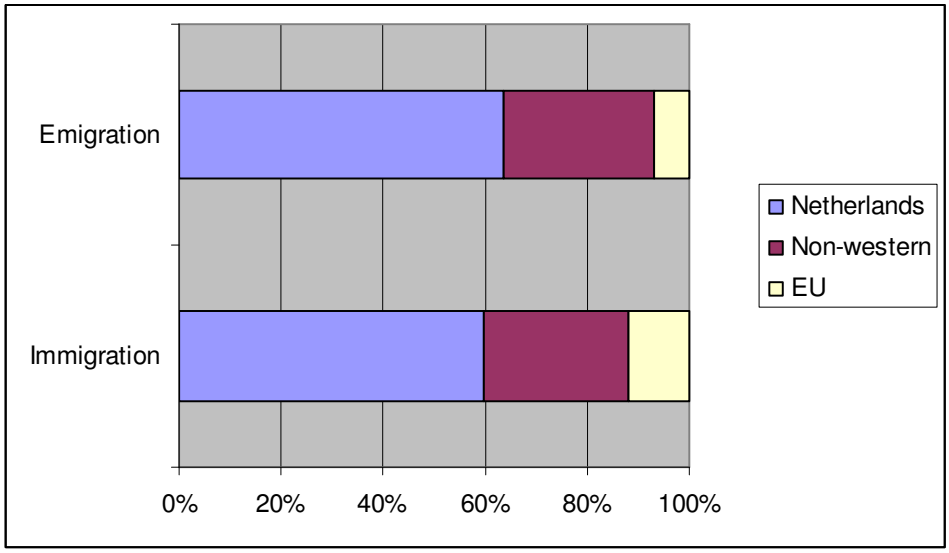
Source: CBS Statline and Centre for Research and Statistics, Rotterdam

Education levels: Low = primary education and first phase of (senior) secondary education, average = second phase of (senior) secondary education, high is HPE and university level.

Many non-western immigrants originate from Suriname and the Antilles, former Dutch colonies. A high number of African immigrants to Rotterdam originate from Morocco.

[4] W. Jacobs (Erasmus University), 2009, World Port City Networks

Figure 1.3 Migration: from/to Rotterdam in 2007



Source: Centre for Research and Statistics, Rotterdam

The education level of the migrant labour force in Rotterdam is lower than that of the native citizens, as the following table shows. The most prevalent education level among migrant workers from Western countries is 'High'.

Table 1.3 Education level of the labour force in Rotterdam

Labour force	Number of citizens	%
Native		
Higher education	63.000	42%
Average education	78.000	52%
Low education	8.000	5%
Migrant		
Higher education	23.000	23%
Average education	68.000	66%
Low education	10.000	9%

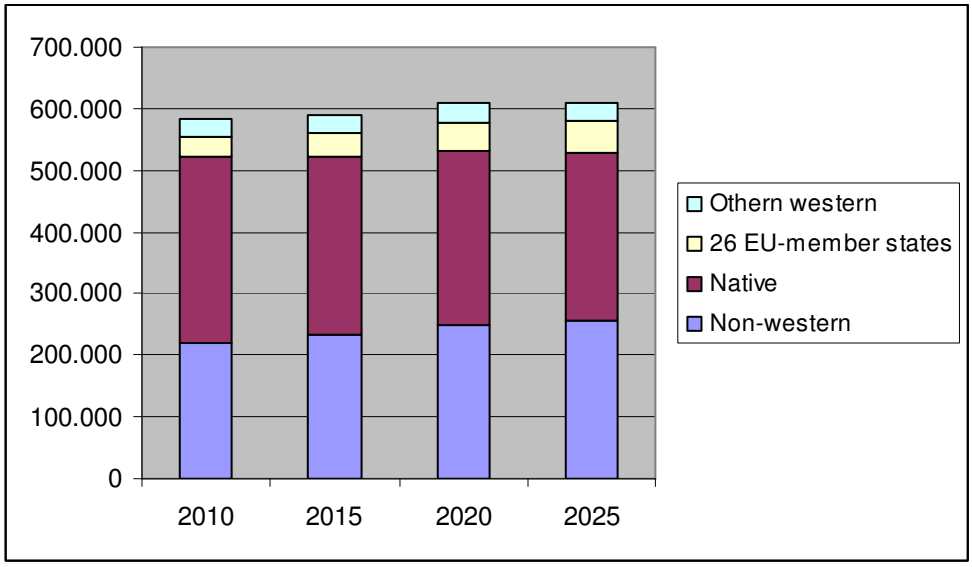
Source: CBS, 2007, Questionnaire labour force.

Education levels: Low = primary education and first phase of (senior) secondary education, average = second phase of (senior) secondary education, high is HPE and university level.

The Dutch population is forecasted to grow from 16,4 towards 16,9 million inhabitants in 2025. Accordingly, the population of Zuid-Holland is expected to grow from 3,5 to 3,6 million inhabitants in 2025. The 2025 forecast for Rotterdam amounts to 609.475.

With respect to the gender structure of the population, no major shifts are expected. The division male to female will remain more or less 50-50. The figure below shows the composition of the population in terms of origin.

Figure 1.4 Forecasted composition of the population (origin)



Source: Centre for Research and Statistics, Rotterdam

The state of health of the population in Rotterdam can be expressed in many ways. One international comparable indicator is the OECD indicator for the period 2004-2007. It amounts to 13,4% for the region Rotterdam-Rijnmond, which is lower than in Amsterdam and The Hague (17,5% and 13,7%), but higher than the Dutch average (12,6%). Amsterdam and Rotterdam-Rijnmond score highest on disabilities (11,2% and 10,1%). Also, striking is the relatively large group of citizens (8,5%) with respiratory system problems in Rotterdam. Rotterdam scores lowest of the major Dutch cities on the norm for physical activity with less than half of the citizens reaching the national norm. The percentage of obese citizens is relatively high.

1.1.4 Education statistics

Rotterdam is a true student city and reaches the 3rd position in The Netherlands based on the number of enrolled students on knowledge institutes.

Table 1.4 Number of students and share of non-western students

Institute	Number of students 2008[1]	Percentage non-western students in 2007[3+4]
Erasmus University (inc. Erasmus MC)	23.049	8,6%
TU Delft[2]	14.488	9,0%
Total academic institutes Delft/Rotterdam	34.269	
Rotterdam University	28.324	26,3%
Codarts (UAS fine arts)	1.000	14,4%
Eurocollege	220	
INHolland University	7.806	28,1%
Total universities of applied sciences Delft/Rotterdam	35.149	

[1] Rotterdam dec. 2008 'Spreiding van studenten wonend in Rotterdam, project Student City'.
[2] TU Delft data 2007 uit 'Kennis in kaart 2008'.
3 HBO Raad
4 VSNU

In 2008, 2367 students graduated from the Erasmus University. Around 2000 of these students are natives. Germany, China and Suriname are the top 3 countries suppliers of

incoming students. In Delft (2008), 1679 students obtained their master level (including 364 foreign students) while another 1420 received a bachelor diploma (including 80 foreigners). Rotterdam University handed out 4075 bachelor degrees in 2008. For INHolland University the number of graduates receiving their bachelor amounted to 1088 in 2008.

1.1.5 Economic structure

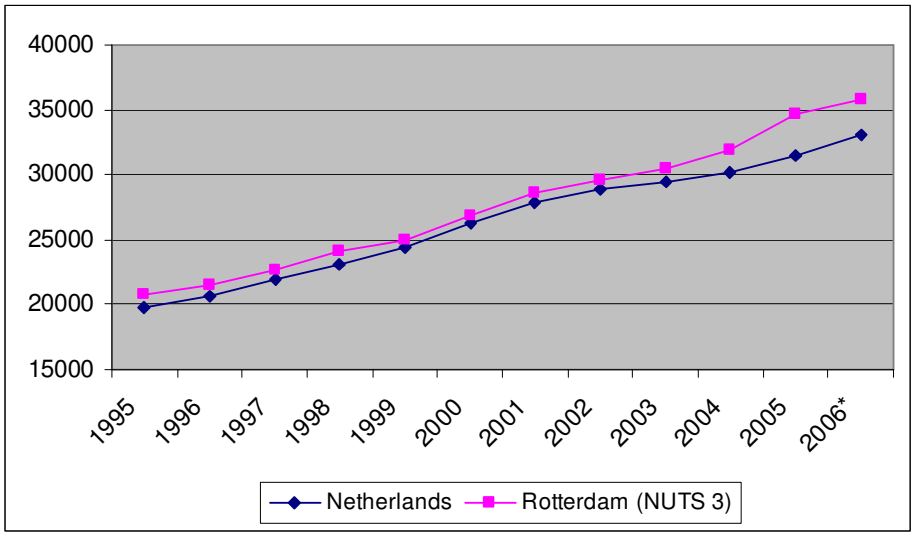
The most important economic driver of Rotterdam is the strategically situated port known as the 'Gateway to Europe'. In this port, goods from all over the world are imported, processed further and transported to the hinterland. The location in the Randstad strengthens the international reach of Rotterdam further.

Measured by employment, major sectors in the city's economy are business services and trade. Industry is relatively more present than in for example The Hague and Amsterdam, due to the port cluster in Rotterdam. Total employment fell somewhat during 2005 and 2006, but increased during 2007 and 2008.

The economy of Delft relies on more knowledge intensive companies and industries. The service sector showed the highest growth rates during recent years. The city aims to strengthen the focus on research-intensive companies with the development of a new Technopolis business area. This ambition is partly responsible for the delay in employment growth. The location in the Randstad, the proximity and access to a (highly educated) labour force and a diverse economic structure attract many companies.

The development of GDP per capita is displayed in the figure below, which also shows that Rotterdam scores higher than the Dutch average. The gap increased in recent years.

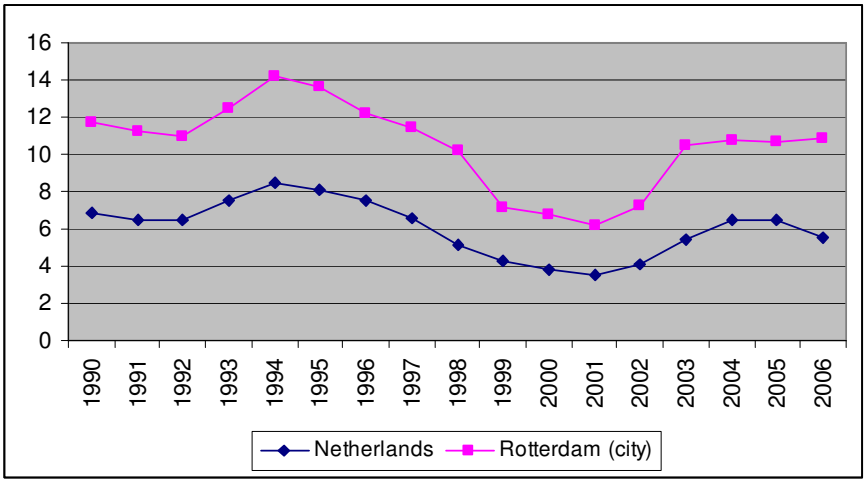
Figure 1.5 GDP per capita



Source: CBS

The unemployment rate of Rotterdam and The Netherlands follow a similar trend. However, the city's rate is above the national average, which also holds for Amsterdam. The gap is larger for Rotterdam.

Figure 1.6 Unemployment rate Rotterdam and The Netherlands



Source: CBS

The sectoral structure of Rotterdam is characterised by a relatively large share of transport and communication, which is related to the city's port activities.

Table 1.5 Sectoral structure according to number of jobs (in %)

	Netherlands	Rotterdam (NUTS 3)
Agriculture	3,2	1,8
Mining	0,1	0,0
Industry and energy	13,1	10,0
Construction	7,0	7,1
Trade	15,9	15,5
Bar/restaurant/hotels	3,0	2,5
Transport and communication	6,1	9,7
Financial services	3,8	4,1
Business services	17,4	20,3
Public sector	6,8	6,0
Education	5,0	5,0
Health sector	12,8	12,5
Environment, culture and remaining services	5,8	5,5
	100	100

Source: CBS

In the national economy average value added per FTE has increased by 92% since 1990. In the Netherlands, average added value per FTE is now 69.237 euro, but some sectors outperformed this growth. These were the mining (+318%), energy (+267%), construction (107%) and industry sector (109%). As table 1.4 shows, Rotterdam's energy and industry sector is rather influential in the city's economy and has benefitted from this relatively high growth.

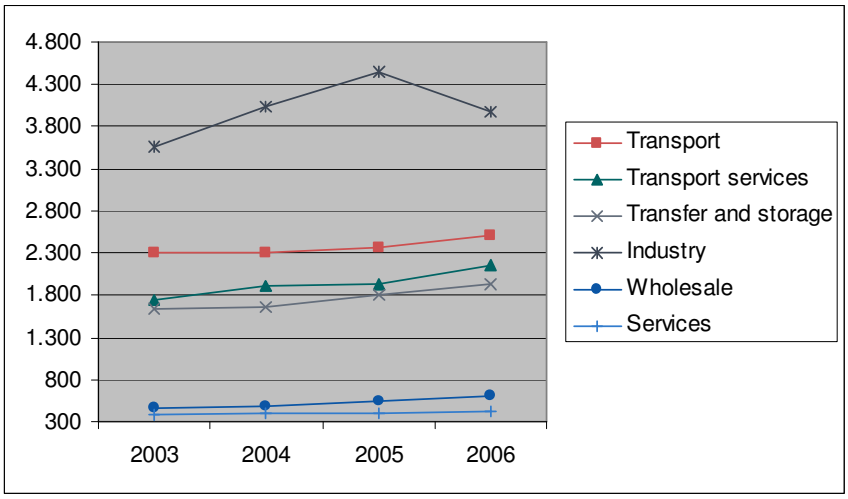
These activities are partly present in one of the three clusters that Rotterdam has selected, based on their potential contribution to the economic structure of the city. Three clusters are

given special attention in Rotterdam's economic policy to promote employment and economic development[5]:

- Port- industrial complex (around 65.000 jobs)
- Medical and Care (around 32.000 jobs)
- Creative sector (around 12.500 jobs)

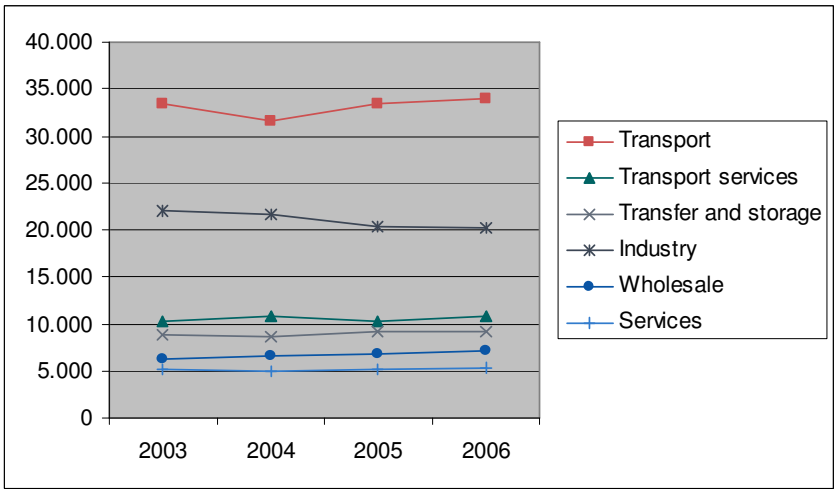
Rotterdam historically developed its port-industrial complex with traditional port related activities. Since then, international services and international companies (head offices) have been pulled towards the city, thereby expanding the cluster. Innovation became a necessary ingredient for further development. As a result, the port cluster currently contains many of the regional knowledge institutes that operate internationally. These activities are very important for the competitive position of Rotterdam. Economic impact of the port is diverse. The following figures show added value and the number of employees per sector.

Figure 1.7 Added value per sector (in million Euros)



Source: Port of Rotterdam

Figure 1.8 Number of employees per sector



Source: Port of Rotterdam

[5] Economische verkenning Rotterdam, 2008

With an annual throughput of more than 400 million tonnes of goods, Rotterdam is by far the biggest seaport in Europe. Within the industrial sector, chemical and oil industries employ the highest number of workers. Their added value per worker is also much higher than for other activities, which is shown in figure 1.7. Historically, the transport sector has offered the highest number of jobs in the port. Services and wholesale are smaller sectors. The economics of the port are characterised by:

(1) resource dependency;
(2) high added value for employees;
(3) relatively low patenting in the port industries because of the chemical industry;
(4) innovation based port industries that are related to off-shore and dredging.

The port of Rotterdam is investing continually to extend and improve its service. The most eye-catching project is the construction of Maasvlakte 2, a new port and industrial complex in the North Sea, with 1,000 hectares of industrial land directly on deep water and 750 hectares set aside for nature.

The Port of Rotterdam Authority plays an important role in the further development of the port. Its roles are defined as follows:

- ensuring safe port mooring/entering and patrolling (including to maintain order)
- developing and managing space for business activities
- investing and supporting infrastructure to improve accessibility of the port
- functioning as an operator and developer of commercial activities

Its mission statement is as follows: *'The Port of Rotterdam Authority is developing, in partnership, the European world-class port'*.

The medical cluster concentrates around the Erasmus University Medical Centre Rotterdam (Erasmus MC), which is also one of the major hospitals of Rotterdam. The combination of high-end research, care and education provides jobs to approximately 12.000 employees. Because of its substantial size, the Erasmus MC is important for the economic development of the city, especially when linkages are maintained with other regional health institutes, government and the business community.

Finally, the developing creative sector leads to all sorts of applications and innovations for the other clusters but also the establishment of an increasing number of creative sector businesses. In particular, attention is being paid to the design cluster, including architecture, technical and graphical design, audio/visual and new media. There are some designated terrains and buildings for these companies and start-ups are stimulated.

In a recent study[6], five other sectors have been classified as particularly important for the international profile and position of the city. These are:

- Trade (example: Unilever, Hagemeyer)
- Water (example: Van Oord, Boskalis, Arcadis)
- Oil/Gas (example: E.ON, BP, Exxon, Tamoil)
- Port related business services (example: ING, Loyens & Loeff)
- Technical and Knowledge intensive business services (example: Deloitte, Ernst&Young, KPMG, PWC, Royal Haskonig, IBM)

In 2008, 0,5% of all companies located in The Netherlands went bankrupt. This percentage also reflects the situation in Zuid-Holland, where 891 companies ceased to exist in 2008. The number of new establishments in Rotterdam set a new record last year and added to 11.527, or 6,7% of all establishments in Zuid-Holland. Among the new companies, construction and services were the most common sectors.

[6] Deloitte, 2009, Rotterdamse markt en sectoranalyse Rotterdamse regio

Employees in Rotterdam work in relatively larger companies compared to country statistics, as the following table shows.

Table 1.6 Number of employees related to company size (and in % of total employment)

	<10	10 - 100	> 100
Netherlands	2.036.080 (26%)	2.795.910 (35%)	3.114.260 (39%)
Rotterdam (Nuts 3)	114.760 (19%)	221.560 (38%)	252980 (43%)

Source: LISA

Investments of companies in the region (NUTS 2) in terms of employees working purely on research and development amount to 6.311 (FTE) in 2007. For the Netherlands as a whole this is 49.233. In the city of Rotterdam (2008) 714 citizens are employed by R&D companies. The region tries to cluster new knowledge intensive industries along the A13 highway (Delft – Rotterdam), the so-called Science Port Holland, and in the past into an Academic Centre Transport, meant to link the port of Rotterdam and innovation/knowledge creation in the transport and logistics sector.

R&D expenses for company employees more than double the R&D budget of universities. Research institutes contribute for only one tenth of the total expenses. For the Rotterdam region (Nuts 2), expenses of universities and companies seem more in line.

The contribution of the higher education institutes to the regional economy can be expressed amongst others in their employment effect[7]:

Table 1.7 Number of employees (FTE)

	Erasmus university (excl. Erasmus MC)	TU Delft	Rotterdam University	INHolland University
	1.603 (2008)*	4.517 (2008)**	1.825 (2007)***	800*** (2008)

Source: *University **VSNU ***Hogeschool ****HBO Raad

1.1.6 Social structure

To monitor development at neighbourhood level, the city recently developed the so-called 'social-index'. This index is composed of 4 indicators:

1. participation (education, social contacts, social-cultural involvement)
2. capacities (health, income, language)
3. quality of surrounding (physical)
4. social cohesion (neighbourhood level).

The scores are divided into the following categories:

Very weak	Problematic	Vulnerable	Sufficient	Strong
< 3,9	3,9 – 4,9	5 – 5,9	6 - 7	> 7

[7] A study on productivity of HEI's and their research activities is foreseen to be published shortly by among others TNO.

Data only exists for 2008 and 2009 as the index was developed recently. For comparison, scores for both years are displayed in table 1.8. This shows that progress has been made on all aspects, resulting in a higher score on the overall social index.

Table 1.8 Social Index

Year	Participation	Capacities	Social Cohesion	Surrounding	Index
2009	6,3	5,4	6,1	6,3	6
2008	5,9	5,2	6	6,2	5,8

Source: COS, Rotterdam

Social participation can also be indicated by for example use of the right to vote. The last election for the national parliament was characterized by an extremely high attendance of 80,4% of the population in the age of 18 and above. However, Rotterdam scored lowest of all Dutch municipalities with 70,9% of it's citizens participation.

A study in 2008[8] noted the following characteristics of the identity and culture of Rotterdam:

- Transformation from a port city to a city with a waterfront
- Citizens have a high work ethic
- Open and direct mentality as an approach to other people
- Preference for big festivals, large crowds, large following of the city's football teams
- Open space, city of opportunities
- Renewal
- City of youth and minorities

1.1.7 Administrative arrangements[9]

The Netherlands is a unitary state with three tiers of government: central, provincial and municipal with direct elections taking place for all three tiers. There are currently 12 provinces and 458 municipalities (OECD, 2007: 156).

The central government is responsible for macro-economic and social-distributional policies. It also collects the bulk of taxes (taxes on income, profits and capital gains, taxes on property, taxes on goods and services, etc.) and subsequently allocates large amounts of tax revenues to lower-level governments.

Provinces are responsible for the coordination of a number of public policies, such as planning, transport, culture and social affairs. They also have legal control over the municipalities (notably in the domain of planning where they approve the municipal land use plan) and over water boards, and they maintain some operating responsibilities for a few policy sectors like the management of the road system. In addition, the provinces correspond with the territorial level of decentralisation of some ministries such as those for administering public works, water management and agriculture (OECD, 2007: 159).

Municipalities are responsible for a wide range of policy sectors like roads, public transport, housing, local planning, environment, social affairs, economic development, education, health care, etc. The municipalities share many of their responsibilities with the central government, but they are relatively independent. The central government establishes the general framework, rules and norms that local authorities must follow, monitors most policies'

[8] K. Fortuin en P vd Graaf, 2006, De stad verhaalt van de stad

[9] Parts of this section have been written by SEO (Review Amsterdam)

implementation and controls the funding for most policy sectors (OECD, 2007: 159-60). Despite their broad responsibilities, Dutch municipalities have limited opportunities to impose local taxes. A relatively small proportion of municipal revenues are raised by local taxes. In fact, while in 2006, about 5% of total tax revenues were levied at the local level it decreased to 1% after part of the municipal property tax was abolished in 2006 (OECD, 2007).

The city is divided into boroughs, which have their own local level administrative bodies that complement the city's administration. This system is quite unique for Dutch cities and has been developed from the 1970's onward, to stimulate involvement of citizens in local policy. Currently, there are 13 of these local level bodies, with (official) responsibility for wellbeing, maintenance and execution of land use planning projects. These bodies also issue passports and a variety of permits and play a role in safety and employment policy matters.

With respect to regional economic policy, the central government's policy is aimed at enabling each region to provide the same level of public goods and services. This takes place via general and specific grants that are allocated to both provincial and (principally) to municipal governments. They are calculated according to criteria that try to take factors into account to compensate for regional cost differences and differences in revenue raising capacity. Central standards and limited local fiscal autonomy ensure that regional differences remain small. Policies promoting regional development are limited (OECD, 2007: 121-2). With the publication of the 2004 report "Peaks in the Delta" by the Ministry of Economic Affairs, regional economic policy in the Netherlands has shifted towards a focus on strengthening economic key regions. The expressed goal is to make use of the regional potential to create an internationally competitive investment climate. One of the designated areas is the south wing of the Randstad area, containing Rotterdam and Delft. The cities are classified as 'hotspots for innovation'.

The Ministry of Education, Culture, and Science (OCW) coordinates higher education policy. Over the last 20 years, the policy objective of the central government has been to decrease its steering and regulatory role and to increase institutional autonomy. The Ministry of OCW retains the power to cancel programmes and to prohibit the launch of new ones. But the overall policy is that educational institutes at all levels enjoy a great degree of autonomy. Following this, the Ministry of OCW has shifted many policymaking responsibilities to local governments and school boards. Municipalities are responsible for the provision of primary and secondary education. The higher educational institutes' budgets are largely financed with funds received directly from the Ministry of OCW. For this reason, local and regional governments have little influence over the provision of tertiary education.

Rotterdam and Delft cooperate within several partnerships. An example is the 'Kennisalliantie Zuidvleugel' (knowledge alliance south wing), in which they participate with more municipalities. The purpose of this network is to stimulate innovate businesses and knowledge transfer between government, education, entrepreneurs and research. Besides, both cities take part in an additional administrative body (WGRplus-regio). This is Stadsgewest Haaglanden for Delft (9 municipalities) and Stadsregio Rotterdam (16 municipalities).

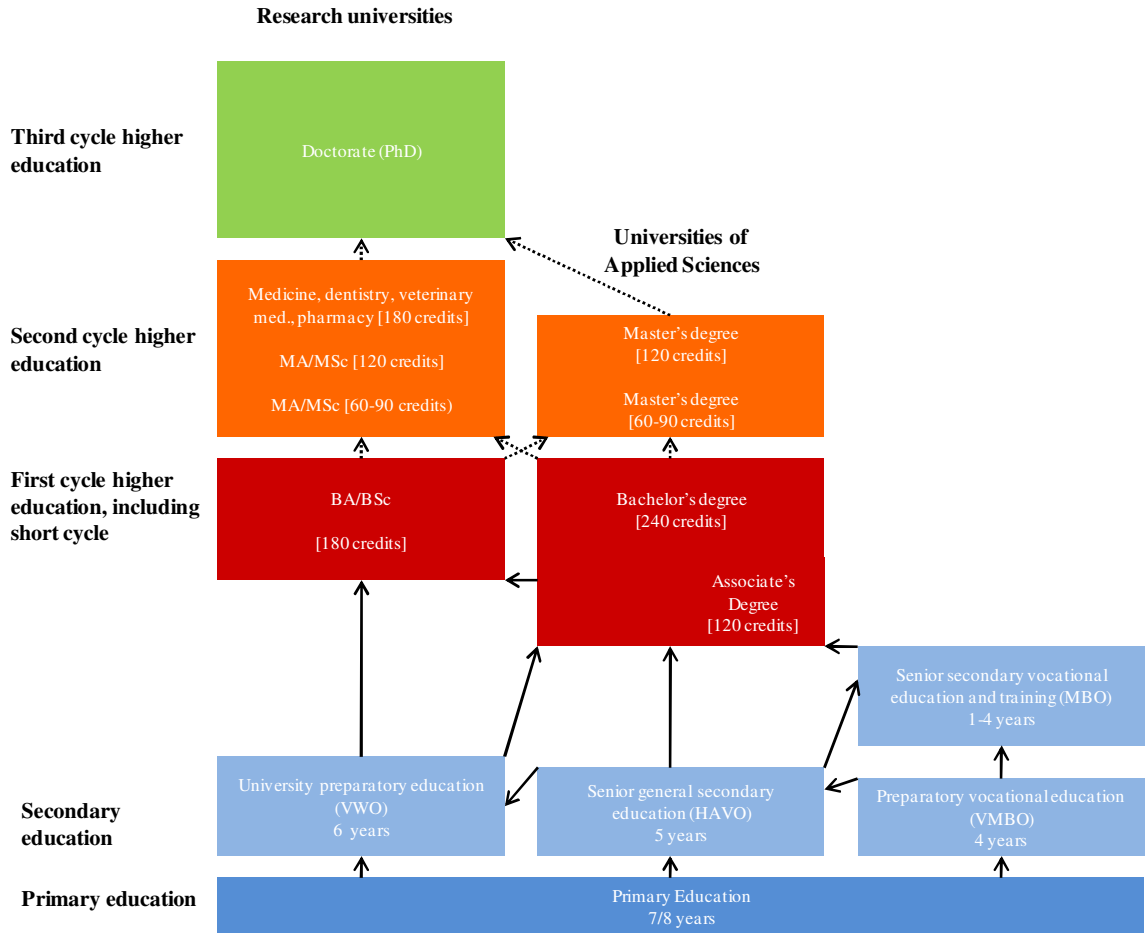
One last example of a partnership in the region is the A13 Knowledge boulevard development. Both cities and both universities cooperate to work on this highly concentrated area of technological businesses and research. Purpose of this development is twofold: first, it should offer a challenging business climate for highly educated and talented people. Secondly, it stimulates a constant flow of information exchange.

2 CHARACTERISTICS OF THE HIGHER EDUCATION SYSTEM

2.1 Overview of the national system of higher education

The Netherlands has a binary system of higher education, which means there are two types of programmes: research oriented education (*wetenschappelijk onderwijs*, WO or in English: University Education UE), traditionally offered by research universities, and higher professional education, (*hoger beroepsonderwijs*, HBO in Dutch and in English HPE), traditionally offered by hogescholen (Universities of Applied Sciences, or UAS). These programmes differ not only in focus, but also in access requirements, length and degree nomenclature as well (Jonge and Berger, 2006: 11). Figure 2.1 shows the structure of the higher education system in the Netherlands.

Figure 2.1 Structure of the higher education system in the Netherlands



* A solid arrow indicates a right to access, a dotted arrow indicates that some form of selection or bridging requirement may be applied

Source: Nuffic (2008)

The higher education system in the Netherlands is based on a three-cycle degree system, consisting of the Bachelor, Master and PhD degrees. The three-cycle system was officially introduced in the Netherlands at the beginning of the academic year of 2002-2003, in compliance with the Bologna process. The Bachelor-Master structure replaces the traditional Dutch educational system that awarded diplomas of *doctorandus* (*drs.*), *ingenieur* (*ir.*) or *meester* (*mr.*) after graduation from a four or five year during educational programme. Bachelor and Master programmes are available at both universities and UAS (although UAS focus on the Bachelor programmes) at publicly funded and privately funded institutions alike. Students passing the final examination of a UAS or research university, may use, in certain cases, certain titles. Graduates of Bachelor programmes at recognized UAS may use the title "Bachelor" (abbreviated to B and placed after the holder's name), followed by the subject or professional field (such as Bachelor of Education), but not the words "of Science" or "of Arts" (MinOCW, 2007a: 79). Graduates of Master programmes may use the title "Master", followed by the subject or professional field (such as Master of Education), but not the words "of Science" or "of Arts" (ibid: 79). Graduates of 3-year courses at recognized universities may use the title Bachelor of Arts or Bachelor of Science, depending on the subject studied (ibid: 80). Holders of university master's degrees may use the title "Master of Arts" or "Master of Science", depending on the subject studied (ibid: 80). Finally, PhD degrees can be awarded only by universities and the Institute of Social Studies in the Hague (Jonge and Berger, 2006: 12).

Higher Education and the EU: The Bologna Declaration

In 1999, the European Union ministers of education signed the Bologna Declaration. The Bologna Process was set up with a view to harmonise national education systems in the Member States and creating a single European Higher Education Area (EHEA) by 2010. The basic Bologna objective is that higher education in all the countries is to consist of two cycles of study: undergraduate (Bachelor) and postgraduate (Master). Other objectives of the declaration are the adoption of a system of easily readable and comparable degrees, establishment of a system of credits, promoting student and teacher mobility, promotion of European cooperation in quality assurance, and the promotion of several other European dimensions in higher education (with regards to curricular development, inter-institutional co-operation, mobility schemes and integrated programmes of study, training and research). In the Netherlands, the Bologna Process has led to the introduction of the Bachelor-Master system, the accreditation system (see § 2.1.4) and the European Credit Transfer System (ECTS).

Source: MinOCW (2007a: 68), EU (1999)

UAS master's degrees are a relatively new phenomenon. Until recently, UAS did not receive government funding for their master programmes. As a result, these programmes were more expensive than the master's programmes offered by research universities with tuition fees varying from EUR 5,000 to EUR 15,000, (MinOCW, 2007a: 73). In 2007, however, the Ministry of Education, Culture and Science formulated a new strategic agenda for higher education, research and science policy, *Het Hoogste Goed*, making EUR 5 million (increasing up to EUR 20 from 2011) of public funds available to finance master's degrees offered by UAS (MinOCW, 2007b: 12). At the end of 2007 there were approximately 130 accredited master's programmes at UAS institutions (MinOCW, 2007a: 75-76).

Access to the system of tertiary education is obtained by qualifying from one of the following types of schools:

- MBO (in English: SVE) level 4 (senior secondary vocational education, gives access to UAS);
- HAVO (five-year higher level of secondary education, providing direct entry to UAS);
- VWO (six-year highest level secondary education, providing direct access to UAS and universities);

- Successfully completing a first-year examination at a UAS allows access to a university program in the same area of expertise (ibid: 11).

2.1.1 Universities

Research universities combine academic research and teaching. University education focuses on training in academic disciplines, the independent pursuit of scholarship and the application of scholarly knowledge in the context of a profession and aims to improve understanding of the phenomena studied in the various disciplines and generate new knowledge (MinOCW, 2007a: 68). The university sector consists of 14 government-funded research universities (including the Open University), eight academic medical centres and several publicly funded research institutes affiliated with the universities. Two of the universities, the Erasmus University and Delft University of Technology, are based in the Rotterdam area. Furthermore, one of the nation's top academic medical centres is based in Rotterdam: the Erasmus MC (Medical Centre, affiliated with the Erasmus University). Besides the 14 government-funded universities, there are a number of recognized universities which are not funded by the Ministry of Education, Culture and Science, however, the terms of the Higher Education and Research Act do apply to these universities and the Bachelor's and Master's degrees awarded by these institutions are recognized by law. These recognized universities consist of six universities that offer theological courses, one offering a degree course in humanism, and the Nyenrode Business University (ibid: 72). Every university has it's own research institutes and also participates in several (inter)national institutes. See the list in annex 5 for the research institutes from Delft and Erasmus University.

2.1.2 Universities of Applied Sciences

UAS provide theoretical and practical training for occupations for which a higher professional qualification is either required or useful. Graduates find employment in various fields, including middle and high-ranking jobs in trade and industry, social services, health care and the public sector (ibid: 76). Currently 41 UAS receive government funding (HBO-raad, 2009a). They consist of general institutions as well as institutions specializing in a specific field, such as agriculture, fine and performing arts, or teacher training. Compared to universities, UAS offer more practically oriented programmes. Also with respect to research activities, the UAS have another function than research universities. Whereas the universities contribute to the development of scientific knowledge and as well as contributes to the utilization of this knowledge in society, research activities at UAS have a mandate to contribute to the maintenance and development of the professional practice in society (Weert and Boezerooy, 2007: 31). Rotterdam University and INHolland University are the Universities of Applied Sciences (UAS) within the region.

Applied research at UAS can be considered one of the bottlenecks of the Dutch higher education system, as the proportion of innovative enterprises that co-operate with higher education institutions and with research institutes is relatively low in the Netherlands as compared with other EU15 countries (OECD, 2008a: 70). Moreover, UAS are not eligible for basic government research funding (Weert and Boezerooy, 2007: 31). Instead several regulations have been established, such as the so-called RAAK-regulation, offering financial support to initiate research projects in the field of development and knowledge (see § 2.4).

In order to stimulate UAS to conduct more practice-based research and improve innovative strength of these institutes, *senior lectureships*[10] were introduced. The job specification of a senior lecturer is to transfer knowledge to industry (SME) and society in general and to

[10] In the whole Review report, we make use of the NUFFIC glossary and translation of terms http://nufficglossary.nuffic.nl/

develop applications of knowledge on demand. They are knowledge experts in their field and are specialists in the application of knowledge in professional context within companies and organizations (Jonge and Berger, 2006: 12-13). There are currently almost 400 senior lecturers working at UAS throughout the country (HBO-raad, 2008b) of which 37 are active in Rotterdam. Within HS Rotterdam there are seventeen *senior lectureships* and 31 senior lecturers. INHolland University has six *senior lectureships* and six senior lecturers (one vacancy) in Rotterdam.

Initially the *senior lectureships* were partly financed from subsidies made available by the Foundation Knowledge Development (SKO), implying that they were indirectly paid for by the government (SKO, 2008: 18). The remainder was paid for by the UAS themselves. Recently the system has changed and *senior lectureships* are now fully paid for from the first stream lump sum funds that UAS receive from the Ministry of Education, Culture and Science. Because the *senior lectureships* are now financed with regular funds, SKO is no longer involved in the evaluation of UAS applications for new senior lecturers. This implies that UASs have come to enjoy a high degree of autonomy in using government funds for the creation of *senior lectureships*. They are free to choose the knowledge fields in which senior lecturers should be active and enjoy considerable autonomy in determining the job description of a senior lecturer.

Broadly speaking a senior lecturer has four tasks: knowledge development, professionalization of lecturers at their UAS, renewing education curricula and knowledge circulation from and to society (SKO, 2008: 15). Each senior lecturer is expected to form a *kenniskring* ('knowledge circle') consisting of UAS lecturers and professionals from the private sector. This is to ensure that their research and expertise reaches students and has enough practical relevance. Senior lecturers are expected to give lectures and supervise PhD students. There are no standardized measures of quality to review the performance of senior lecturers. SKO has evaluated senior lecturers based upon professional standards developed by senior lecturers themselves in collegial meetings. In its final evaluation report on *senior lectureships* SKO has recommended the development of professional standards in relation to the quality of research (ibid: 21). The career opportunities of senior lecturers are limited in practice because 'seniority' is an important condition for the fulfilment of *senior lectureships*. About 60% of all senior lecturers are 50 years or older. In addition, the average term for a *senior lectureship* is 4-5 years although re-appointment is possible. The majority of senior lecturers hold another position outside the UAS at which they are appointed. 40% of the senior lecturers with a second job work at a university, whereas another 45% work at a profit or non-profit institution (ibid: 12).

Mission statements of the region's HEIs

Erasmus University
To cultivate talent and produce knowledge at the academic level to benefit mankind, business and society, internationally, nationally and regionally.[11]

Delft University of Technology
Delft University contributes with her unique technological infrastructure, broad knowledge base, worldwide reputation and successful alumni to sound solutions for urgent social national and international issues.[12]

[11] Source: EUR(2008). *At home in the World. Erasmus 2013. Strategy document.*
[12] Source: TU Delft (2007). *Challenge the future. Instellingsplan TU Delft 2007-2010.*

Rotterdam University
Knowledge institute from and for the region.[13]

INHolland University
INHolland wishes to bring young talent as far as possible, by putting entrepreneurship, social involvement, internationalization, and diversity high on the agenda. INHolland operates with the philosophy of 'close to the student'.

2.1.3 Accreditation

For fifteen years until 2002, the quality assurance process for higher education in the Netherlands was a system of peer review (OECD, 2008a: 83). Many, however, felt this system of accreditation was not sufficiently independent or objective. Moreover, possible interventions by the government were limited to publicly funded institutions. As the Netherlands introduced the Bachelor and Masters degrees, there was a change in the quality assurance process, with a movement towards external accreditation of programmes to reflect the wider international context (ibid: 83). In part, this new system of national accreditation was implemented in response to the 1999 Bologna declaration, which identified certain expectations of higher education in Europe, including quality assurances processes.

The Netherlands-Flanders Accreditation Organisation (NVAO) was established by law as the accrediting body, with responsibility for the accreditation of all Bachelors and Masters programmes from publicly funded institutions, and private institutions wishing to offer degree programmes (ibid: 83). This implies that private higher education institutions will be included in the accreditation procedures on an equal footing with public ones, apart from the issue of public funding (Weert and Boezeroy, 2007: 71). This will open up the Dutch higher education system for globalization forces. The NVAO evaluates each Bachelors and Masters programme for accreditations on a 6-year cycle (MinOCW, 2007a: 76). The criteria used to evaluate these programmes are aims and objectives, content of the programme, deployment of staff, facilities and provisions (OECD, 2008a: 84).

The Ministry of Education, Culture and Science has set the ambition to simplify accreditation of higher education programmes at UAS and universities. In order to achieve this, the Ministry wants to broaden and virtually halve the number of Bachelor programmes at universities. This is a matter of 'labelling' and is not anticipated to affect the student population. University Master degree programmes and UAS courses will also be restructured and reduced in number. New programmes of study will not be accredited until the Ministry of Education, Culture and Science has first established that there is a social demand for them (MinOCW, 2007a: 121). In the short term, the Ministry of Education, Culture and Science aims to reduce the administrative burden by obliging the NVAO to focus more on the education content of study programmes and less on the process involved.

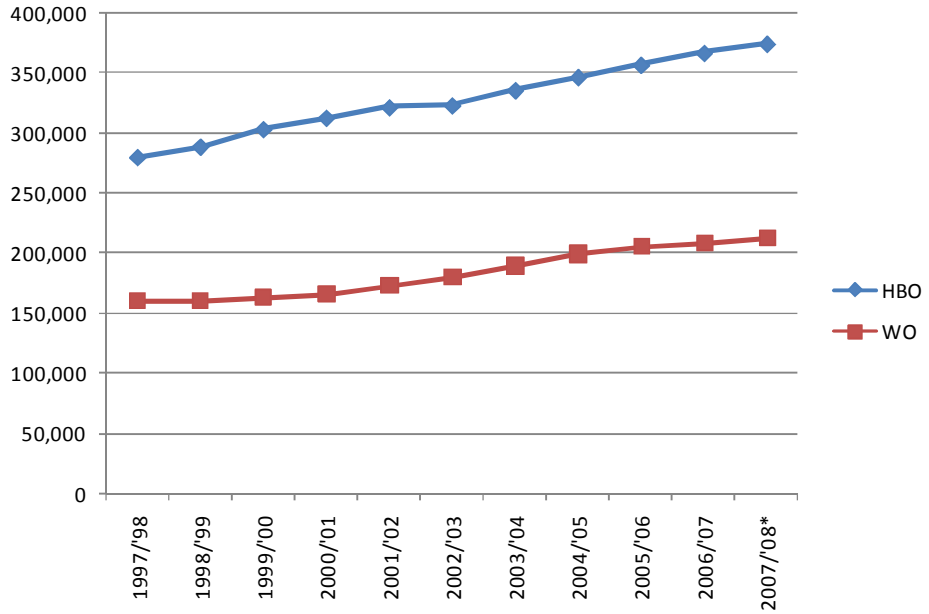
2.1.4 Overall size of the higher education system

The total number of students in higher education rose from just over 438,000 in 1997-98 to around 585,000 in 2007-08 (see Figure 2.2). This is an increase of more than 33% over a 10-year period. This growth, however, was mostly contributed by the UAS. For a large part, this can be explained by an increasing gap in graduates from secondary educational schools between the HAVO level (which mainly prepares for studies at a UAS) and VWO (which predominantly prepares for studies at a research university) (Statistics Netherlands Statline, 2009a). The inflow of new students to UAS shows a strong growth over the period 1997-98 to

[13] Source: Hogeschool Rotterdam (2009). *Position paper 2007-2011.*

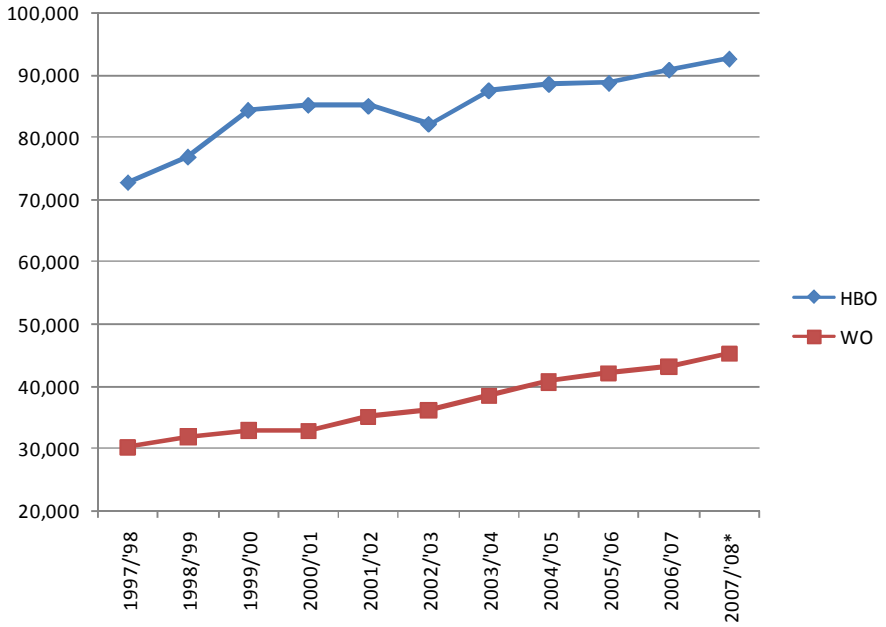
1999-00, followed by a three-year period of decline and subsequently growth from 2002-03 onwards. The inflow of students to research universities shows a steady growth over the entire period from 1997-98 to 2007-08. In relative terms, the inflow of students to UAS increased by 27% over the past ten years, whereas the inflow of students to research universities increased by almost 50%. This means that research universities are likely to catch up with UAS in terms of the total student enrolment over the next couple of years. As Table 2.1 shows, the growth of the student population at UAS has been positive for more than a decade. By comparison, the number of students enrolled at universities was in decline over the period 1993-98 (see Table 2.2). In recent years the number of university students is on the rise again, albeit the gap between enrolments at UAS and universities is also widening. In the academic year 2007-08, the UAS sector had some 384,000 students whereas some 219,000 students were enrolled at the 14 Dutch research institutions.

Figure 2.2 Student enrolment at UAS (HPE) and universities (UE)



Source: Statistics Netherlands Statline (2009b)

Figure 2.3 Inflow of first year students at UAS (HPE) and universities (UE)



Source: Statistics Netherlands Statline (2009c)

Table 2.1 Student enrolment at UAS in the Rotterdam Metropolitan Area

	Rotterdam University	INHolland* University (Rotterdam area)	**Total Netherlands**
1998	19,025	--	**288,779**
1999	20,073	--	**303,388**
2000	20,233	7,748	**312,905**
2001	20,061	9,167	**321,741**
2002	19,554	9,613	**323,144**
2003	20,602	10,222	**335,860**
2004	21,883	10,448	**346,835**
2005	23,927	9,541	**357,023**
2006	25,994	8,848	**366,856**
2007	27,241	8,731	**374,935**
2008	28,324		**383,833**

Source: HBO-raad (2009b) and INHolland administration

* Note: In the period 2003-2006 INHolland suffered a decrease in inflow and studentnumbers of about 3% each year. Since 2006 this decrease stopped and after that there is an annual growth of 2%. The decrease was partly the consequence of separating the division of senior secondary vocational training (SVE). The decrease was also the effect of the merger and the introduction of a new concept of education with a new arrangement of studies (major/minor).

Table 2.2 Student enrolment at universities in the Rotterdam Metropolitan Area*

	Erasmus University			TU Delft			**Total Netherlands**		
	Bachelor	*Master*	*Total*	*Bachelor*	*Master*	*Total*	*Bachelor*	*Master*	*Total*
2002	16.079		16.079	10.335	2.862	13.197	174.012	4.541	178.553
2003	16.894	486	17.380	10.156	3.216	13.372	178.738	93.46	188.084
2004	16.586	1.897	18.483	10.142	3.235	13.377	181.600	16.488	198.088
2005	16.729	2.684	19.413	10.300	3.251	13.551	175.732	28.704	204.436
2006	15.870	3.500	19.370	9.737	3.969	13.706	164.919	42.240	207.159

2007	13.703	5.825	19.528	9.706	4.720	14.426	158.091	53.383	211.474
2008	13.569	5.908	19.477	10.267	5.185	15.452	158.691	60.327	219.018

* Due to the 'zachte knip', which means that students can sign in for bachelor and master at the same time, we present here the numbers for the major subscription. As a result of this, it's possible the numbers shown are a bit low.

Source: VSNU (2009a)

Table 2.3 shows the split between educational programmes offered by UAS and research universities according to the source of funding in 2004. As the table indicates, 35% of all educational programmes (657 out of 1842) are offered by privately funded UAS. Most of these educational programmes are in the domain of economics (Jongbloed et al., 2004: 10-11). In total there were 62 privately-funded UAS in 2004. Among research universities the share of educational programmes provided by privately-funded institutions was relatively minor: only 33 out of an estimated total of around 1,000 programmes were offered by privately-funded institutes. Most of these educational programmes were in the theology domain. It is estimated that the number of students at privately-funded UAS and research universities is around 60,000 to 70,000 (ibid: 14).

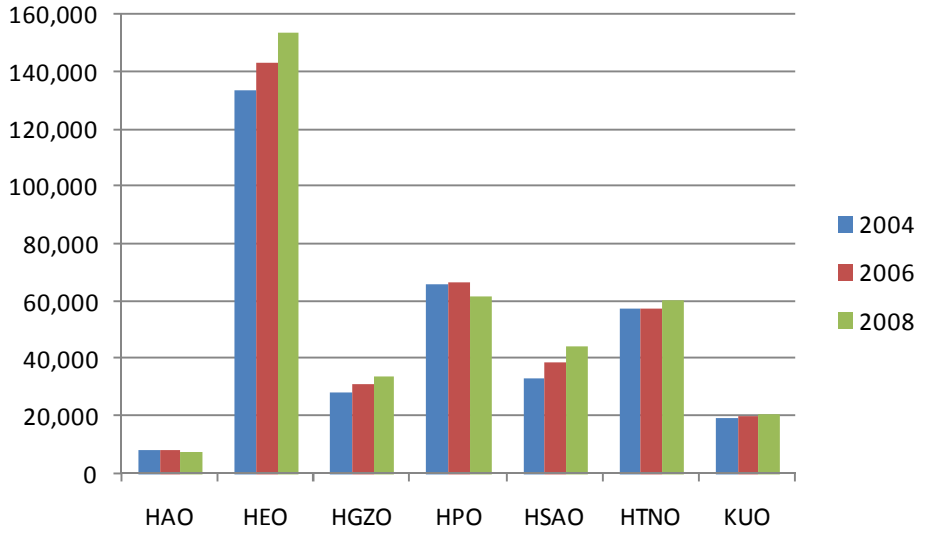
Table 2.3 Public and private funding in higher education

	Number of educational programmes	
	Public funding	Private funding
UPA	1185	657
University	967	33

Source: Jongbloed et al. (2004)

Figure 2.4 is based on a broad classification of educational programmes at UAS into seven different types: *hoger agrarisch onderwijs* (higher agricultural education, HAO), hoger *economisch onderwijs* (higher economic education, HEO), *hoger gezondheidszorg onderwijs* (higher health care education, HZO), *hoger pedagogisch onderwijs* (higher teacher education), HPO), *hoger sociaal-agogisch onderwijs* (higher behavioural-societal education, HSAO), *hoger technisch onderwijs* (higher technical education, HTNO) and *kunstonderwijs* (art-related education, KUO). As the figure shows, the vast majority of UAS students are enrolled in economics and business-related programmes (HEO). With an increase of over 20,000 students over the last four years, economics and business-related education was the fastest growing sector in absolute terms. In relative terms, the growth in HEO students (15.4%) was surpassed by the growth in health-related programmes (HGZO, 21.4%) and social-behavioural programmes (HSAO, 33.5%). Agricultural (HAO) and teacher education-related (HPO) programmes have become less popular and faced a decline of over 600 and almost 5,000 students, respectively. Especially the development in the teacher education sector is significant, as the labour market for primary and secondary education is plagued by a lack of supply of teachers.

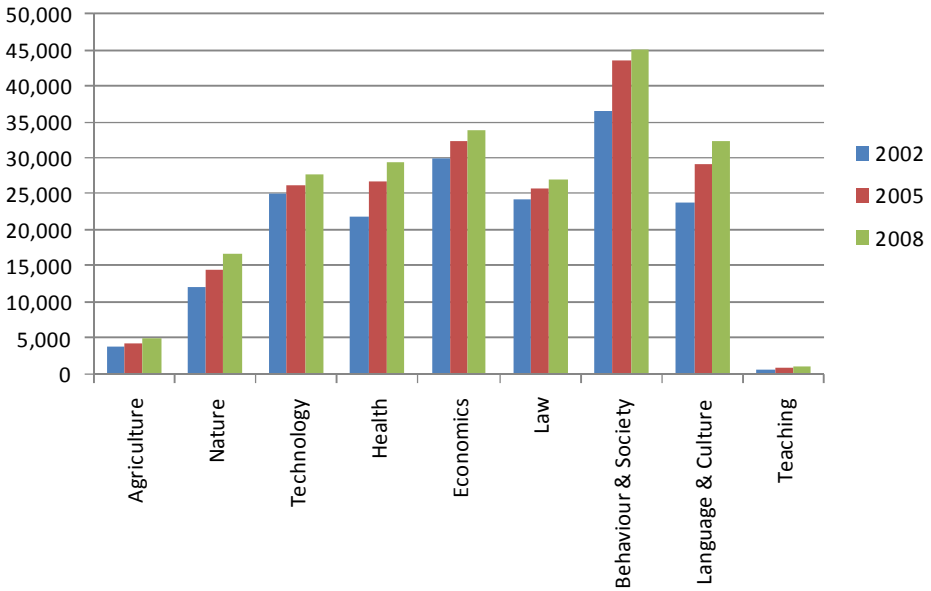
Figure 2.4 Students at UAS by broad disciplines



Source: HBO-raad (2009)

Figure 2.5 gives a broad classification of educational programmes at research universities according to nine different domains: agriculture, nature, technology, health, economics, law, behaviour & society, language & culture, and teaching. Most students (more than 45,000) are enrolled in Bachelors or Masters programmes within the behaviour & society domain, such as psychology. Over the years 2002-08, the largest absolute increase in students (8,710) is found in the educational programmes related to the theme language & culture. In relative terms, the growth of these educational programmes (35%) was only surpassed by the increase in students enrolled in programmes in the domain nature (an increase of 39%). Contrary to UAS, the student enrolment at universities is on the rise for all educational domains in recent years (over the 1993-98 period the total student population at universities was still in decline). Noteworthy, the growth in university students has also been low for the domains economics (13%) and law (11%), which are among the fastest growing areas of interest for UAS students.

Figure 2.5 Students at universities by broad disciplines



Source: VSNU (2009b)

2.1.5 Dutch HEIs in an international perspective

The Dutch association of research universities, the VSNU, uses three different international rankings to measure the competitiveness and quality of the research universities within the Netherlands: 'Leiden Ranking', the 'Academic Ranking of World Universities' (ARWU) of the University of Shanghai, and the ranking published by the 'Times Higher Education Supplement' (THES). The 'Leiden Ranking' is a research ranking published by the Centre for Science and Technology Studies (CWTS) of Leiden University. It is entirely based on bibliometric indicators. The ARWU ranking is also based on research results, but uses a different set of indicators. The ARWU puts a much greater emphasis on the number of Nobel Prize winners and Field Medal winners, the number of highly cited researchers (HiCi) and the number of articles published in Nature and Science than the Leiden Ranking. The THES ranking is based on reputation and educational and research indicators, which are each given a 50% weight. Table 2.4 shows the positions of the ten Dutch universities that are included in the Leiden Ranking of European universities.

Table 2.4 Leiden Top 100 European Universities 2003-2007

Position	University
8	Erasmus University Rotterdam
11	Technical University Delft
15	VU University Amsterdam
18	University of Amsterdam
19	Utrecht University
27	Leiden University
29	Wageningen University
30	Groningen University
31	University of Maastricht
40	Radboud University Nijmegen

Source: VSNU (2009c)

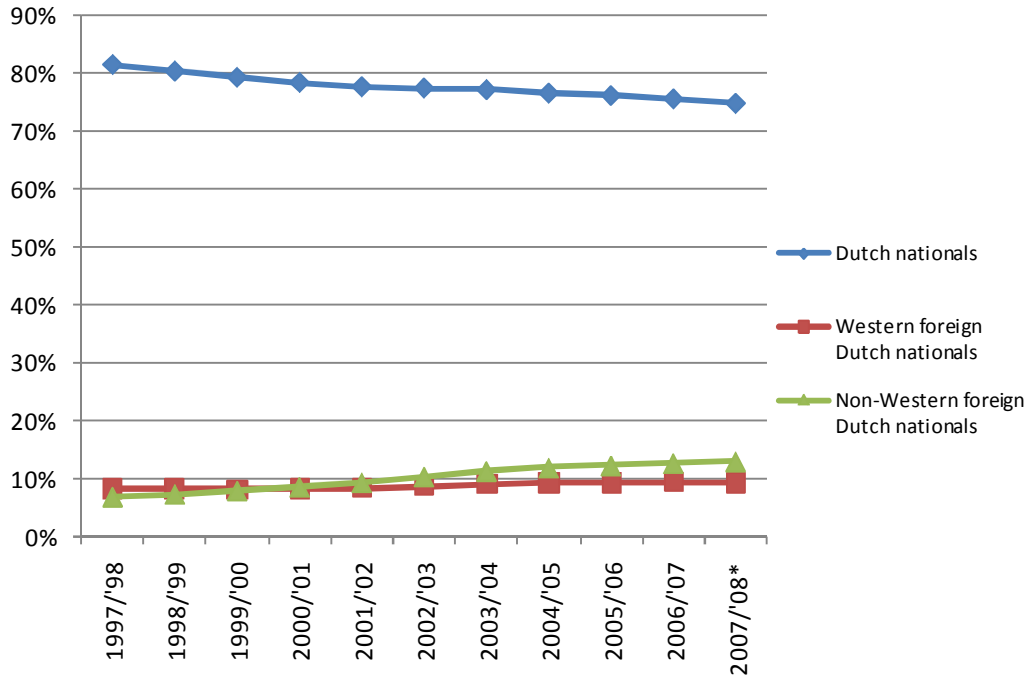
According to the Leiden Ranking, ten Dutch research universities are amongst the forty best universities of Europe. According to the ARWU ranking, twelve Dutch universities are part of the top 210 universities in the world. When looking at the THES ranking, eleven universities in the Netherlands are counted amongst the top 200 universities in the world (VSNU, 2009c).

2.1.6 Issues and debates

In its 2008 evaluation of the Dutch tertiary education system, the OECD expressed its concern about the relatively low participation of non-Western minorities in higher education in the Netherlands as in other European countries (OECD, 2008a: 52). On the positive side, it noted that total participation is increasing, both in research-intensive universities and UAS. Indeed, among 17-25 year old non-westerners, the participation in tertiary education increased from just 10% in 1995 to 16% in 2002 (De Jonge and Berger, 2006: 50). At the same time, participation of the overall population in tertiary education increased as well. As a result, the gap in relation to Dutch youngsters and western minorities is still considerable (ibid: 50). Figure 2.6 shows the higher education student population broken down by ethnic group. It signifies that the relative position of non-Western foreign Dutch nationals at UAS and universities has improved over the past ten years. Their share in the total student population has increased from 7 to 13% over the period 1997/98 to 2007/08. This outstrips the increase of the relative share of foreign Dutch nationals aged 15-25 years in the total population, which increased from 12% to 16% over the same period. At Rotterdam based HEIs the share

of foreign Dutch nationals is much higher, although the minorities also constitute an important part of the city's population.

Figure 2.6 Participation in tertiary education, relative shares, by ethnic groups



Source: Statistics Netherlands Statline (2009e)

The OECD also concluded that in the Netherlands there is a relatively weak commitment to lifelong learning and professional upgrading in the award programmes that have significant labour market cachet (OECD, 2008a: 12). In 2008 the OECD reported: "In the Netherlands 86.1% of 15-19 year olds are enrolled in education, which is above the OECD average of 80.5% but on par with Western Europe. Participation of the 20-29 year age group in the Netherlands (25.5%) is just above the OECD average (24.7%). After 30 years age participation rates fall well below the OECD average, however. Just 2.9% of 30-39 year olds are enrolled in education as defined by OECD compared to 5.6% in the OECD as a whole, 15.6% in the UK and 13.5% in Sweden. (OECD, 2008a: 12)." In 2009 the situation has hardly improved. Participation in education of the 20-29 year age group in the Netherlands (26.9%) has increased more than the OECD average (25.1%) (OECD, 2008b). Nevertheless, among 30-39 year olds the gap has worsened: just 2.7% is enrolled in education compared to 5.7% in the entire OECD and 13.8% in Australia and Finland (OECD, 2008b). The problem with lifelong learning in the Netherlands may be embedded in social culture, in that older people do not see award programmes in tertiary education as an option (OECD, 2008a: 12). In addition, the education system discourages participation of older people: if they have not enrolled prior to 30 years of age higher education students lose their eligibility for student loans and some tuition charges rise steeply (ibid: 12).

2.2 Higher education and the labour market

In the Netherlands, the Research Centre for Education and the Labour Market (ROA) of Maastricht University performs research on the match between education and the labour market, for instance, by making forecasts of the developments in supply and demand in the labour market, differentiated by occupation and education. The most recent ROA report, entitled "The labour market differentiated by occupation and education until 2012" (ROA,

2007) predicts good labour market prospects for graduates from universities and UAS. The report estimates that 45% of the graduates at UAS level have good or very good labour market prospects (see Table 2.5). Among university graduates, 61% has followed a study that provides good or very good labour market prospects. The worst shortages are expected to occur in the construction, banking and insurance, catering and professional services, health, and government and education sectors (ROA, 2007: 12). The effects of the recent 'credit crisis', however, have not been incorporated in the ROA report and it is therefore expected that demand for labour in the construction, banking and insurance, and catering and professional services sectors will turn out much lower than predicted. The demand for labour in the health, government and education sectors are of a more structural nature. A surprising observation is that the labour market prospects for secondary education (VMBO, HAVO and VWO) are relatively good. One reason is that the demand for workers with only secondary education responds more volatile to economic growth (and the model assumes relatively strong economic growth). Another reason is that the labour market prospects for students enrolled in social-cultural and economic programmes are relatively bad.

Another indicator of labour market prospects for students with various educational degrees are unemployment rates per educational level. Unemployment rates are highest for those with only primary education (9.2%). Those with a secondary educational degree are somewhat better off as their unemployment rate is around 6.5%. People with a tertiary educational degree have significantly better chances of finding a job. For those with a bachelor degree (from either a UAS or research university), the unemployment rate is 2.6%. For those with a master of PhD degree this is 3.3%. The general picture is that the unemployment rate declines with the educational level. One interesting observation, however, is that people with a more practice-oriented tertiary education (SVE and HPE/UE bachelor) have better labour market prospects than those with a masters or PhD degree from a research university. Among all educational levels, those with a more technical-oriented study tend to have better labour market prospects than those who follow a more social/economic-oriented study. In Rotterdam a third of the labour force works in a technical-oriented profession in technique, transport and logistics. This is a bit more than the 30 % average in the Netherlands (Van der Aa, Kans en Van Nuland, 2009). It is expected that until 2012, despite the current crisis, 3,000 jobs will be available each year in these sectors. Around 550 of these are at a higher educational level (Cuelenaere en Siegert, 2009).

Table 2.5 Labour market prospects per educational level

	Graduates with good or very good labour market prospects for 2007-11 (%)		Unemployment (%)
Primary education	0	Primary education	9.2
VMBO	50	VMBO	6.5
HAVO/VWO	100	HAVO/VWO	6.4
SVE	27	SVE(2&3), SVE(4)	4.6, 3.1
HPE	45	HPE/WO bachelor	2.6
UE	61	UE master, PhD	3.3
Total	44		

Source: ROA (2007), Statistics Netherlands Statline (2007)

The Netherlands Bureau for Economic Policy Analysis performs regular analysis to establish the demand and supply of workers by social and demographic types. One such analysis is "Labour supply by social-demographic characteristics" (published in 2006, only available in Dutch). The combined job centres run by the government, represented in the Centres for Work and Income (*Centrum voor Werk en Inkomen* or CWI), collect data on vacancies. Partly based on these data and based on the ROA and other government agencies' economic

analyses, the Council for Work and Income (*Raad voor Werk en Inkomen*) publishes labour market analyses and forecasts. These also show a continued high demand for graduates, partly as a result of the ageing of the Dutch society (replacement effect) and the changing structure of the Dutch economy.

2.3 Governance and the regulatory framework

The Netherlands aspires to use its tertiary education resources to help it move into a European leadership position among knowledge-based economies by 2010. The government has strategies to achieve this goal, which are set out in policy documents. The most recent strategic agenda, *Het Hoogste Goed* (MinOCW, 2007b) outlines "an ambitious culture of learning" and "an excellent research climate" as the key objectives for the years to come.

The official central government philosophy since the *Hoger Onderwijs Autonomie en Kwaliteit* (HOAK) policy paper has been to have as little central steering as possible, given the goals to be achieved (Jonge and Berger, 2006: 72). This is also known as the 'state supervisary model' as opposed to the 'state control model'. The described philosophy is expressed in the *Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek* (WHW) (Law on Higher Education and Scientific Research), first issued in 1992 and frequently adapted since.

2.3.1 Federal governance

Four ministries – the ministry of Finance, the ministry of Economic Affairs, the ministry of Education, Culture and Science and the ministry of Agriculture, Nature and Food Quality – are involved in formulating and executing tertiary education policy and resourcing toward this end (OECD, 2008a: 19). The Ministry of Education, Culture and Science assumes primary responsibility for national funding, programmes and policy advice in higher education. The ministry of Agriculture, Nature and Food Quality is responsible for the institutions within the domain of agriculture and natural environment. Apart from the ministries, there is also a great deal of advisory bodies, consultative bodies, intermediary organisations and interest groups that influence policy-making. The next paragraph discusses the most important of these organisations. A more complete list can be found in appendix 1.

2.3.2 Advisory bodies

The Education Council (*Onderwijsraad*) is a permanent advisory body established by the Act of Parliament in 1919. It provides advice, both solicited and unsolicited, to the Minister of Education, Sciences and Cultural Affairs and the Minister of Agriculture, Nature and Food Quality (Onderwijsraad, 2009). Other bodies which advice the government on science and education are: the Socio-Economic Council (SER), the Advisory Council of Government Policy (WRR), and the Advisory Council for Science and Technology (AWT).

2.3.3 Consultative bodies

With regard to higher education, the Minister consults within the Higher Education Consultative Committee (*HO Kamer*) with the HPE Council (*HBO-raad*), Association of Universities (*VSNU*) and teaching hospitals and with the national research organisations (Weert and Broezerooy, 2007: 56). The national student organisations also have a say in higher education policy through the Student Consultative Committee (*Studentenkamer*).

2.3.4 Intermediary organisations

The largest intermediary organisations providing funding for research at higher education institutions are the Netherlands Organisation for Scientific Research (NWO) and the Royal Netherlands Academy of Arts and Sciences (KNAW). In addition, these two organisations also perform research. The NWO is the most important intermediate organisation in the field of fundamental and strategic scientific research. It is responsible for enhancing the quality and innovative nature of scientific research at Dutch universities and research institutes. To help it achieve these aims NWO receives funding of around EUR 480 million from the government (NWO, 2007: 73, 94). The Royal Netherlands Academy of Arts and Sciences' (KNAW) main objective is to advise the government on matters related to scientific research. The KNAW's budget is about EUR 135 million, mainly provided for in the form of government subsidies (KNAW, 2007: 124).

2.3.5 Interest groups

There are a number of interest groups attempting to influence higher education policies through lobbying and negotiating with the government. The most important ones are the employers' organisations and the labour unions. Two main organisations represent the interests of the employers: the Confederation of Netherlands Industry and Employers (VNO-NCW) and the Royal Association MKB Nederland (SME). The interests of the employees are promoted by the labour unions, of which the largest are the Federation of Dutch Labour Unions (FNV) and the National Federation of Christian Trade Unions (CNV).

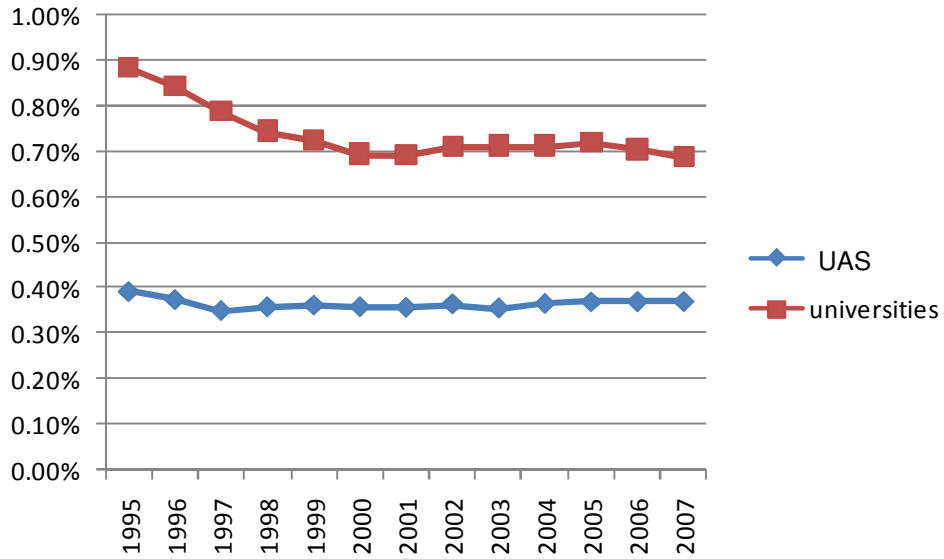
2.3.6 Funding

There are two major sources of income for institutions of higher education: public funding and private contributions from students and businesses. The universities speak of three budget streams: two public ones and one private one:

- Public formula funding goes directly to institutions of higher education for all their tasks (first stream);
- Another stream of public funding goes via the research councils (NWO, KNAW) to research proposals in competition (second stream);
- Private income from tuition fees, commissioned research or other tasks (third stream), business.

In addition to the above funding streams, students also pay tuition fees. The first stream of funds represents the core funding of the HEIs. The Ministry of Education, Culture and Science supplies the first flow of funds for both the universities and the UAS. Agricultural institutions (one university and six UAS) receive their grant from the Ministry of Agriculture (Weert and Broezerooy, 2007: 45). As Figure 2.7 shows, public expenditure on higher education has been decreasing steadily (relatively to GDP) for the past decade. In this respect, the research universities have encountered the steepest drop in public funding support. In 2007, the institutional support from public sources was approximately EUR 6 billion (Statistics Netherlands Statline, 2008). This represents an estimated 79% of total support, with approximately 21% provided by private sources such as tuition fees and private contributions (OECD, 2008a: 41). Private support for institutions from tuition fee income and private contributions has been increasing slowly. A decade ago, private support made up approximately 19% compared to the current 21% (OECD, 2008ab). In addition to publicly funded universities and UAS, there are a number of "designated" institutions formally part of the higher education system. Their educational programmes are officially recognized but they do not receive funding from the government, although their students are eligible for student financial support (Weert and Broezerooy, 2007: 43).

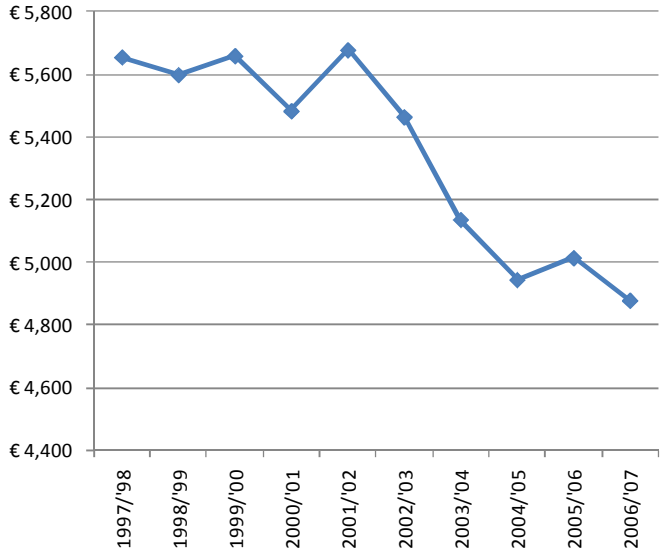
Figure 2.7 Public funding of HEI's (% of GDP)



Source: Statistics Netherlands Statline (2008)

First stream funding consists of four components: an educational budget, a research budget, facilities for medical students and facilities for university medical hospitals. As was pointed previously, the publicly funded educational budget of universities has remained more or less stable over the past decade. In real terms, the publicly funded educational budget of universities has increased only slightly from EUR 3.0 billion in 1998 to EUR 3.2 billion in 2006 (VSNU, 2008d). Over the same period student numbers have increased from 289,000 to 367,000. This implies a steep decline in the publicly funded educational budget per student, as is illustrated in figure 2.8. The publicly funded research budget of universities has even declined in real terms over the last decade, from EUR 1.6 billion in 1998 to EUR 1.5 billion in 2006 (ibid, also see Versleijen et al., 2007).

Figure 2.8 Publicly funded educational budget of universities (per student)



Source: VSNU (2009d)

An overview of the absolute size of the different funding streams received by HEIs in the Rotterdam Metropolitan Area is given in Table 2.6.

Table 2.6 Funding of HEIs in the Rotterdam Metropolitan Area by budget stream (in million euros)

	Total income	1st stream	2nd stream	3rd stream
Erasmus University*, 2008	439	241.1	17.4	180.5
TU Delft, 2008	499.1	369.3**	30.3	99.5
INHolland University, 2007***	265.9	188.5	-	77.4
Rotterdam University	200.6	177.3	-	23.3

Source: Administration individidual HEI's

* Funding of Erasmus University includes funding of Erasmus MC

** including 25 millon euros due to faculty fire

*** This contains the total funding of INHolland Netherlands and not just INHolland Rotterdam

Over the past decade, institutions have gained more autonomy, including ownership of their own campuses and capital facilities. Formula-based, lump-sum budgeting has replaced a more centralized, regulatory approach. The lump sum allocations (first stream) are based on relatively simple formulas for distribution of financial support between both types of institutions in the binary system. For universities, these lump-sum amounts of public funding consist of a teaching component and a research component. Institutions' teaching budgets, exclusive of research, are made up of a base funding component, representing 37%, a performance component calculated from the number of diplomas, representing 50%, and a component based on the number of first year students, representing 13% (OECD, 2008a: 42). These relative shares are fixed, which means that in absolute terms the budgets for HEIs are fluctuating in accordance with the number of diplomas awarded and the number of first-year students. With respect to the research component, most funds are fixed allocations per university, based on historical reasons (Weert and Broezerooy, 2007: 52). However, with the introduction of the Bachelor-Master model, the link between the research budget and the number of diplomas (both Bachelors and Masters) has been reintroduced (ibid: 52). For UAS, total enrolment is used in the calculations and dropouts are considered as well as students receiving diplomas. Another factor, to improve UAS efficiency, is added to the formula to encourage timely completion. UAS traditionally do not receive research funds, although since recently there is governmental budget support for senior lecturers (ibid: 42).

The current funding framework of HEIs has a number of characteristics impeding competition within the higher education sector. First of all, only approximately 10% of public research funding consists of funding allocated on academic grounds by the principal research funding agency, based on the evaluation of research excellence and competitive funding for projects and programmes (OECD, 2008a: 27). Secondly, the tuition fees are set at the national level (for the academic year 2008-09 the standard fee is EUR 1565), which limits the financing possibilities on the revenue side of HEIs' budgets. In 2006, the then state secretary for the Ministry of Education, Culture and Science proposed a new funding structure to transform the Dutch higher education system into a more differentiated and market-driven system where students and institutions would obtain more freedom and more responsibility (MinOCW, 2006b). Central to this system was the provision of learning entitlements allowing students to 'cash' their entitlements for (parts of) education at any place and time (Weert and Broezerooy, 2007: 53). The concept aimed to increase the freedom and flexibility of students in choosing an institution to follow a Bachelor or Master programme. While the system of learning entitlements was originally scheduled for the academic year 2007-2008, the current government has opposed the plans. The government not only funds the HEIs, also students get funding. Therefore a grant system has been established.

The Dutch student grant system

The Dutch government has designed a student grant system. Students in full-time higher education in the Netherlands may be eligible for a student grant. They must satisfy the following three requirements:

- Age: students must be under the age of 30 when they become entitled to a student grant;
- Nationality: students must be of Dutch nationality or have the same rights;
- Education: students must be in full-time or dual education.

Students that fail to meet the nationality requirement but are under the age of 30 and do come from a country in the EU/EEA or Switzerland can apply for limited funding.

A student grant for higher education is paid in the form of a performance-related grant. The performance-related grant is a loan which is converted into a gift if the student obtains a diploma within a ten-year period. For attending a four-year course, a student will receive a performance-related grant for four years. After these four years, that student may exclusively borrow for a further three years.

For all students, the performance-related grant consists of a basic grant and a special student card given them free access to public transportation throughout the country. Depending on their parents' income, some students are also eligible for a supplementary grant. In addition to the performance-related grant, students can borrow money in the form of a loan and/or a tuition-fee loan.

The Dutch government stipulates the student grant levels each year. In 2009 the monthly basic grant for students living away from their parental home is € 259,76, plus € 233,27 as a supplementary grant, € 282,35 in the forms of a loan and a € 135,00 tuition fee loan. For students living at home the amounts for the basic grant are lower (in 2009 € 93,23).
Students must begin repayments two years after their right as a student grant comes to an end. The IB-Groep organizes the student grants and calculates the relevant monthly instalment. These monthly instalments should enable students to repay their loan in full within fifteen years. The minimum repayment is € 45.41 per month.

For students receiving a student grant, an earnings limit applies. In 2009 they may earn a maximum of € 13.215,83 in supplementary income.

2.4 Regional dimension 'inside' the national higher education policy

The Netherlands is a relatively small country with 14 research universities and 40 government-funded UAS located within its territory. In more or less every region access to higher education is adequate. The location of most HEIs has a historical background that goes back for decades if not centuries. In the 1960s the government founded some new universities (Twente and Maastricht) with the aim of developing the regions concerned. Since then a policy of de-regulation of higher education has started. A high level of autonomy nowadays characterizes the Dutch system for higher education for HEIs. HEIs have control and ownership of their campuses and finances. Due to lump-sum budgeting they can set their own goals and strategy to achieve their goals. The national governments' role has shifted from a state control model, prescribing the activities of HEIs, to a more detached supervisory model, involving evaluation of output. The state has no role in the content or location of new studies programmes and courses. The government merely checks the relevance to the (national) labour market or unwanted competition with existing studies within the region where a new field of study is put forward for funding. The Netherlands-Flanders Accreditation Organisation (NVAO) checks the quality. It is argued that the process of de-regulation leads to more regional involvement. According to the OECD (2008a: 42), "de-regulation of tertiary

education has allowed institutions more flexibility and seems to be paying off with increased institutional cooperation and innovation. Institutions have merged with one another, worked together to create more programmes bases on student's needs, and developed better working relationships in their respective regions, according to anecdotal evidence gathered in numerous interviews with institutional administrators." Due to the autonomy of the HEIs there is not a specific regional dimension in the Dutch higher education policy. It depends on the individual HEI to what extent they focus on the region. Along the same lines, Sijgers et al. (2005) concluded that regional considerations only played a minor role in policy-making. This role is slightly more developed for UAS, due to their function to educate professionals for the labour market. Conversely, research universities focus more on the advancement of research skills in particular.

Earlier in this chapter it was emphasized that a few years ago *senior lectureships* have been introduced in the higher education system. This is an important development within UAS and for their contacts with the region. With these senior lectureships UAS can work on their relation with the regional labour market and corporate life. UAS are explicitly assigned to develop to a knowledge partner of the professional practice in a broad association. This brings UAS closer to corporate life (and local government).

A good example of this in Rotterdam is the Trans-urban knowledge centre of the HS Rotterdam in which five *senior lectureships* are involved. This UAS positions itself not only as an educational institute but also as a knowledge institute for strategic labour issues in the Rotterdam area. The knowledge centre aims specifically at Rotterdam metropolitan issues: urban innovation, opportunities and threats of the water household, transition of port and city, logistical processes of products and services, and the development of the urban infrastructure and mobility. By positioning itself as a regional knowledge centre for corporate life, government and 'not for profit' organisations on these issues, the trans-urban knowledge centre as well as the UAS have established a permanent relation with the profession/labour market and society.

Other examples of these kinds of *senior lectureships* allied to the regions are the knowledge circle, Growing up in the city and the *senior lectureship* Ideal Port. The knowledge circle aims at the environment of children, youngsters and adolescents growing up in a conurbation like Rotterdam and the Rotterdam region. The *senior lectureship* Ideal Port combines and facilitates the joint objectives of the *Havenbedrijf (port)* and UAS on education in the field, so they can generate research results relevant to in the port. Annex 4 gives an overview of the *senior lectureships* in Rotterdam.

Although there is no explicit regional dimension in the Dutch policy framework on higher education, there are still some programmes to stimulate the cooperation of HEIs with other HEIs (research universities and UAS), local government and local corporate life (i.e. SME). Examples of these are Pieken in de Delta, RAAK and the funding of structures for the local educational labour market (teacher academies and the schools –as employers- in areas with a high expected shortage of teachers for primary or secondary education are stimulated to work together towards solutions for their local situation).

Pieken in de Delta

In 2004 the Ministry of Economic Affairs launched *Pieken in de Delta*, a policy to strengthen the national economy by focusing on specific areas with potential. In these areas there is a key role for knowledge institutions like HEIs. According to Pieken in de Delta the priorities are business parks, main ports (Amsterdam Airport and the Port of Rotterdam), infrastructure, innovation and urban economies (MinEZ, 2004). One of the designated areas is the Southern part of the Randstad and both Delft and Rotterdam are part of this area. Public transport and infrastructure will be improved, Rotterdam Port will be better positioned and another subject where HEIs can work on: helping the young labour force (with a lot of immigrants) to benefit from the economic growth (although there is no growth at this time, the role for HEI's is still or maybe even more, important). More information can be found in chapter three.

RAAK

The Regional Action and Attention for Knowledge Innovation (RAAK) is an arrangement of the Department of Education (Stichting Innovatie Alliantie, 2009). It intends to strengthen the relationship between UAS, regional training centres and SME to transfer knowledge (OECD, 2008a: 74). Approximately EUR 6-8 million is available on a yearly basis. Lately RAAK has been broadened to include the public sector. The recent evaluation study of RAAK 2005-2008 (SIA, 2009) shows that RAAK has been well implemented by all participants. It has contributed to the development of HEIs to knowledge institutes. According to the study, HEIs have significantly improved their visibility in the regional knowledge and innovation networks.

The Dutch associations for UAS and research universities, the HBO-raad and VSNU, respectively, also stimulate their members (the HEIs) to cooperate on a local level, although the decision is up to the HEI itself. In the Green Paper *Towards A New Organizational Agenda*, the HBO-raad voices its expectation that there will be a broad variance within institutions (HBO-raad, 2009c). Some will focus on international development, while others will focus on cooperation with secondary education and companies in their region. Furthermore, the VSNU and HBO-raad along with many other organizations, such as employers organizations for multinationals and SME, signed a declaration in 2007 known as "*Kennis Verzilveren"* to work together on the development of exploitation of knowledge. The Ministry of Education, Culture and Science (OCW) states in its strategic agenda for higher education, research and science policy, *Het Hoogste Goed*, that the cooperation between HEIs and corporate and social organizations should be strengthened (MinOCW, 2007b). Both institutions can learn from each other and it is important to ensure that action taken is compatible with the time scale of labour market fluctuations.

2.5 Regional higher education system and governance

In the Netherlands the governance of higher education is predominantly a national affair. It is the Minister of Education (OCW) who is ultimately responsible for the proper functioning of the HE system. The most recent strategic agenda for higher education (MinOCW, 2007b) shows that the Dutch government aims to strengthen the autonomy of the HEIs as the executive bodies of this strategy, stating that the role of the government should be one of securing the right framework conditions to safeguard the public goals of higher education, such the quality, accessibility and efficiency of higher education.

This governance structure means that there is no official role in higher education for other governmental layers such as the provinces or the city councils. By and large the Rotterdam HEIs are autonomous organizations. They operate in a national legal framework and receive the main part of their budget directly from the ministry of education. This makes the minister of education their main 'principal'.

3 CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

Stimulating innovation is one of the key policy areas for the central and regional governments in the Netherlands. The best impetus for innovation is cooperation and sharing of knowledge. A spatial component of cooperation is visible through the formation of clusters. For future growth innovating clusters of businesses are particularly important. Within a globalising market and an expanding EU it is becoming increasingly difficult for Dutch companies to distinguish themselves through low costs. The need for knowledge intensive products and processes is an essential component to be able to compete. From an economic-theoretical perspective reason, there is reason to stimulate the development and dissemination of knowledge and innovation. However, the Dutch market fails to achieve this.

Cooperation between businesses and knowledge institutions plays an important role in the chances of success in innovation. So called 'open innovation'[14] enforces the effectiveness and efficiency of the innovation process. For this the presence of knowledge workers is vital. Knowledge institutions (in particular HEIs) are recognised as the 'motor for innovation' and deliver a continuing flow of knowledge workers each year, ready to join the labour market. Case studies[15] in other countries have shows that good cooperation between HEIs, R&D-institutions, local businesses and regional government results in a stronger knowledge base in the region. Geographical presence and face-to-face contact stimulates cooperation. Arvantis, Sydo and Woerter (2008) refer to this:

> "Knowledge and Technology Transfer activities with research institution and/or institutions of higher education seem to improve considerably the innovation performance of firms both in terms of R&D intensity and sales of new products" (p.90).

This chapter will explore the policies and programmes set up to stimulate cooperation between knowledge institutions, governments and businesses in the Rotterdam and Delft region. What is the view of different parties on cooperation and have there been any spin-offs from programmes set up to stimulate innovations and knowledge sharing? What is going well and what can be improved to strengthen the region as a knowledge base?

[14] Open innovation: combining internal and external sources for development as well as the marketing of new technologies and products (www.openinnovatie.nl)

[15] For example in Melbourne, for this see: Yigitcanlar, O'Conner & Westerman (2008). "The making of knowledge cities: Melbourne's knowledge-based urban development experience

3.1 Vision and policy towards regional innovation

3.1.1 Governance policy

National policy

Within the Netherlands there is a clear regional innovation agenda set by the national government. Although older and other policies exist, Pieken in de Delta is one of the most important policies for Rotterdam. This policy made by the Ministry of Economic Affairs, consists of six regional programmes and covers the period 2006-2010. One of these programmes is directed at the Zuidvleugel of the Randstad. For this area the stimulation and facilitation of high-potential clusters and sectors is given priority. In the Zuidvleugel the following clusters are being supported:

- Port and Industrial complex
- Suppliers of Greenhouse farming
- International Law, Peace and Order
- Life & Health Sciences

Another important piece of legislation for Rotterdam is the valorisation agenda commissioned by the Innovation Platform and the interdepartmental programme management Knowledge and Innovation. This national valorisation-agenda 'Van voornemens naar voorsprong: Kennis moet circuleren, Voorstel voor een Nederlandse valorisatieagenda', contains many examples of measures and analyses relevant for the region of Rotterdam. The main objective is that valorisation needs to be addressed in a long-term manner and also needs long term financial support from the national government. Collaboration between EUR and TU in the field of entrepreneurship (HOPE) and the Port of Rotterdam is an example of this. A summary of this valorisation-policy is provided in annex 2.

(Sub) regional and local policies

The regional and local innovation policy, at the level of province, city-region and municipalities, is largely an elaboration of the national and European investment programmes and as such part of the national and European innovation-agenda. These national programmes are tailor-made to fit the strategic goals at the regional level and match the existing knowledge and chances within the region. In theory, this should guarantee that national programmes fit within the needs of the knowledge institutions in the region.

3.1.2 Institutional perspective

The HEIs in the Rotterdam region differ from universities in terms of their regional orientation. Universities are more orientated on a national and international level whilst the UAS are more focused on the region itself.

However, all the knowledge institutions have developed a policy directed at stimulating knowledge transfers and sharing information with other stakeholders in the region. The impetus of this policy is that in order to create a healthy and powerful institution, strong embeddings in the region is vital. This strong embedding within the region helps the positioning of the institution, results in more research resources and students and stimulates cooperation between other institutions and the regional business community.

Within all the knowledge institutions this vision is translated into a strategy, key values, instruments and organisational services. This translation of vision expresses the differences between the institutions. In reality and in the education programme of the UAS, local linkages are more present than at universities, where local projects are often individual initiatives. However, recent examples of interfaculty cooperation show more local interaction at universities. An example of this is the cooperation with the Delft Research Initiatives on

energy, environment and infrastructure with the RCI/RCC and the Smart Port initiative (EUR-RSM, EUR-ESE, Port Authority and Deltalinqs), and other initiatives mentioned further on.

When it comes to setting the agenda, prioritisation of subjects and the organisation of linkages with the business community, the implementation of the visions, strategies and direction have all been set up within their own context and interests.

All institutions benefit from a joint evaluation of the different visions, a check for consistency and search for possibilities of cooperation, resulting in the formulation of a common direction.

3.1.3 Vision and policy of businesses

Several ambitious initiatives for cooperation between institutes and the market can be distinguished (e.g. Yes! Delft, HOPE, EDBR, Pact op Zuid, New Trade Lab, Medical Delta). These are quite recent and carry high potential. Universities like EUR and TU Delft still have to make sure that the mutual ambitions set will result in further cooperation in their field. The organizing capacity of businesses is low and innovation does not seem to be a priority for representatives of business (e.g. Chamber of Commerce).

3.1.4 Conclusion

Overall the HEIs share a similar perspective but apply a different approach. These differences can be explained by the organisational structure and vision of each individual institution but as such do not lead to an optimal result for the region. It creates a loss of transparency from the perspective of regional partners and the business community. This is enforced by the lack of familiarity and knowledge on the structure of knowledge institutions in order to find the right expertise quickly.

Stimulation of innovation and cooperation is mainly targeted by national policy. The national government has set the agenda at this level. The nota valorisation policy shows:

- There is no joint direction of strategy and continuity in valorisation policy by the government;
- Because the lack of a joint and long term strategy, valorisation instruments remain fragmented;
- Policy instruments are not the same resulting in different problems, pre-conditions and set of rules on different levels.

On a local level many government initiatives match the local innovative ambitions. The government however is not on the fore enough as a director of the innovation agenda and in creating civitas (stimulating the right environment). Local stakeholders are not always involved (including the knowledge institutions) in incorporating and putting the policy into practice. However, within the EDBR (the local government advisory board), the HEIs are represented as well. The question is, depending on the policy area, if the available knowledge is being used optimally.

3.2 Interfaces facilitating knowledge exploitation and exchange

Different programmes have been set up to promote knowledge exploitation and exchange to strengthen the innovation climate. This is done on a national level as well as on a regional level. The knowledge institutions take part in the different programmes but also create their own initiatives.

3.2.1 Knowledge institutions

In order to improve their embedding within the region a spectrum of instruments is being used, generic and specific, through funding and organisational services (e.g. senior lectureships) and through agreements on cooperation.

University

Within the EUR these relationships often exist on faculty or inter-faculty level in varying degrees. Many contacts exist with individual businesses but also via Ltd's (group of businesses, 'BVs', such as Risbo, Erasmus Academie, Eurac, RHV BV). The EUR is involved in regional cooperation schemes such as Kennisalliantie and HOPE, the Erasmus MC takes part in B2SP and both take part in Medical Delta. The Technology Transfer Office (TTO) of the Erasmus MC (academic hospital and medical faculty) contributes largely in important innovative spin-offs in Rotterdam (see: best practice Technology Transfer Office). Research on various EUR-faculties (RSM, ESE, ESL) supports innovation in the fields of logistics, port, shipping, transport and maritime economics, shipping and maritime law, and urban and regional development.

TUD also puts into action a diverse package of measures and services to stimulate local cooperation and the dissemination of knowledge and innovation. A key-institute is the valorisation centre within the TU Delft. TUD is, like the EUR, involved in regional cooperation schemes such as Kennisalliantie, HOPE and B2SP and a number of other innovation programmes (linked to themes like the port, climate, energy and greenports). During the last five years more than 60 techno-starters were set up, the majority of these grow faster than expected and is are in the Delft/Rotterdam region. The collaboration recently established with Exact is another example.

UAS

The UAS stimulate cooperation and innovation through counters where businesses can ask questions and the institutions can demonstrate their talent. UAS also have 'senior lectureships', participate in cooperation projects in a diversity of themes related to innovation and take part in regional projects like Kennisalliantie. However, a recent study of some Dutch HEIs (outside Rotterdam) showed that less than 41 % of the 'senior lectureships' is intensively in touch with the business community[16]. This is a fairly limited number. Our impression for the situation in Rotterdam is that during the existence of a senior lectureship more intensive cooperation with the business community is sought. The level of intensity depends somewhat on the type of senior lectureship (in relation to the market sector).

[16] RUG & NICIS, 2009. "Kenniscirculatie in de regio: de rol van het HBO, relaties met het bedrijfsleven en het HBO". Publisher: Faculteit Ruimtelijke Wetenschappen and NICIS Institute.

Best practice:

Holland Program on Entrepreneurship (HOPE)

Through this programme Erasmus University Rotterdam, Delft University of Technology and Leiden University want to develop a strong and innovative centre for entrepreneurship. The centre will embed 'learning how to do business' within the educational programmes of all three universities together as well as for the individual universities.

Within HOPE there will be a coherent programme for entrepreneurship, in which all students can take part. This programme will focus on new combinations and cooperation programmes between disciplines, studies, students and entrepreneurs, companies and researchers or tutors.

Goals of HOPE are:

- Expansion and renewal of education geared towards a challenging content, type of classes and learning environment;
- Stimulate an entrepreneurial culture at universities.

To reach these goals HOPE, together with partners from business and government, has developed a set of common activities for the three universities. The cooperating parties will bundle and exchange their knowledge and expertise, and share this with students.

The goals of HOPE are being translated into the following educational activities:

- Creating awareness of the possibilities and the importance of entrepreneurship, entrepreneurial skills;
- Experience and get a taste from all aspects regarding entrepreneurship;
- Gain more in-depth knowledge and skills;
- Experience entrepreneurship in a practical setting.

Cooperation between partners, business and government is crucial in order to reach synergy. Through HOPE, companies have permanent access to knowledge. Moreover, HOPE's goal is to strongly expand the efforts and results regarding knowledge valorisation for the next ten years.

3.2.2 National programmes

The most important national programmes to Rotterdam have been mentioned in paragraph 1, these are Pieken in de Delta and the valorisation-agenda. However there are more programmes relevant to the region that have been set up nationally but implemented regionally. That is why these programmes will be discussed in the next paragraph.

3.2.3 (Sub) regional programmes

There are a number of programmes at the (sub) regional level that support and stimulate knowledge sharing and innovation between the knowledge institutions, governments and the business community. We will now discuss the following programmes:

- Kansen voor West (Chances for West)
- Pieken in de Delta: Zuidvleugel
- Clusterregeling Provincie Zuid-Holland (cluster-agreement)
- Kennisalliantie: Ondersteuning bij Innovatie (support with innovation)
- Dutch Clean Tech Delta

Programme: Kansen voor West (Chances for West)

The so-called 'Western region' of the Netherlands, consisting of the provinces Noord-Holland, Zuid-Holland, Utrecht and Flevoland, has submitted a programme to receive EFRO-funding (European Fund for Regional Development). This programme called Kansen voor West, focuses on three priorities in which 'Knowledge, innovation and entrepreneurship' is the largest of the three.

The programme Kansen voor West has within each province and the G4 (the four biggest cities of NL) eight support-centres. One of the selection criteria is that submitted projects fit within the national, regional and local agendas. For this, contact with a local support-centre in an early phase is an important step in the process. Submitted projects within the priority 'Knowledge, innovation and entrepreneurship' are judged on the following criteria: does it strengthen the high-potential clusters through knowledge-development, -transfers and –implementation in practice; does the project stimulate entrepreneurship and innovativeness in small businesses; and does it stimulate technological environmental-innovations?
Projects within this priority-area need to ask for a minimum funding of € 200.000. In practice this means the project comprises a minimum amount of € 500.000. TU Delft was successful in receiving funds for two large programmes, one related to the support of start-ups in their growth phase and one related to the so-called Technopolis Accelarator, a new building for start-ups and spin-offs. Kansen voor West will run from 2007-2013 and all projects that are supported have to be finished within this timeframe[17].

Programme: Pieken in de Delta: Zuidvleugel

Pieken in de Delta is the national agenda for regional development. This programme is supported and directed by the Ministry of Economics Affairs. This agenda consists of six regional programmes and covers the period 2006-2010. One of these programmes is directed at the Zuidvleugel (Southwing of the Randstad). The core intension is to stimulate high-potential clusters and sectors. In the Zuidvleugel the following clusters are being supported:

- Port and Industrial complex
- Suppliers of Greenhouse farming
- International Law, Peace and Order
- Life & Health Sciences

Pieken in de Delta supports projects aimed at structure-reinforcement and R&D. Projects have to be executed through cooperation of several parties. Each year there are two periods for tendering. The project needs to be of such a size that a minimum amount of €500.000 of funding can be rewarded. An example of regional collaboration being funded by Pieken in the Delta is the so-called Greenport Campus. After 2010 the implementation of Pieken in de Delta will become more regionally focused (according to the agreement between the central government and the provinces)[18].

During 2006, 2007 and 2008, the total amount of national subsidy, co-financing from the municipality and costs of participants added up to 17,4 million Euros. This covered 11 projects in the area of the Zuidvleugel.

[17] For more information on this project, check: www.kansenvoorwest.nl.

[18] More information can be found on the following websites: http://www.ez.nl/Onderwerpen/Overig/PID_Zuidvleugel_Randstad and http://www.senternovem.nl/pid/.

Best practice:

Kennisalliantie: Ondersteuning bij Innovatie (Support on Innovation)

So far all the programmes mentioned involve the cooperation of multiple parties. This enhances the complex process of developing an innovative project which requires specials skills. Because of this, many entrepreneurs experience difficulties in independently starting a good project plan and submitting a correct fund application. An employee of Erasmus MC has been appointed to the Kennisalliantie to act as cluster coordinator for Health & Life sciences.

To support entrepreneurs and researchers with the development of a good project plan and a correct fund application Kennisalliantie and Syntens have organised the programme Ondersteuning bij Innovatie (Support on Innovation). This programme is supported by EFRO-funding 'Kansen voor West'. The aim of the programme is to strengthen the networks of clusters within Zuid-Holland and to support the development of innovative projects.

Programme: Medical Delta

Delft University of Technology, Erasmus University Rotterdam, Erasmus MC, Leiden University and Leiden University Medical Centre (LUMC) have formed a consortium with a range of industrial partners (companies Cardialysis, Medis, Bioimaging Technologies, Oldelft, Linoview Systems, Cyclotron, Astellas Europe and Mallinckrodt) to establish a Medical Delta in the west of the Netherlands. The Medical Delta initiative was established in 2005 and has resulted in twelve cooperation projects with a total turnover of more than € 13 million. The national government, regional governments (regional economic policy 'Pieken in de Delta'), industry and the academic institutes themselves finance the initiative.

Medical scientists and engineers joined forces to push the state-of-the-art forward in health sciences and medical technology. The cooperation is founded as a permanent new player within the Dutch field of health care and economy. Medical Delta contributes to:

- Quality and safety of health care;
- Effectiveness of health care (by increasing labour productivity)
- Make the most of economic opportunities.

Medical Delta aims to reach its goals by executing leading research and development, smart implementation of scientific results within the market and common education of people at different levels.

Programme: Clusterregeling Provincie Zuid-Holland (cluster-agreement)

The Clusterregeling is an agreement controlled by the province of Zuid-Holland aimed at supporting innovative projects in the four priority clusters of the province:

- Greenports
- Life & Health Sciences
- Transport & Logistics
- Water- and Delta technology

The Clusterregeling supports innovative projects by cooperating businesses and knowledge institutions. The maximum amount of funding that can be rewarded can also depend on the number of parties involved in the cooperation. Minimum project size is €500.000[19].

[19] For more information check: http://www.zuid-holland.nl/overzicht_alle_themas/thema_economie_werk/c_e_thema_economie-innovatieve_clusters.htm

Best practice:

Dutch Clean Tech Delta

The Dutch Clean Tech Delta foundation connects and strengthens initiatives in the delta of South-Holland in the field of *delta technology* and *energy transition*. Dutch Clean Tech Delta's primary mission is to connect, strengthen, intensify and promote the expertise and innovation power of de delta of South-Holland in the areas of *sustainable energy, sustainable mobility and vital, sustainable living environments.* Its goal is to develop the Rotterdam, Delft and Drechtsteden region as international leader of sustainable economy.

To reach this goal, the foundation will undertake several activities, such as:
Coordinate and connect;
Develop a vision and strategy together with stakeholders from business, knowledge institutions and regional government;
Promote and distribute knowledge.

Dutch Clean Tech Delta is a linking concept for Science Port Holland (SPH) and the Rotterdam Climate Campus (RCC). The foundation is being managed by a high-level executive committee. This committee consists of stakeholders from Dutch Clean Tech Delta: businesses (e.g. Shell, DSM, IBM, EON, Port of Rotterdam, etc.), knowledge institutes (Erasmus University Rotterdam and TU Delft) and government (mayors of Rotterdam and Delft, Provincial Executive of South-Holland). Furthermore, other stakeholders and experts will be added to the Advisory Council.

3.2.4 Local programmes

The municipality of Rotterdam does not have its own innovation-agenda but does have different programmes directed at innovation and cooperation with the knowledge institutions and the business community. Good examples are the Rotterdam Climate Initiative, including the Rotterdam Climate Campus, the RDM Campus and the Rotterdam Climate and Innovation Fund (RCIF), which is in the processes of being founded. Another example is the Medical Delta (this programme is part of Pieken in de Delta) and the Technology Transfer Office (TTO) / Rotterdam Science Tower.

Programme: Rotterdam Climate Initiative

Here we provide some general introduction of the RCI and the role of knowledge institutions, governments and businesses. Further information be found in paragraph 5.2.1.

Part of this initiative and discussed in the following order are:

1. Rotterdam Climate Campus
2. Research, Design and Manufacturing (RDM) Campus
3. Rotterdam Climate and Innovation Fund

1. Rotterdam Climate Campus

On the 21st of September 2009 an agreement was signed between the partners of the RCC, which is a collaboration between the city of Rotterdam, universities and businesses.

2. Research, Design and Manufacturing (RDM) Campus

Together with the Rotterdam Port Authority, a consortium of Rotterdam University, Albeda College and Woonbron developed the premises of the former 'Rotterdam Dry Dock Company' (RDM) into a cluster of innovative manufacturing industry for companies, entrepreneurs, knowledge institutions and educational institutions in the Rijnmond region. By

creating an alliance of companies and knowledge institutes, the initiators want to bring new life to RDM, using the motto: Research, Design and Manufacturing. The area leaves room for innovation, especially to close the gap between education and business . RDM Innovation Dock (hall for machinery), 'Droogdok 17', 'Dokhaven' and RDM Village (cluster of facilities) form physical parts of the RDM Campus.

Goals of the RDM Campus are:

- Realisation of a cluster for innovative manufacturing industry in Rotterdam, for the themes building, moving and powering;
- Realisation of knowledge circulation between education and business, resulting in a new economic activity: new entrepreneurs and introduction of new products and services to the market;
- Realisation of cross linkages between creative industry and technology;
- Realisation of an inspiring and attractive working environment for businesses.

Best practice:

RDM Innovation Dock

RDM Innovation Dock is part of the RDM Campus and its goal is to connect practical research and innovation & entrepreneurship. The *Applied Tech* activities provide an impulse to the innovative manufacturing industry: students realise, together with or guided by professionals from participating companies, innovative product concepts and production processes. This learning environment is meant to support and stimulate students to gain, develop, share and apply knowledge. The strong focus on innovative businesses strengthens the component of 'entrepreneurship' within their education. RDM Innovation Dock is a shed which offers room for MBO, HBO and business to meet. Attracting companies is crucial for the success of RDM Innovation Dock. Therefore, a certain degree of integration between educational institutions, offices and business accommodation is needed.

RDM Innovation Dock is aimed at three market areas:

- Building: sustainable on land and water;
- Moving: smart mobility and automotive technology
- Powering: energy technology and sustainable energy (including application).

The above mentioned market areas share one common factor, which is summarised in the term *sustainability*. RDM Innovation Dock may be regarded as an outcome of the Rotterdam Climate Initiative.

In their cooperation, Rotterdam University and Albeda College apply a new concept of knowledge circulation. Students and professionals work together on assignments within Knowledge Creation and Circulation teams. Within these teams new competences from education and best practices from businesses are exchanged. What characterises this approach is that knowledge circulation takes place both at horizontal and at vertical level.

3. Rotterdam Climate and Innovation Fund

The Rotterdam Climate and Innovation Fund (RICF) is an initiative under development directed by the municipality of Rotterdam and business partners. This new fund supports innovation and climate initiatives. The RICF invests in businesses and business initiatives involving the production/development of innovative products, services and technologies. These initiatives should underpin sustainability and relate to the energy and climate pillar set in Rotterdam (both port and city). The majority of these investments are to be spent in university spin-offs and start-ups.

The RICF is a growth-fund aiming for a capital of 18 to 20 million euro and will be executed in two tranches. The first tranche contains an amount that serves investments in small but high-potential innovative businesses. Immediately following up the start of tranche one, tranche two will be formed through the contribution of several private parties in cooperation with the municipality of Rotterdam. The second tranche invests in bigger start-ups and new businesses. The municipality can buy shares of start-ups and the Rabobank is able to provide capital to businesses through 'soft loans'. These are loans without (or hardly any) interest. As soon as the business is successful, the municipality will sell their shares and uses this money to invest in new start-ups.

Best practice:

Technology Transfer Office (TTO) / Rotterdam Science Tower

Since 2003 a Technology Transfer Office (TTO) is operational that actively protects and commercially exploits the IP-based inventions and improvements of this knowledge institute. In this it runs an incubator facility (partially funded by a subsidy of the Municipality of Rotterdam) and starts and supports small enterprises to stimulate the local economy. So far 39 companies have been started up within and/or supported by the incubator facility, generating over 200 jobs (directly and indirectly).

Since January 2008 the TTO has been strengthened through the award of the national SKE-subsidy (Stimuleringsregeling Kennis Exploitatie, granted by the Ministry of Economic Affairs). For this the TTO has committed itself to start up 30 new technology based companies in a four year period. Supporting those companies through this SKE-subsidy it will provide at least 20 loans with a maximum of 100K€ each to companies, after which an additional amount of 125K€ per company can be borrowed from ABN AMRO Bank through a government guaranteed BBMKB-loan arrangement (arrangement to stimulate the provision of credit for small and medium enterprises by SenterNovem, an agency of the Ministry of Economic Affairs). Through this set up the TTO can provide start up companies in the Rotterdam area with management, housing, technology, network and financial support which strongly enhances their success rate and their impact on the economical footprint of the local economy.

At this moment the TTO offers 700 m2 to start-ups in the faculty building of Erasmus MC, combined with shared functions and professional support. The available room at Erasmus MC will be cut in half, however. TTO now committed itself to make available at least 700 m2 of business space (laboratories and office space) in the Rotterdam Science Tower (Europoint 4). This space is meant for the same business start-ups, for companies that have grown further and are likely to (keep) establish(ing) themselves in the Science Tower and for external companies who want to join the developing knowledge. At the floors below in the same building, Zadkine has its seat and, even though it is not a financial partner, Zadkine is explicitly involved with the development. Rotterdam University is a financial partner of the project and possibilities to link (V)MBO, HBO and universities with business are being studied. Students from Zadkine may gain experience at high-tech businesses in the Science Tower. Science Tower's goals are enhancing the chances of start-ups, creating employment, contribute to cluster development within the life sciences cluster in Rotterdam and the characterisation of Rotterdam as important location for life sciences research and business.

3.2.5 Conclusion

Recently, quite some initiatives were developed and more will follow soon. The national government has taken the initiative to develop programmes in which regions can develop

their programmes. At local levels initiatives are taken to share knowledge, cooperate and innovate. However many programmes are not well known or finished properly. The intensions are there but the forward action often lacks commitment. New initiatives are being started, while the old ones have not yet shown their effects. The efforts lack clear goals, are divided over too many initiatives and ambitions are being stacked one after another. The incentive for businesses to organise and innovate is low and it is not a priority for the representatives of the businesses (such as the Chamber of Commerce). This is partly the case because of the lack of awareness among businesses (specially the SME) of the possibilities for cooperation with HEIs.

Best practices are not well known and the exemplary function of initiatives could be explored further. Initiatives often lean too much on certain key persons resulting also in the 'usual suspects' involved in the cooperation. Initiatives are not communicated well to businesses. Creating explicit room for harmonization and coordination and places where people can meet and discuss could stimulate and create familiarity with the different existing initiatives. It will also strengthen relationships between knowledge institutions, businesses and governments, which could lead to new initiatives.

3.3 Interpreting the constraints and effects

Because of the variety in policies and programmes directed at cooperation and stimulation of innovation different constraints and effects can be distinguished.

3.3.1 Government level

At the European level and the national level the importance of knowledge and innovation has been identified in policies and agendas. It has become one of the main priorities to stay competitive in a globalising world. This has resulted in many initiatives described in previous pages. The effect of this focus is evidently visible through the national programmes such as Pieken in de Delta and the spin-offs as a result of it on a regional level. However, because of the fit with European policy, the money (subsidies) involved and the size, reach and consequences of the policy, constraints become visible. Because of all the different aspects that have to be taken into account bureaucracy is unavoidable and a sense of indistinctness arises. There is no tradition at local government level to involve the available expertise at HEIs in developing policy plans, programmes and projects.

3.3.2 Knowledge institutes

The growing awareness of the importance of innovation and cooperation has resulted in supporting a set of policies and programmes. Because of this focus also within the knowledge institutes the awareness of the value of regional cooperation has grown. It is even formulated in strategy documents of the different institutions (such as strategy document Erasmus 2013).

The knowledge institutes have developed action-oriented themes and issues and have planned for implementation. While the institutes are opening to the idea of function as a meeting and networking place, participation and reputation of businesses in knowledge circles, educational programmes and research are rising. More project-based approaches (and flexibility for 'tailor-made' programmes eg. senior lectureships) are being implemented. The national valorisation agenda insists on more structural cooperation between knowledge institutions and the business community and governments. Strategic investments in the relationship are necessary to develop relationships further.

However, there are a number of obstacles that hamper the process of increasing cooperation and valorisation of knowledge into innovative products. As mentioned earlier there exist differences in perspectives on how to approach cooperation. Historically a resistance for (regional) cooperation developed between knowledge institutes but also the institutes and businesses. This is fed by the component of mutual competition: knowledge is power. Another restraint is that national subsidies are scattered and impeding application procedures exists. This makes financing and internal clearing complex. The Ministry of Education, Culture and Science has a limited budget for stimulating practical knowledge development and circulation from UAS, while expectations are high, especially when it comes to strengthening the innovation skills of SME.

A last restraint mentioned here is the fact that a regional orientation often does not fit into the focus on publishing in top-level journals. The incentives to be active within the region, the means, the time and infrastructure are limited. Regional connections are individual with a coincidental character.

Although there are some obstacles that hamper the processes, many activities have been set up where knowledge institutions, governments and businesses cooperate.

Examples of developed activities through cooperation:

- A new pre-incubation centre will be started at campus Woudestein. This incubator will most likely be called YES! Rotterdam and will be exploited together with the incubator in Delft, under the flag of HOPE;
- ESHIP: Erasmus Centre for Entrepreneurship and New Business Venturing.
- EURICUR: research institute focused on international comparative urban issues (founded by, among others, the municipality of Rotterdam and EUR);
- B2SP; a portal for SME ensuring that expertise is accessible by matching questions from entrepreneurs with the right expert (cooperation TUD, LUMC, Erasmus MC, TNO)
- Cooperation TU Delft and Shell;
- Network with large companies and the 'preferred partner' model;
- Projects for start-ups: YES! Delft, Delft centre of entrepreneurship /HOPE, seed fund, business accommodation, programme for fast growing businesses;
- SME: IKD (ICT Circle Delft), SME Portal, knowledge vouchers, education for entrepreneurs, consortium for technological innovations within agriculture;
- Technopolis;
- (Pre-)incubator projects (e.g. Area 010);
- Projects (e.g. Pact op Zuid, Stadshavens);
- Consultation (e.g. EDBR);
- Internships (for both students as well as for teachers).
- SmartPort; new initiative to cooperate in port related research and education in which existing activities will be bundled. Partners: EUR (RSM and ESE), Port Authority and Deltalinqs (port businesses).
- NCSI: Netherlands Centre for Social Innovation; stimulating innovation by paying more attention to social innovation (in framework National Innovation Platform; partners EUR, UvA, TNO and non-profit organisations including trade unions)
- Transumo; partnership of more than 150 organisations (including EUR) combining, developing and implementing knowledge and experience in mobility systems
- Dutch KIC (Knowledge and Innovation Community), strategic partnership between TUD, EUR, WUR, UU, government and business society. Partner within European Institute of Innovation and Technology (EIT), a key driver of sustainable economic growth and competitiveness across Europe through the stimulation of world-leading innovation.

The HEIs have worked on connecting with the region when it comes to innovation and knowledge valorisation. This connection seems to have led to valuable results for the region. However, it is difficult to catch the volatile and intangible knowledge spin-offs in a model (this would be easier with regional relations in terms of education and labour market).

Several studies have been carried out to provide insight in the effects of spin-offs from knowledge institutions to the regional economy. Measurable contributions to the region are mostly related to employment and income. Research and innovation turn out to be not that important when it comes to employment growth; the presence of knowledge workers is more important. The effect for the region is a young, well-educated student population and a large group of graduates looking for their place in the labour market.

3.3.3 Business community

As stated previously, it is difficult for businesses to understand the structure of the knowledge institutions and to enter/start a joint project. Clusters of allied businesses interaction, cooperation and knowledge sharing are vital for competing on an increasingly competitive

market. However, this is rarely done with the help of knowledge institutions (academia) or internship-projects (students). It is an area of focus that could benefit the businesses as well as the knowledge institutions. Academic research is rarely useful for businesses to implement in practice. Through cooperation, brainstorm sessions or other activity academic knowledge should become more likely to be applied in practice. Visa versa, issues of businesses can feed the research of the academia.

The Chamber of Commerce is a coordinating institute specially directed at businesses. This institute tries to create an entrepreneurial environment through, for example, the facilitation of meetings between e businesses and knowledge institutions They also try to pay attention to topics that are interesting for SME entrepreneurs (e.g. Business Location Innovation Award) and send out a collective bulletin on regional cooperation to stimulate innovation.

The lack of a common database with business contacts is hampering the development and transparency of existing relationships with institutes for higher education. This shows that even at the coordinating level of the business community the relationships are not clear and individual relationship between businesses and knowledge institutions are ad hoc and exists on the basis of personal relationships.

In the following box some examples of activities developed by the Chamber of Commerce are shown.

Examples of developed activities through cooperation:

- Cross-connections within cooperation (Project 'Nieuwe Binnenweg') between Chamber of Commerce, Syntens, Hoofdbedrijfschap Detailhandel (organisation for retailers), INHolland en Albeda College;
- Creating labour pools per business location in cooperation with educational institutes;
- Joint communication at a set moment, related to events and meetings concerning innovation.

3.4 Conclusion

It seems that knowledge institutions, businesses and governments do often cooperate, but that this cooperation does not run as smoothly as it could be, and often fragmentised demanding a lot of effort from all parties involved.

Parties involved with this Review feel that there are many positive initiatives in which cooperation between institutions and market arises, but that these initiatives are scattered, could be more effective and efficient, do not have enough scope, do not lead to synergies and do not have lasting effects. Many initiatives are not brought to an end or do not get a follow-up.

There exists a lack of visible valorisation of alpha, gamma and beta research. Insufficient attention for cross-linkages between these knowledge areas exists (i.e. involvement of civil society organisations with knowledge development is very limited) and a limited expression of demand from SME hampers cooperation. Initiatives that are taken are not well communicated to all businesses and businesses appear not very interested in participating. As a result, initiatives depend on the leading role of certain persons.

The parties involved in the Review also get the impression that the government expects lower public budget to go hand in hand with more earning capacity from valorisation by HEIs and universities in particular. According to them, this is not feasible in the short run and only to a

limited extent on the long term. Universities with more experience in this field, like those in the U.S., show that 3 – 4% of total budget is about the maximum one might expect.

Because of differences in vision and policy and a lack of focussed direction many scattered initiatives are developed. This leads to (too) small fragmented (national) subsidies that stimulate innovation through cooperation. You can also reverse the cause and consequences. Because of a fragmented subsidy-policy there is no incentive for a joint focus in direction or incentive to pursue cooperation in order to innovate. The costs and risks are probably higher than the benefits.

Rotterdam is not able to retain their start-ups, because other municipalities are more decisive, offer better financial incentives, and provide better support for the ambitions of young, starting companies for development and growth. Access to supervision, networks, facilities and capital for new established entrepreneurial activities could be organised better. Rotterdam tries to meet the needs of entrepreneurs with the establishment of institutions like TTO.

In the paragraphs above many initiatives have been mentioned that help to create new focus in the valorisation of knowledge and stimulate innovation through cooperation. Although these initiatives seem a bit scattered, there is a clear emphasis on regional innovation and a stronger knowledge (sharing) base of the region. As such many opportunities can be distinguished:

- Rotterdam has a young population, many young companies (e.g. creative industry) and low housing costs;
- Rotterdam has got some clearly strong and high-potential sectors that offer opportunities for innovation and knowledge sharing, especially when it comes to sustainability;
- The crisis is a chance, because it leads students towards entrepreneurship; we can exploit this by offering entrepreneurship as a module within the educational programme in all layers of education;
- Institutions have a lot to offer. However, the region has not made use of this to the full extent. A strong mutual orientation offers a lot of chances to fully exploit this unknown potential. By creating explicit room for harmonization and coordination and facilitating places where people can meet and discuss, the right 'civitas' will be fostered;
- Improvements can still be made to bring the available knowledge under the attention of entrepreneurs.

We can distinguish some threats that might hamper cooperation and the attraction of knowledge in the region. Firstly, when exploiting the potential opportunities, awareness of the dominance of the industrial cluster of the port of Rotterdam is important. This could hamper initiatives. Secondly, the attitude of 'each to their own'' does not stimulate cooperation, but is a recurrent and difficult to break cultural barrier present throughout the Netherlands. Thirdly, keeping students and higher-educated people within the city is an important goal but the image and living environment of Rotterdam are not thought of highly. The program Student City is targeted towards this. Finally, the financial options for subsidies diminish, which could lead to less incentive to cooperate.

We conclude this chapter with some recommendations for further action. The basis for cooperation, the number of initiatives, successful projects and willingness to cooperate is there but there is always room for improvement by knowledge institutions, businesses and governments:

- Knowledge institutes need to focus more on the region, but at the same time the region (i.e. government(s), Chamber of Commerce and businesses) needs to be accessible for this. Both parties need to be willing to work on their relationship.
- Agenda and ambitions should be harmonized and offer focus.
- Government needs to make more effective use of public instruments and should act more as a connector, director and facilitator.
- Sharp focus on action-oriented themes and issues with actual planning and implementation moments, tailor made when it comes to directing participation and reputation of business in knowledge circles, study programmes and research.

- The organising power of business itself should be developed further and should be made use of more often. The Chamber of Commerce and the municipality have an important role to play in this.
- There exists no 'natural' culture of cooperation. But there is also a lack of infrastructure to develop this, in contrast with regions that embraced the triple helix approach.

3.4.1 SWOT-analyses

Strengths	Weaknesses
➢ Increasing cooperation between knowledge institutions, government and businesses; ➢ Number of successful projects in which knowledge valorisation and cooperation have been put into practice (e.g. RDM, SIA, RAAK projects); ➢ Pragmatic and cooperative attitude; ➢ Region with many strong sectors such as trade, petrol-chemics, transport and logistics, financial, legal and architectural services, medicine and the strongly supportive creative cluster; ➢ The region offers sufficient knowledge fields that match the economic structure.	➢ Cooperation between knowledge institutes is up for improvement, which holds for cooperation-links between local government and other stakeholders as well; ➢ Lack of continuity; ➢ Governmental spaghetti with local interests; ➢ Facilitating and supporting spin-offs; ➢ Local governments not active enough in facilitating students (internships, accommodation, thesis assignments); ➢ Low level of education; ➢ Lack of focus on how to cope with a knowledge society from a policy perspective.
Opportunities	**Threats**
➢ A more 'entrepreneurial attitude' towards cooperation between knowledge institutions, (Innovative) businesses and the government t; ➢ Growing awareness of the EUR/ Erasmus MC of the importance of embeddings in the home region (following the principles of the Triple Helix) expressed in the new strategy that has to be implemented the coming years; ➢ Focus on sustainability (economic downturn as a chance); ➢ Science Tower Europort; ➢ Improve the living conditions for students and starters and help them to get in touch with the business community; ➢ Better focus on the relationship between the region and knowledge institutions by developing more initiatives; ➢ Create a more positive image of the city, the focus on the medical and creative clusters together with the harbour can stimulate this; ➢ Use successful projects and the gained experience in the development and continuation of (new) projects.	➢ Setting ambitions that can not be delivered; ➢ No clear incentives for improving cooperation or paying attention to regional problems; ➢ No fine-tuning of agenda's, everybody is too busy; ➢ There is no financial back up for new policy (disappearing funding opportunities); ➢ Lack of direction and control; ➢ Slow respond to new developments (compared to other regions); ➢ Cooperation slows down the decision process; ➢ Dominancy of the port, this strangles other activities directed at the knowledge economy; ➢ Quality of life, highly educated young professionals leave the city.

4 LABOUR MARKET AND TALENT DEVELOPMENT

4.1 Demand for education

Rotterdam is characterised by a diverse economic structure, in which the Port and Industrial Complex has traditionally played an important part. Most jobs can be found in business services, the care sector, retail trade and the transport and industry sectors. The (semi-)public sector, accounting for 35% of jobs, forms a relatively strong basis in the Rotterdam economy. Yet the rise in employment often lags behind growth in the other 3 major cities. One of the reasons thereof is the low level of education of the Rotterdam (working) population, also caused by the trek of many higher educated people after completing their study.

With regard to the economic development of Rotterdam it is important that, in the future, the Rotterdam labour market can compete with other regions. Cooperation between the government, the business sector and knowledge institutions is a must in that respect. The fact that Rotterdam (in contrast with the largest part of the country) has a growing and rejuvenating population is a strong point in that respect.

A strong economy requires an increasingly high level of education and a high participation rate by the population in the labour market. In both aspects, Rotterdam performs poorly compared to the other 3 major cities and the national average. Not only is the level of education of the Rotterdam (working) population relatively low, the people fulfilling the Rotterdam jobs have a lower level of education compared to the other 3 major cities. This applies to the majority of the economic sectors. Moreover, cities with a relatively high percentage of higher-educated individuals, show greater resilience when the economy recovers from a crisis (Atlas voor de gemeenten, 2009).

For the future economic development of the city it is of vital importance that both the participation rate and educational level of the Rotterdam population rise. In addition, a city with attractive employment opportunities able to hold on to its workers becomes an increasingly important factor when labour supply is shrinking.

Research[20] shows that within the three clusters (Port-Industrial Complex, Creative Sector, and Medical and Care) the employment rate is increasing and that a significant part of it is on the level of higher-educated people. Growth is mainly expected in the medical and care cluster. Forty % of the growth is on a higher level. The growth for the labour market as a whole in Rotterdam is expected to be for more than sixty % of higher-educated people, whereas the supply at this level is very low and even decreasing. Future shortages can be felt particularly in the care sector, education and engineering. Shortages of higher educated personnel will also increase. Innovation in e.g. the care sector will become important in order to compensate for the demand for work and to continue to offer high-quality care. The development towards a sustainable economy will also require an increase in innovations.

[20] Werkgelegenheidsmonitor najaar 2007 en voorjaar 2008; Economische Verkenning Rotterdam 2008

The economic policy of the municipalities is aimed at the further development and strengthening of three key sectors: the Port and Industrial Complex, Care and the Creative sector. To this end, implementation programmes have been prepared in conjunction with the business sector and knowledge institutions. In addition to attention to improving the opportunities for new businesses to establish, entrepreneurship and innovation, labour market policy forms an important part of these implementation programmes.

The Medical Delta programme falls within the scope of the Economic development of the Rotterdam Healthcare programme (ER). Medical Delta is an alliance between the knowledge institutions of Delft, Leiden and Rotterdam and the regional business sector in the fields of medial and technical sciences and care. The objective is to establish a medical delta in the western part of the Netherlands. Medical scientists and engineers combine forces to improve the state-of-the-art in health sciences and developments of innovative medical technology.

During the past years, the knowledge institutions (academic hospitals and universities) and companies in Medical Delta shaped their alliance to form a consortium of collaborative researchers, who are often also entrepreneurs. In 2008, the directors of Medical Delta approached the city authorities with the objective to widen the scope of Medical Delta as researchers and entrepreneurs to include education and government.

A total of four workgroups have been set up for the implementation of a joint plan of action for Medical Delta. Rotterdam is the driving force behind Labour Market and Education. This part focuses on the imbalance in the Medical Delta region in terms of the future labour supply in healthcare and the demand thereof. They seek to synchronise these, both quantitatively and qualitatively, by increasing labour productivity through technical and organisational innovation.

The following secondary objectives can be derived from these principal objectives:
Training sufficient care professionals in order to meet the future demand for care.
Creating continuous learning curves, so that the criteria of study programmes are better aligned to the work that graduates have to carry out at care providers and companies.
Reduction in the number of vacancies that cannot be filled.
Keeping staff working in care.

All this makes heavy demands on education. First of all, there is the assignment to deliver higher education with job prospective to as many inhabitants of Rotterdam as possible. The demands made on workers will also change as a result of the innovations. This in turn, makes demands on the cooperation between the business sector, knowledge institutions and the government in order to respond and to prepare future employees and entrepreneurs for the changed requirements set by the economy. According to research of the OBR, the degree of innovation in business of Rotterdam is lower than the degree in many other country parts. There is an interaction: innovative business develops in a surrounding where exchange of knowledge is functioning well and where creative and high-educated people are available. The ambitions of local government concerning economic development asks for a direct and joint effort between local government, corporate life and HEIs in the area of training, knowledge development and knowledge circulation.

4.2 Vision on the labour market and talent development

Each of the higher education institutions in the region has a vision aimed at the development of talent in the region, linked to a vision that is focused on the developing society.

The production of knowledge takes up an increasingly important position in today's society. This production of knowledge further has an increasingly iterative and interactive character, in which new forms of communication, cooperation and co-creation are focal points. Demand for knowledge workers with academic and professional competencies and skills is growing.

The higher education institutions distribute their knowledge by training highly qualified knowledge workers and simulating knowledge applications. Education and research are

interwoven and on equal footing in that respect; both are important pre-conditions for knowledge and knowledge valorisation.

The institutions contribute to high-quality national and international research, interwoven with their education activities. The developed knowledge and academic work methods flow back to society via their students and graduates. As knowledge centres, the institutions are closely knit with professional practice in the region. The institutions are increasingly focused on making a direct contribution to the development of the region as knowledge institutions ('think global, act local').

The relation between the educational institutions and the city will be enhanced along the following lines:

- application of research results in the innovation of products and services of Rotterdam companies and institutions (knowledge transfer) by students and scientists in theme areas such as climate, social cohesion and identity, health, entrepreneurship and logistics and transport.
- stimulation of participation and study success of students from Rotterdam, particularly those of foreign origin, e.g. by active cooperation between universities and schools for higher professional education (UAS);
- increasing the attractiveness of the city and the presence of educational institutions for students, new graduates and staff through an active HR policy, the expansion of student accommodation and establishments in the city.

Rotterdam is not known as *the* student city in the Netherlands. Furthermore, the city fails to properly hold on to its graduates and is often unsuccessful in enticing workers that have been trained in Rotterdam to take up residence within the city. In the years to come, the municipality and the housing corporation Stadswonen will take the lead in making the city attractive for living and young people. Within this framework, Stadswonen, supported by the educational institutions, will aim at the Hoboken-Woudestein knowledge axis concept.

Although many staff of the institutions work in Rotterdam, they live outside the city, sometimes even outside the region. As part of their HR policy, the institutions aim at encouraging their staff to take up residence in Rotterdam. The availability of attractive housing for middle and higher incomes is a condition in that respect.

Rotterdam education is faced with an enormous task. The high drop-out rate (mainly in secondary education) and the on-average low level of education in the city lead to the inevitable conclusion that talent in the city and in education fails to develop sufficiently. This is also clearly reflected in the SEOR report on the economic consequences of talent leaks, showing that the rate of premature school leavers in Rotterdam is nearly twice that of the national average, while progression within senior secondary vocational education (SVE) and from the aforesaid to higher professional education (UAS) and the study success within higher professional education (UAS) are lagging behind. This is bad for the young people concerned; after all, their life perspectives are for an important part decided during their school careers. It is also bad for the city, both from an economic and social point of view. Hence the educational institutions in senior secondary vocational education and HEIs share the ambition to offer every young person in Rotterdam the best possible opportunity to develop their talents in education to their full potential and have declared a commitment to tackling high dropout rates and under-qualification.

The economic crisis currently taking shape adds further urgency to this task. After all, in a situation of limited employment opportunities, there is a universal emphasis on keeping young people in school in order to give them the best possible preparation for an increasingly more demanding labour market. A high dropout rate and under qualification is the last thing the city needs, particularly in these times.

The Rotterdam secondary, vocational and higher education institutions realise that they each have a personal *and* joint responsibility to come to tangible improvements in the Rotterdam educational system. We are convinced that an effective approach must be comprehensive and tenacious. In other words: a coordinated approach throughout the educational column and providing long-term commitment; from detached projects to a structural, programmed approach. This approach must be aimed at concrete, measurable results in the long term, during which progress is systematically monitored.

Initiatives must be geared towards the critical success factors for successful progression. The following are key items in that respect: language and arithmetic/mathematics, the personal equipment of and support for students and the transfer between different types of schools. Examples of instruments and results are:

- tuning of education and testing of language skills between educational sectors, which leads to evident improvement of hose skills;
- introduction of an electronic student file which records the ambitions, talents and development of each student/pupil and leads to improved counselling, improved throughput to suited education and reduction of unqualified drop out.

The efforts must lead to every young person in Rotterdam developing their talents to their full potential during their school career. This at the same time ensures that more young people move on to higher education. Hence the higher education institutions have the responsibility to provide maximum support for this group of students, who are first generation higher education in family or neighbourhood, in order for them to actually graduate in higher education.

4.3 Profile

The institutions continuously gear their study programmes to the needs within the region. On the one hand, this means that the institutions together offer a wide range of study programmes and, on the other, that a number of study programmes are specifically aimed at the needs within the region.

The four higher education institutions are not the only ones providing higher education in the Rotterdam region. They do this together with a number of smaller players. They account for a very large part of the study programmes on offer. Agreements to that end are entered into at administrative level with alliances in places where a joint interest is served. This does not change the fact that the major educational institutions do also compete, particularly where they offer similar study programmes. The administrative consultation is structured through the so-called HOOR (the consultative body for higher education in Rotterdam), where members of the schools discuss developments and share knowledge.
The wide range of study programmes links up with the wide range of professional positions within the region and the demand for study programmes by a broad student audience. The programmes on offer range from specialist academic study programmes, such as aviation and space travel, to more overall professional study programmes, such as primary education teacher-training programmes (PABO). At an academic level, there are focal points in the following fields: medicine and health, economy and business administration, law, culture and society, as well as a large number of technical study programmes.

At higher professional education (UAS) level, study programmes include economy, management, communication, technology, law, pedagogy, social work and fine arts.

Study programmes specifically aimed at the region are primarily focused on the Port and Industrial Complex, medical and paramedical care and the creative industry. Study programmes available within the region are outlined below per cluster.

4.3.1 Port and Industrial Complex

A unique example of a coherent package of study programmes at different levels in the nautical and maritime field is that offered by the STC group. This foundation is situated in Rotterdam and provides education in the fields of e.g. ports, transport, logistics, shipbuilding and marine navigation. The imbedding of the study programmes in the labour market and the business sector is guaranteed by the strong integration of the business sector in the organisational structure of the STC group. The Rotterdam higher education institutions participate in this offer of courses by offering curricula at both higher professional education (UAS) and university levels. In addition, the institutions have various study programmes aimed at different aspects of the Port and Industrial Complex.

Part of Erasmus University Rotterdam is the Centre for Maritime Economics & Logistics (MEL), an interfaculty scheme of the Erasmus School of Economics and the Rotterdam School of Management. Its objectives are postgraduate, executive, in-company, educational programmes in Maritime Economics and Logistics. The centre maintains strong links with the industry. It provides its graduates with work placements and job opportunities and the benefit of being taught by professionals who have excelled in their field of expertise. CEOs of transport & distribution-related companies and representatives from the city and port authority participate in MEL's Advisory Board.
The School of Economics offers a specialisation in Urban, Port & Transport Economics within the Master Economics and Business. This specialization is designed for students who wish to acquire a deeper understanding of the economics of cities, regions, ports and transport and therefore aims to increase students' insight on this subject. The programme adopts an integrative approach in which the linkages between urban, port and transport economics are central. It builds upon a longstanding tradition and broad international research experience of the staff involved.

The Faculty of Law of EUR offers a post-graduate Master's in Business, Corporate and Maritime Law. This programme offers three specialisations focusing on current developments in the three core areas of business, corporate and maritime law. Characteristics of this course are excellent skills training (such as contract drafting), interdisciplinary approach, a strong link between theory and practice and very good job perspectives. The Erasmus Postgraduate LL.M. in Business Corporate and Maritime Law is designed to provide candidates with the theoretical and practical knowledge to understand the global environment of international commercial practice. By focusing on current developments in the three core areas of business, corporate and maritime law, the programme gives lawyers the practical skills necessary to deal with business problems and disputes, whether in an international or national context.

Delft University of Technology offers two Bachelor's degree programmes, the Maritime Engineering and Civil Engineering programmes, which are (for an important part) aimed at the Port and Industrial Complex. The same applies to the Life Science & Technology Bachelor's degree programme, albeit to a lesser extent. A number of Master's degree programmes of the Delft University of Technology are also aimed at the Port and Industrial Complex. This mainly applies to the Civil Engineering, Coastal and Marine Engineering and Management, Offshore Engineering, and Marine Technology programmes.

A large number of courses of Rotterdam University are affiliated to the regional Port and Industrial Complex. They include the Bachelor's degree programmes Logistics and Economy, Logistics and Technical Transport Science and Maritime Officer (the latter is organised in conjunction with the STC group) and the Logistics Management Master's degree programme.

The field of expertise of the Bachelor's degree programmes Civil Engineering, Chemical Technology, International Business and Business Economics is directly linked to the complex of transport, trade, industry and business services that are connected with the port. A new study programme specifically developed for the Rotterdam region is the Bachelor's degree programme Water Management, which prepares students for an integral approach of all issues that relate to the use and management of water. Students from many study programmes of the university can participate in the Minor programmes (30 ECTSs) Water Management and Hydraulics, Infrastructure and Mobility, Maritime Management, Supply Chain Management, as well as more than ten different minors in the fields of international trade and management within an international environment. The Port and Industrial Complex also forms an important focus within the research programme of the university. The Logistics and Ideal Port senior lectureships are striking examples. The latter is a collaborative project between Rotterdam University and the Municipal Port Authority.

INHolland University maintains various formal and informal relations with the Port and Industrial Complex in the fields of work placements, graduation and research. For instance, the Digital World lecturer advises the Port Authority with visions on the Maasvlakte. Research into the implementation of knowledge systems and portal technology has been carried out as part of dissertation work placements, for instance. The boards and governance senior lectureship has conducted research into port governance, studying the process of implementing management, supervision and codes in companies in and around the port in concrete terms. In addition, INHolland participated in events specifically geared towards the port.

In January 2009, fifty third and fourth-year higher professional education (UAS) students at Rotterdam University (including the STC Maritime Officer programme) and INHolland University were introduced to CEOs of companies in the port of Rotterdam. This was organised as part of the Deltalinqs Annual Dinner event. Students were linked up with companies in the port and the industrial area. This initial introduction will be followed up by a number of business visits, during which students are given an extensive inside look into companies and organisations in the port area. The students will write essays about these visits and will be bundled into a booklet to be presented during the World Port Days. In the past, events such as the Young Port Debate were organised by the Economic Development Board Rotterdam (EDBR) and the Academic Centre Transport (ACTP) before, specifically for education and the port. The first debates were organised by Rotterdam University and the Port of Rotterdam. Students of higher professional education (UAS) and at the universities in Rotterdam and Delft use this to develop innovative ideas for the Port and Industrial Complex.

4.3.2 Medical and paramedical care

Within the Erasmus MC, the Erasmus University Rotterdam organises the Medicine study programmes, consisting of the Bachelor's and Master's degree programmes medicine, medical advanced programmes such as the 30 specialists programmes and the five Research Masters. In addition, EUR organises the Bachelor degree programme in Health Sciences and the Master degree programme in Care Management and Health Services Research. This latter Master programme is offered under the auspices of the Netherlands Institute of Health Sciences. Finally, Erasmus MC provides a number of specialist senior secondary vocational education (SVE) and higher professional education (UAS) programmes for nurses, such as nursing programmes within psychiatry.

Delft University of Technology offers a number of Master degree programmes related to medical care, such as the Biomedical Engineering and Life Science & Technology Master programmes. In addition, orientation towards the medical discipline is optional within the different Master degree programmes of the Faculty of Industrial Design.

Rotterdam University organises the Bachelor degree programmes in Nursing, Physiotherapy, Occupational Therapy, Speech therapy, Obstetrics, Healthcare Technology, Management in Care and the Master degree programmes in Advanced Nursing Practice, Physician Assistant and Manual Therapy. The Social Work and Service Provision and Social Pedagogic Assistance programmes produce many professionals in the care sector. The Minors Integrated First Line Care, Coherence in Parental Care, Prevention and Health Promotion and Growing up Healthily discuss the specific issues of care in the Rotterdam region. The development of healthcare takes up a prominent position in the research programme of Rotterdam University. The senior lectureships Transition in Care, Integral Parental Care (financed by the Laurens care institution), First Line Health Care and Labour, Participation and Health each discuss the specific aspects of (health) care in the urban setting of Rotterdam. Various points in this research feature close cooperation with the EUR Medical Faculty. Logistics is an important issue in health care and so in health care education and research (EUR and Rotterdam University).

4.3.3 Creative industry

On 1 September 2009, the Erasmus University Rotterdam will start a new study programme in Communication and Media. This course has a strong affiliation with Rotterdam and various locally active companies and organisations such as Unilever, Consomnant Communication Group, TNO, the Municipality of Rotterdam and Rotterdam University participate in the professional field committee. In addition, EUR organises a number of other study programmes in relation to the creative industry, such as the Bachelor's degree programme General Cultural Studies and the Master's degree programme Art and Cultural Studies and Media and Journalism.

The design courses of the Delft University of Technology fulfil a specific social need and contribute to the active projection of technology. The study programmes are small-scale and feature strong links with the business sector. Examples of these study programmes include the Bachelor's degree programmes Building and Architecture and Industrial Design and the Master's degree programmes Architecture, Urbanism and Building Sciences, Design for Interaction, Strategic Product Design and Integrated Product Design. Together with the two other Universities of Technology, the Delft University of Technology aims to enhance the offer of designer courses by organising one fully-fledged national offer of PhD programmes in this field, under the flag of the Stan Ackermans Institute.

The Bachelor degree programmes in Graphic Media Technology and Communication and Multimedia Design have been developed by Rotterdam University in close consultation with SME in the field of media. The Municipality appointed Lloydspier and Coolhaveneiland as centre for the development of those activities, which form part of the promising Creative Industry cluster. Hence Rotterdam University also accommodated its media courses in premises within that city district, which is fully geared to education surrounding media, from a creative, technical and economic perspective. This is also the scene for research by the Human Centered ICT senior lectureship, e.g. in the Minors Designing Sensitive Environments, Concept and Product Development and User Experience Design.

Another centre for creative activity is the grounds of former shipyard RDM, now developed into the RDM campus for Research, Design and Manufacturing. This is where education and research in the field of innovative product development is concentrated: the Bachelor's degree programme Product Development and the Master's degree programme Product Design, which will be linked up with the Innovative Product Development senior lectureship. The RDM campus offers companies on the basis of a knowledge contract with Rotterdam University the opportunity to hire business space in the former factory unit, which is now also used for practical training of the courses concerned. The study programmes Building and Architecture, Mechanical Engineering, Electrical Engineering and Car Engineering also play a role. The

Master degree programmes in the field of Architecture, Urban Design and Urban Development find their home base within the RDM grounds. Students from many study programmes can opt to participate in the Minors Smart Energy and Products, Design Office, Design and Engineering. A third centre is the Willem de Kooning Academy for Art, Design and Leisure. The Bachelor's and Master's degree programmes strongly focus on applied art and designs. In the Cultural Diversity senior lectureship and the Minor affiliated to it, specific research is carried out as to how the design and art practice develops in the multicultural Rotterdam surroundings. Minors such as Art and the City, Media Design and Products and Concepts link the academy directly to the development of creative activity in the region.

INHolland offers a number of programmes in the field of Communication, Media and Language, including the (Bachelor's) degree programmes Communication, Media Entertainment Management and Cross Medial Communication. In addition, the Digital World senior lectureship is working on Serious Gaming, with the design thereof forming part of the Minor. In 2007, the School of Communication and Media organised the Film Factory 2007, with a Master Class by Rutger Hauer in conjunction with the Rotterdam Fund for the Film and AV Media and the Rotterdam Development Company. Various national and international celebrities contributed to this.

4.3.4 Education and upbringing

The above-mentioned assignments for education in Rotterdam, also ask considerable effort for the training of new teachers. The growth of the youth population in Rotterdam, withdrawal of a lot of teachers through retirement the upcoming years and a relatively low interest in the profession of teaching, cause significant bottlenecks for primary and secondary education.

Rotterdam University offers an extensive package for teacher-training courses in primary, secondary and vocational education. INHolland University offers teacher-training courses for primary schools. Both teacher-training courses for primary schools got their accreditation with high grades. The primary school teacher-training courses produce teachers that are well-prepared for a role in education in the city, which is characterised by an enormous diversity. In addition, Rotterdam University offers 22 different Bachelor's degree programmes leading to a grade two qualification for secondary and vocational education. A number of those are specifically geared to vocational education, such as the teacher-training course for Healthcare and Wellbeing and the courses for a series of technical subjects, such as Building and Architecture or Motor Vehicle Engineering. The university also offers a Pedagogy Bachelor's degree programme, specifically aimed at support in the upbringing. The Social Pedagogic Assistance course trains many professionals for future roles within childcare and preschool education. At a Master level, Rotterdam University offers the Pedagogy and Learning and Innovating programmes. The first focuses on Urban Education and offers professionals of various backgrounds the opportunity to a more in-depth study and research into issues surrounding the upbringing within an urban and diverse environment. The second focuses on professionals with a specific responsibility in the fields of development of education and organisation within the school organisation. That course too is specifically aimed at the issues that are characteristic of education within an urban context.

Delft University of Technology wishes to continue to offer students a teacher-training course in the future. There is a shortage of science teachers, while the "engineer in front of the class" has an important exemplary role. Furthermore, structural cooperation with secondary education in the region is required. The Delft University of Technology, in conjunction with other universities of technology, converts the teacher-training courses into a single Master's programme of Science Education and Communication. In addition, cooperation with higher

professional education (UAS) is intensified when training grade two teachers for science subjects. In the region they work together with Rotterdam University.
Erasmus University Rotterdam develops a package of study programmes aimed at the fields of Pedagogy and Didactics. Plans to set up grade one and two teacher-training courses in different disciplines are included.

Education and Upbringing contribute to the labour market

Education contributes to the development of the labour market in the social field. Universities, for instance, work together with educational and social institutions in projects such as 'community schools' and the 'pot met goud op zuid' foundation. The community schools knowledge centre and the Het Jonge Noorden op Zuid project agency of INHolland University coordinate knowledge, implementation and supply and demand therein. Teaching programmes such as: school and family, support in upbringing and society and family form part of the curriculum and, in addition to theory, also form a practical part in these projects. At community school 'Wereld op Zuid', Rotterdam University has developed the social team, which team promotes the development opportunities of students and the involvement of parents.

An alliance between senior secondary vocational education (SVE) and higher professional education (UAS) aims to intensify tackling youngster with problems. This alliance was formed between Rotterdam University, INHolland University and the Zadkine and Albeda Colleges under the name of Ideal Youth Work. At the end of 2007, the municipality developed a plan which is to produce 50 FTE new youth workers. To this end, a training programme was started, in which the participants are trained for 18 months (60 weeks) and rotate between the schools (SVE and UAS) every 10 weeks.

In the Cross Over project, isolated women from deprived areas are guided to the labour market and society via an intensive personal approach. Since the women and mothers are made aware of their options, they in their turn relay that information to their children. Six students from INHolland University organised the project. They link up female course participants of ROC Zadkine to fourth-year UAS INHolland students and Dona Daria role models. The manner in which parents bring up boys and girls can either lead to social inequality or, on the other hand, promote equal opportunities. Hence Rotterdam wishes to stimulate an upbringing that breaks through pre-defined roles.

4.4 Student recruitment and counselling

The majority of Bachelor's students in Rotterdam institutions are from Rotterdam and surroundings. This varies between the HEIs and the courses they have. The UAS have a strong regional bond, while both universities recruit their students out of a much broader region. Some courses within UAS (like the teacher-training courses of Rotterdam University) also recruit in a wide region, due to the fact that these courses aren't wide spread. The local youth population features a number of characteristics that significantly differ from the national average and even from that in other major cities. The most noticeable aspect is the low average educational level of the population, which is also related to the highly ethnic-cultural diversity. Research[21] into the effects thereof carried out by SEOR on the instruction of EDBR clearly shows that this heavily impedes the economic and social development of the region. Hence education in the city is faced with the task to seal talent leaks, to minimise unqualified dropout levels in the educational system and to stimulate and support each young person to develop his talents in education to their full potential. Analyses from demographic developments further show that in the Rotterdam region, contrary to the majority of the Netherlands, rejuvenation is increasing. This will have an effect on the scope of the influx. Given the increase in student numbers, it is important to manage on the basis of the qualities of future students. In addition, the announced changes in secondary education (flexibilisation) and the relatively low interest in technical study programmes, further feed the need for investing in the alignment of secondary education to higher education. It is in the interest of both students and institutions of higher education to maximise efforts, so that each student ends up in the right place in higher education. The educational institutions work together intensively in this field, both among them and with institutions for secondary education and senior secondary vocational education (SVE), in order to ensure maximum student progression. A concrete example of this cooperation is the Deltaplan Rotterdam Education, in which the Boards of Zadkine, LMC, Rotterdam University, INHolland University, Erasmus

[21] Final report: "Alternative investment in education: economic effects of talent leaks in the Rotterdam region", October 2008

University, CVO, BOOR and Albeda participate. Agreements on cooperation on themes such as language and arithmetic, the personal equipment of and support for students and the transfer between different types of schools have been laid down in this plan. Another example includes the completed RAAT (regional arrangement of aligned programmes) project subsidised by the Municipality of Rotterdam. This project is an example of intensive cooperation between the Rotterdam higher professional education (UAS) institutions and senior secondary vocational education (SVE), aimed at qualitative and quantitative improvement of student throughput in vocational education. In addition, each of the four institutions maintains contacts with secondary schools at different levels.

The influx policy of the institutions is aimed at study successes of the future students. The policy is characterised by the intention to give future students a good idea of the school and the quality thereof within the location of Rotterdam and of the different study programmes on offer, in a professional manner and with the assistance of those who are directly involved, teachers and other staff. Instruments used to achieve this include public relations and media, providing both a recruiting and substantiated profile of education. Specific attention is paid to the city of Rotterdam, which will be the students' base, the subject matter and the local opportunities on the labour market. It is clear that, within that framework, the institutions seek a competing and distinguishing profile compared to each other. The study programmes are partly complementary and partly overlapping. No quota agreements are made between the educational institutions.

Traditionally, the institutions have a lot of international students. For instance, more than 2400 international students study at the Erasmus University, representing more than 100 nationalities. As such, the student population is a true melting pot of cultures. The majority of the Master degree programmes of the two universities are in English. In addition, the institutions offer a number of Bachelor degree programmes in English. The institutions also attract students from outside the region or the city of Rotterdam. No structural policy has been chosen as departure point for this influx. The courses on offer partly determine the enthusiasm of students to come to Rotterdam to study. Together with the municipality, Rotterdam institutions connect to the Student City theme. The objective is to highlight and improve the attractiveness of Rotterdam as a student city and as a city to live and work.

An important part of the influx for both universities (more than 30%) comes from senior secondary vocational education (SVE). This progression in the vocational column is of significant importance to our region, as compared to the situation in other cities, a relatively large part of young people takes a training course via senior secondary vocational education (SVE). This particularly applies to students of foreign backgrounds and for students from families that do not traditionally study in higher education. On the one hand, in terms of specific vocational knowledge, students from SVE enter UAS with a head start compared to students from higher general secondary education and, on the other, in terms of general knowledge (such as language) and working with abstract concepts and study skills, often also with an additional need for support. Hence the ROCs (intuitions for SVEs) and universities have been working closely together for years to organise aligned programmes (regional arrangement of aligned programmes – RAAT), which ensure the best possible progress to higher education, both quantitative and qualitative. This has lead to an assignable improvement of throughput. A new opportunity of cooperation is the arrangement of short UAS (associate degree, level 5 in the European qualification system) aimed at a new perspective in higher education for students moving on from SVE.

4.4.1 Recruitment instruments

- Scholarship Rotterdam

The local government and the three HEIs in Rotterdam (not including TU Delft) offer an extra orientation to choose a course, starting November 2009. For the first time they offer in

cooperation, the opportunity to get specifically informed on the possibilities of higher education in Rotterdam to students in secondary and vocational education.

- Trial study days

In order to give prospective students a good idea of the study, they are given the opportunity to have a taster of studying in the institutions during shadow days or as part of trial study programmes. Existing activities in the field of alignment with particularly the Student Lab[22] and the Better Science project (an alliance between five local pre-university schools) are set to be extended considerably in the years to come.

- Junior Delft University of Technology

The Delft University of Technology traditionally draws in many pre-university students with an affinity and high scores for science and technical subjects. The Delft University of Technology started the Junior Delft University of Technology in 2007 specifically to attract talented and motivated fifth and sixth year pre-university students nominated by their teachers. They work on a project one day a week, for a period of five weeks. The students are taught theory, do experiments and are given an open assignment to work on under guidance of lecturers and students of the Delft University of Technology.

- Parents' days

Since a few years, parents of potential students and those of first-year students are intensively involved in our school, as the institutions regard them as the stakeholders and are often decisive in the choice of study for their son or daughter. Special evenings are organised during which they are introduced to and given examples of education they can participate in.

- Ambassadors

Students from different institutions are peer coaches and/or ambassadors. Within that capacity, they guide talented students from secondary education and stimulate and support them when making the step to higher education. Efforts by particularly the higher professional education (UAS) institutions are aimed at providing support for students who are the first in their family or environment to take the step to higher education. The setup can involve the appointment of more than one hundred students of the university as peer coaches in order to guide those students in secondary and senior secondary vocational education (SVE) who show sufficient talent for a higher education programme, but who require support in order to actually make that step. Peer coaches are mainly the successful students from the underrepresented groups. They can either fulfil the role as mentor/role model, but can also provide concrete support as a tutor in specific subjects.

- Initiation and introductory interviews

Both universities have a system of initiation interviews with future students; experiments with this are in place in the universities for a number of study programmes. Each student that enrols for a study with one of the universities is invited for an initiation interview with a student career coach immediately after enrolment (thus preferably before the summer). This is partly conducted on the basis of the results of a digital start monitor, in which the status of basic competencies (language, mathematics) of the student is verified, yet background, motivation and study selection procedure are also discussed. This interview leads to a 'potency profile', which is used to manage the individual guidance of the student from the start of the study. If there is reason to do so, the student can be invited to take part in a summer course prior to the start of the academic year, aimed at providing him or her with additional preparation and confidence before starting the study.

4.4.2 Support and counselling of students

An important challenge higher education institutions are faced with is improving the study return. Currently, of the total student influx entering the Rotterdam institutions in any one year, over 55% obtains a Bachelor's degree within 5 years. After 8 years this percentage has risen to over 66%. Those figures are slightly below the percentage of the national average

[22] www.scholierenlab.nl

(58% and 68% respectively). The unqualified dropout rate is substantial (21% after 3 years). Further analysis of the figures shows that many students ultimately graduate in a different study programme than the one they initially started. Students thus frequently change direction, often within the original hei though. It further appears that the study success of non-western foreign students is significantly lower (43% and 56% respectively) and the dropout proportionately higher. Thus the increase in diversity in the student population poses a substantial problem to the Rotterdam institutions. As from 2008, the Ministry of Education, Culture and Science (OCW) gives the major universities in the Randstad conurbation (which includes the Rotterdam institutions) in order to improve the student return of non-western foreign students. A number of the interventions described below are funded by such means. Important objectives are to ensure that every youngster is matched to the most suitable higher education programme and to prevent unnecessary dropout. Intensive personal guidance is of major importance in both cases.

- Peer coaches

Efforts by the higher professional education (UAS) institutions are aimed at providing adequate support for students who are the first in their family or environment to take the step to higher education. The setup can involve the appointment of more than one hundred students of the university as peer coaches in order to guide those students in secondary and senior secondary vocational education (SVE) who show sufficient talent for a higher education programme, but who require support in order to actually make that step. Peer coaches are mainly the successful students from the underrepresented groups. They can either fulfil the role as mentor/role model, but can also provide concrete support as a tutor in specific subjects.

- Student counselling and progress interviews

During the study too, there are numerous provisions in place for providing additional support to students who need it. This includes additional support education surrounding basic subjects and the availability of (student) counsellors. In order to stimulate students to take up a study suitable for them as soon as possible, three of the four institutions apply a binding study advice at the end of the first academic year. In their first year, students must have achieved a minimum number of credits, e.g. 40 ECTSs. If they achieved fewer ECTSs, they cannot continue the programme. In February of the first academic year, students receive a preliminary, binding study advice. Individual student interviews are planned for students who have been given a preliminary, negative study advice.

In addition, Rotterdam University applies a student career coaching system, in which each student has a minimum of three and a maximum of ten individual interviews per year with a certified coach, whose central task is to assist the student in developing his talents to their full potential.

4.5 Education setup

The organisation of education in the educational institutions links up with the region in various ways. These methods all contribute to the student obtaining the competencies that are important to the region *and* that he too develops a link-up with the companies and institutions that need him as an employee after the study. This paragraph describes a number of these methods.

The educational institutions use the demand of local companies and institutions for knowledge, vocational development and innovative products as a departure point for an important part of education. By meeting those demands, the students learn an important part

of the intended professional competencies. The results of their work are returned to the companies involved.

4.5.1 Practice-driven education

An important part of the entire curriculum of the higher professional education (UAS) institutions is reserved for practice-driven education, in which such demands from external partners serve as subject for the learning process of the student.

> Rotterdam University made the connection between education and knowledge questions of companies and organisations in the region to an essential point in their educational policy. The motto they use therefore is 'outside in – inside out'. The courses of the institution use a professional network of accountmanagers to stay in touch with companies and organisations. The questions and assignments out of these contacts are brought in in the education. This leads to specific products that companies and organisations can use.
> In the first study phase, this is often reflected in the form of projects in which groups of students from one or more study programmes tackle a practical issue. In a number of study programmes, this takes place in the form of a work experience company, a centre that has been set up as a consultancy agency where practical issues from the business sector are tackled by groups of students. In subsequent study phases a work placement (20 EC) and dissertation research (20 EC) form important parts in which the student works for a company or institution, mostly locally. The dissertation research must lead to a relevantly new product for the relevant company, as a result of which the student also demonstrates to possess the professional competencies that correspond to the study programme.
>
> Rotterdam university associates with this also the research programmes of its senior lectureships. The results of the assignments are translated into new practical knowledge, which contributes to the further development of the practice. The senior lectureships of Rotterdam University are directly connected to the economic and social issues in Rotterdam.

Work placement and graduation make an important contribution to students in professional education mastering the intended competencies in a concrete working environment and contributes to the bond between student and company. In many cases, a work placement leads to an employment contract being offered.

The organisation of dual learning pathways in a number of the study programmes of universities also needs to be mentioned. This concerns a tripartite agreement between student, university and the company where the student works. An important part of the study programme is shaped and substantiated in the work that the student carries out in the company. The universities have agreements with local organisations and companies, e.g. with (care) hospitals, schools, accountancy firms, tourist information offices, the Court District and the municipal department of Social Affairs and Employment in order to organise such study programmes. An example is the cooperation agreement of the Rotterdam School of Law of INHolland University with the Rotterdam Court District. This cooperation includes agreements on research, teacher and student work placements and the joint organisation of knowledge congresses. In 2008, for instance, the Law and Language congress was organised by both parties in which language was focal point.

4.5.2 Work placements

As stressed previously, practice-driven education is an important and obliged part of all courses in UAS. In addition students manifest themselves also as knowledge carriers, among other things, by somehow working as volunteers, whether or not as part of the curriculum. From the perspective of the institutions, community service is particularly valuable when students gain knowledge and skills, practice or develop further, which are relevant to their study and further career. The social added value is a focal point for the city, while community service makes a natural contribution to stimulating social cohesion.

Service learning at the Rotterdam School of Management, Erasmus University started in 2003/2004 when an experiment on service learning was funded by ECHO, the Dutch centre for diversity policy. Participants in the first experiment were, next to faculty and staff, some 10 local grass root organisations. The first experiment was part of a research project to investigate the possibilities of combining learning and community involvement in a different non-profit regime. Most examples of service learning can be found in communities where the government is not very active in funding universities and local non-profits, leading to a kind natural partnership between universities and local communities. In the Dutch context the government is very active in both funding universities as non-profit organisations, so some institutional resistance was expected. The research proved that also in a context where ties between university and local community are less common and maybe less needed from the funding perspective; mutually opening up both worlds is welcomed by staff, students and most of all the community. Service learning aims at combining academic learning on a certain topic and consultancy with service. Several rounds of service learning have focused on diversity management (supporting small local grassroots in opening up), business community involvement (researching and creating partnerships between businesses and local non-profit organisations) and business management for the creative industry (consulting (non-profit) entrepreneurs and the local community on developing new creative initiatives). Service learning offers students the possibility of combining experiential learning with service to the community. For many students it creates a welcome hands-on experience in an environment where they really can make a difference. For the community organisations it opens a new tool for recruiting knowledge, specialist support. For the university it adds to the community profile and brings in unexpected visitors.

INHolland University opts for student career guidance as a part of the curriculum in order to make the student responsible for the personal learning process and to ensure that the full four years are offered as an integrated part of the curriculum. The student is counselled when making choices, also in respect to career choices. They are shortly connected to the field of practice and define (with supervision) questions and learning objectives in this area. In connection with the main curriculum a relationship often develops on short notice with the direct external environment including in Rotterdam. This at the same time produces at course and institutional level a strong interaction with the field of work in the city and the teacher section, creating structural relations with that environment, where possible.

A striking example of a direct connection between the economic focal points of the city and education is the approach in which Rotterdam University, the Port Authority and companies in the port (Deltalinqs) systematically include port issues in various study programmes, in order to make working in the port a challenging perspective for students. A central role therein is played by the Ideal Port senior lectureship. The lecturer also has a management role in the Port Authority and the costs of the senior lectureship are shared between the university and the Port Authority.
"A world-class port needs professional, highly educated personnel. Allow today's students to shape the port they want to work in later. Let them think of innovative solutions for issues that play in the port. This is how Rotterdam will create the smartest port in the world." That is the mission of the senior lectureship that wants to stimulate innovative thinking among students and lecturers in order to shape the port of the future. This requires a match between the Port and Industrial Complex and the study programmes of the university. Port companies have a lot of know-how and practical experience in the fields of logistics and technology, IT, economic and commercial issues, civil engineering, building and architecture, spatial planning and HRM. Yet the companies also need innovative ideas, in which students and lecturers can play a role.
The senior lectureship creates the match by enthusing university students for the port by means of guest lectures, optional subjects and excursions leading to projects and work placements. This approach has resulted in hundreds of students from many different study programmes having completed assignments and projects in the port. This generates attractive results for the companies involved, while the students are given an insight into the challenging possibilities there are for more highly-educated staff in the port. Following on from that, a trainee project has been organised in which newly graduates are given the opportunity to work in port companies, with a view to the enhancing the presence of more highly-educated staff and knowledge positions within the port.

4.5.3 Minors

Matching education to the specific needs in the region is for an important part decided by the contents of the Minors. Each Bachelor's degree programme includes a Minor, which can be selected by the student from an extensive range. The programmes the student can choose from consists of a wide range of more in-depth and/or widening differentiation Minors. The universities also offer to choose a Minor that prepares for an accelerated progression to a university Master's degree.

Both at Rotterdam University and the INHolland University, the Minor fulfils a specific role in the final stages of the programme, different to that of the Major. Focal point is not the professional competence itself, but the application in current and challenging issues. An important element decisive to the value of Minors is the topical, explorative and innovative character. They discuss current issues in professional practice, in a certain profession or at the interface between professions. Minors must be aligned to professional practice; hence the impulses for renewing the programmes on offer are based on the developments in the professional practice. They must also be aligned to the fields of expertise of the senior lectureship. After all, the innovative strength of the university is bundled around it. Hence the range of Minors is tested in that light on an annual basis. Minors offer the opportunity to organise education in which students from different study programmes work together in tackling current issues that requires such a multidisciplinary approach.

> The Integral Safety course is a textbook example of alignment with the local environment, as the curriculum and the corresponding project activities are perfectly aligned to the specific Rotterdam approach in the field of integral safety. Other striking examples are the Social Pedagogic Assistance and Social Work and Service Provision programmes. They are both courses that, historically, have always pursued strong contacts with the urban professional field and set up projects in conjunction therewith. The Social Legal Services study programme, part of the School of Law of INHolland University of Applied Sciences offers a specialisation Minor Debt Assistance in which students and lecturers work closely together with the municipal money-lending and debt counselling institution and the Ministry of Social Affairs and Employment.

One of the quality requirements of the Minors at Rotterdam University is that the subject matter is aligned to the current themes important to the region. By the end of 2009, for instance, a total of 13 Innovation Labs will have been set up, in which students from various study programmes develop a joint integral solution in their Minor for a concrete issue, introduced by an external, local partner. Two concrete examples of such an Innovation Lab are listed below.

> Rotterdam University has been asked by care provider Laurens, housing association Woonbron and the sub-municipality how to enable senior citizens in the Rotterdam district of Penrecht to live independently for longer. The senior lectureships involved are Innovation and Product Realisation, Human Centred ICT, First Line Care, Transitions in Care. In the Innovation Lab, it is about realising an improved physical infrastructure (housing, provisions, broadband ICT) and an improved care infrastructure (coordination between first and second line care; use of smart ICT applications), geared to the needs of the residents. Students from courses relating to building, ICT, product development and healthcare as well as from economic courses can contribute to the solution.

> With the framework of Pact of Zuid, the large-scale municipal programme to stimulate the development of Rotterdam South, work is carried out on the development of community schools with an innovative character. The school will be the centre of integration and participation with the district. The intended activities include organising civic integration and language courses and literacy training at the school, in addition to activities that must also contribute to intensive parent participation. The sub-municipality, the school boards and the housing association (property development and management) involved are the commissioning party for an Innovation Lab in which some schools are integrally "adopted" for their development through work by senior lectureships (Growing up in the City, Social Property) and the students involved (teacher-training courses, social courses, building and architecture, property and estate agency, fine arts).

4.5.4 Entrepreneurship

A strong economy is highly dynamic. Entrepreneurs start new businesses, existing companies grow and new markets are opened up. The municipality stimulates entrepreneurship by contributing to incubators through the knowledge institutions, such as the medical incubator and (in the past) AREA 010, but also by setting up the Medical Seed Fund and the Climate and Innovation Fund, together with others, for financial participations in particularly innovative start-ups.

Stimulating economic activity and innovation, in cooperation with the knowledge institution in the city, is an important motive for the municipality. An example is the Rotterdam Climate Initiative, which is aimed at reducing CO_2 emissions by half, yet to strengthen activities in the sustainable economy.

Hence the theme of Entrepreneurship is an important element in the relation between education and the labour market. Each of the four higher education institutions offers students the possibility to be introduced to entrepreneurship through a Minor. Within the universities, the Holland Programme on Entrepreneurship (HOPE) supports these curricula. The institutions work closely with various incubators for starting entrepreneurs, for instance Area 010 (aimed at business services), New Trade lab/entrepreneur house and the Creative Factory (aimed at media and design). On the one hand, those organisations offer accommodation to former students starting a company and, on the other, young companies formed outside the university are supported with the knowledge they need.

One of the core values of INHolland University is stimulating entrepreneurship. This means that, in addition to the student himself being encouraged to start a business – particularly the economy, management and communication student – pro-activity, adaptability and creativeness in the competencies that have been defined is also pursued. These competencies are monitored and tested within the different education units, but also discussed and assessed during the student career guidance. Companies can address their questions to the Service Centrum Ondernemen. Students, but also senior lectureships will work on these questions.

Rotterdam University also offers specific support to students who wish to start as entrepreneurs after having completed their studies. Any student who wishes to do so can opt for a Minor in the field of entrepreneurship organised by the university institution aimed at entrepreneurship. This Minor leads to a nationally recognised certificate for entrepreneurship.

The same applies to the Erasmus University Rotterdam. Students are given the option to do a Minor on entrepreneurship. A number of students does this Minor based on a professional interest, yet at least half the students does the Minor as they have an interest in starting a company themselves.

Delft University of Technology aims to enable each student to familiarise himself with entrepreneurship during his study. To this end, the university stimulates entrepreneurial subjects in the curriculum. Involvement of successful entrepreneurs in awareness activities creates role models. Extracurricular activities are organised in the field of entrepreneurship in close cooperation with study and student associations. A joint Master track is started with the 3TU Innovation Lab and a joint entrepreneurship course is worked on by Ph D students and staff.

Each year, the Delft University of Technology delivers around 50 start-ups. They include young design agencies, small ICT companies, architectural firms, companies in the field of technological service provision and techno-starters: entrepreneurs who introduce a new technological product into the market. Some of these start-ups are supported by YES!Delft. YES!Delft was formed in cooperation with the Municipality of Delft and the Ministry of

Economic Affairs. This organisation stimulates and supports these techno-starters with services such as office space and legal support and support in the form of coaching by experienced entrepreneurs and offering a relevant network. The Delft University of Technology and YES!Delft, in conjunction with the Enviu Foundation in Rotterdam, have taken the initiative to set up a sustainable incubator in the Port of Rotterdam. As from September 2009, within the former RDM grounds, starters who focus on sustainable energy, mobility and a sustainable lifestyle will be supported.

The RDM grounds in Rotterdam (see chapter 3 also) where the lab must be set up are set to be the icon of the city of Rotterdam in the field of sustainability. The lab scouts for sustainable business ideas and innovations that show potential for internal scale-up. RTM Innovation Lab offers scouted (potential) entrepreneurs a platform to convert their idea or invention into a scalable and successful company. The young pioneers are given access to business development support, networking in the field of creativity, theme knowledge, financing and potential clients. In addition, the lab offers inspiring workplaces, space for building and testing prototypes, showrooms and facilities for meeting the network. Established companies too can come to the RTM Innovation Lab for testing their innovations or obtaining support in the marketing.

The RTM Innovation Lab must attract people at a national and European level who are interested in realising sustainable innovations and business ideas. Knowledge development, sharing knowledge and mutual learning are focal point therein. To this end, the RTM Innovation Lab develops and manages an international network of young people (young professionals, entrepreneurs, creative persons and students), theme experts, knowledge institutions, investors and companies.

INHolland University of Applied Sciences in Rotterdam has various so-called work-experience companies that operate as a company for the organisation, but also for the external environment. Three examples thereof include:

1. the Legal Advice Centre is the work experience company of the School of Law which is managed by higher vocational education (UAS) law students and students of Social Legal Services who handle and settle legal issues for civilians and organisations in the four Rotterdam sub-municipalities. They do this in the form of a differentiation Minor;
2. NEWb is the work experience company of the School of Communication & Media. In the second year, all Communication & Media students are involved in this work experience company for one term. In concrete terms this means that teams of approx. 5 students are linked up with external clients: large-scale assignments suitable within the framework of the study are carried out for these clients under the supervision of lecturers. Students work 3.5 days at NEWb, which is an intensive introduction to the field of work and practice;
3. The Entrepreneurial Service Centre is a work experience company of the School of Economics where intermediate and higher vocational education (MBO/UAS) students work and where UAS students and companies can go to for: work placement and graduation places, placing vacancies, offering (commercial) projects and reporting guest lecturers. The Entrepreneurial Service Centre is always looking for professionals from the business sector who will come to university to tell about their experiences in practice. This way, students are encouraged to learn about the latest developments in their field of expertise and study. At the same time, contacts are made with companies in Rotterdam area where our lecturers can go to for Incompany training programmes. These are days during which a lecturer does work experience in a company or institution.

4.6 Alumni

4.6.1 Contact with alumni

Contact with graduates forms part of the contact with the professional field, as the former students are in fact the new talents working in the field. The institutions pursue excellent relations with their alumni and the social partners. Positive contacts between the institutions and their alumni are of vital importance to all parties concerned. Alumni retain access to knowledge and provisions and can support the institutions by thinking along, organising and providing financial support. This way, institutions take advantage of the experience that alumni bring from 'outside'. In addition, positive contact with graduates is important for building and maintaining relations with the business sector, government and social organisations, when providing information on career options to current students, when attracting guest lecturers and with a view to philanthropy in the form of donations to the alma mater.

Alumni research is used to monitor how students look back on their study and what they come across in their career. Here the focus lies on how we can use this information to further improve the quality of education and offer it with a greater emphasis on practice. In addition, graduates are offered continuous support through job banks. Contacts with alumni are maintained through knowledge congresses with professional theme gatherings organised specially for them.

After graduation, some of the higher professional education (UAS) students opt to develop further through a (scientific) Master's degree programme at a university. That progression is facilitated by offering students who make that choice a progression Minor that ensures that students, when graduating, have a sufficient level to complete the Master's programme successfully. Agreements to that end have been entered into between Rotterdam University, INHolland University and the Delft University of Technology as well as with the Faculty of Economy at the Erasmus University Rotterdam.

4.6.2 Lifelong Learning

The European Committee has indicated policy objectives in which lifelong learning is labelled as one of the instruments in order to achieve the Lisbon targets. After all, a knowledge-based economy enhances the need for lifelong learning. It further generates a rise in demand for specific postdoctoral study programmes.

The Rotterdam region, with its specific situation of low average training level and high knowledge requirement for economic development, has a high potential market for students of ages 25 and over. The business sector in particular shows a strong increase in demand for further education and study programmes, both in the fields of professional and executive study and training programmes. The institutions offer contract teaching for a multitude of themes, contributing to the option of lifelong learning for our graduates and inquisitive people in the city and region. Where possible, cooperation is sought within all these variants.

The way to bring these potential students to a fitting course of study at one of the universities has, in large part, still to be developed. European or OECD averages for life long learning are not yet met. Close cooperation between the universities and the world of work is important to succeed in this matter.

University

Erasmus University Rotterdam (EUR) understands the requirements and the need for professionals to excel in a fast changing international market. Business nowadays is

increasingly global and collaborations are often performed on a rapidly expanding international stage. As a result, there is a growing demand for professionals who can combine specific knowledge of a particular market with international and intercultural management skills. That's why the EUR offers what they call post-experience programmes in several categories. The university offers about 20 post-experience MSc or MBA programmes, 13 post experience non-master programmes, about 40 master courses and executive trainings and a large number of separate short-term courses. These programmes and course are in several disciplines, such as Management, Economics, Social Sciences, Health Science, Health Management, Culture and History. Examples of master programmes are Maritime Economics and Logistics, Hospitality Management , Management of the European Metropolitan Region and Urban Management and Development.. Approximately 4500 people attend these programmes and courses each year.

EUR offers an extensive package of post-initial education. One such example is a Post-graduate Master's in Business, Corporate and Maritime Law. This programme is geared to three specialisations that focus on current developments in the three core areas in business, corporate and maritime law. Characteristics of this course are excellent skills training (such as contract drafting), an interdisciplinary approach, a strong link between theory and practice and very good job perspectives. The Erasmus Postgraduate LL.M. in Business Corporate and Maritime Law is designed to provide candidates with the theoretical and practical knowledge to understand the global environment of international commercial practice. By focusing on current developments in the three core areas of business, corporate and maritime law, the programme gives lawyers the practical skills necessary to deal with business problems and disputes, whether in an international or national context.
Another example is the post academic Master's degree programme of City Developer. This two-year Master's programme of area development is aimed at professionals with an academic background. This course is organised through a joint initiative by Erasmus University Rotterdam, the Delft University of Technology and the Rotterdam Development Company. This course is characterised by a strong input from the local authorities, while the Rotterdam region often serves as venue for study projects and dissertation research. The municipality is also an important supplier of participants who can apply the newly gained knowledge in the Rotterdam practice.

The Technical University Delft offers post-initial education actively. Some of these activities are organized by a private company of the university called TopTech. Besides the organisation, individual departments offer post-initial programmes, such as TBM with their Shell Project Academy and Architecture with their Urban City Developer. The department CiTG is active in the foundation Post Academic Education, that offers short-term courses in the area of civil engineering and building. The department of TNW offers two design programmes.

TopTech offers a Master of Security Science and Management as of 2007. This is the first academic master programme in The Netherlands focusing on prevention of safety intrusion. In its most extreme form this is terrorism, but attention is also given to hacking, fraud and sabotage. Overarching theme is safety of society. Several dimensions of safety are linked to one another. The programme is targeted at managers and advisors from all relevant sectors of society and industry that involve elements of security or terrorism prevention in their work.

The faculties 'Building and Architecture' and Technology, Policy and Management are responsible for the content of the master. The safety and security of the TU campus itself provides the most prominent case study for the students. Moreover, the master stimulates the creation of a new research group within the faculty and knowledge exchange with private business community leading to new contacts, input on the content of the master and additional funding.

University of applied sciences

A separate category of prospective students for Rotterdam University and INHolland University focus on are the older students who, in the course of their careers, still wish to take

up a higher education. They are often people who completed a study at senior secondary vocational education (SVE) level and who develop in their careers to job profiles that require a qualification at the level of higher education. Part-time courses geared to the work situation of the person involved are suitable in that respect.

In its strategic plan Rotterdam University has defined life long learning as one of the four main tasks for the University. In the student body of the University 22% of students are age 25 and over. The University organizes part-time curricula for most of the courses offered. These are specifically targeted at students who are employed in a job relevant to their field of study. About 15% of the student body (4300 persons) is enrolled in one of these part-time study programs. For most of the Master courses of the University enrolment is reserved for students with some years experience in the relevant field of work (mid-career masters). Apart from the regular, government funded courses leading to Ba and Ma degrees, Rotterdam University organizes privately funded courses leading to specialist Ma-degrees (with national accreditation) and also shorter post-initial study programs, for instance in Management, Health care and Education.

Over the past years Rotterdam University has developed a practice of assessment of previously attained competence (EVC), as basis for a custom-made study program to a BA-degree. The University is now a nationally appointed centre for EVC-assessment. The University has a strong tradition in providing 'second chance' education to students who realize at later age that they did not achieve their full potential in their initial education career. Students over 21 can enter University on the basis of a 'colloquim doctum' procedure, without meeting the regular entrance requirements. Several hundred do so each year.

At INHolland University, lifelong learning is considered vital for the environment though it is not explicitly mentioned in its strategic plan. It covers plans and actions both for their student body as well as for teaching staff and employees in general. InHolland offers part time programmes in all of their educational departments. These studies are mainly aimed at students who are already employed in that particular professional field. INHolland is currently developing EVC programmes to ensure fitting programmes for these students in order to enable them to finish their studies in the best way possible and without unnecessary delays. INHolland also offers students over 21 the possibility to start a higher education programme, even if they do not have an entrance degree. For that they need to pass a test specifically designed to be able to enter into the regular programmes INHolland offers. Lifelong learning is also promoted and realized through activities with alumni. Essentially, as a learning environment INHolland also promotes such activities with their own employees. This is done by designating a fixed percentage of the overall budget to enable staff and employees to take courses in their field. In that way they keep up to date as far as knowledge is concerned, but these programmes also extend to so-called ''leerstages'' and other forms of education and learning where staff is encouraged to do internships in the same fields their students will start their profession in.

4.7 Cooperation

As stated in the introduction, increasing the educational level and participation of the Rotterdam population is of vital importance to the urban development of the city. Hence an important part of the municipal policy is aimed at contributing to these objectives, not only within the social-economic policy, but also within the spatial economic policy. In the fields of talent development and the labour market, there are a number of alliances between relevant partners in the region:

- The Boards of higher education institutions, the ROCs and the overall Boards for secondary education have found a joint ambition with the Municipality of Rotterdam in

making a consolidated effort to ensure that each talent in Rotterdam develops to his full potential[23].

- The Student City project has been carried out as part of an alliance between the higher education institutions and the municipality, with the objective to project the city as an attractive city for students and young professionals to live in.
- With a view to promoting the progression between higher professional education (UAS) and university education (UE), agreements have been entered into on promoting the mutual progression between higher education institutions. The progression from UAS Bachelor's degree programmes to UE Master's degree programmes has been stated before. Arrangements have been made to enable a transfer without loss of time for university students who find that a study in UAS would suit them better.
- On the invitation of the municipality, the chairmen of all higher education institutions participate in the Economic Development Board Rotterdam, endorsing the importance the municipality attaches to the contribution from higher education institutions to the development of the city.
- Rotterdam University and the INHolland University have mutually coordinated the range of courses in the city, with the objective of realising a joint study offer that represents the best possible match to the needs of the region without unnecessary duplication.
- The municipal house building programme is aimed at building more houses for groups having enjoyed intermediate and higher education. The facilities policy and the policy aimed at the physical living environment too focus on making the city more attractive to retain and attract new residents from the higher middle groups.
- Knowledge from the universities and the higher professional education (UAS) institutions is used for urban development. An example thereof is the cooperation between EUR and the Rotterdam Development Company in the development and implementation of the Master City Developer.
- Focal point within the social economic policy of the Municipality of Rotterdam is increasing the level of education and participation of the Rotterdam population. This manifests itself in numerous initiatives taken by the education sector, the business sector and the government together. This varies from initiatives aimed at ensuring Rotterdam residents leave school with a basic qualification with continuing learning curves that extend to intermediate pre-vocational education (VMBO)/SVE, SVE/UAS, UAS/university, as well as offering (short) modules aimed at training the workforce in the Rotterdam business sector.

The Student City programme has been set up in conjunction with the knowledge institutions in order to commit students to the city at both the beginning of their study and after completion thereof. Student City is an urban alliance with the objective of (economically) binding highly educated young people to the city. With nearly 60,000 higher professional education (UAS) and university students, Rotterdam is the third student city in the Netherlands. A relatively small number of students continue to live and work in Rotterdam after having completed their study. The Student City programme aims to bind Rotterdam UAS and university students to Rotterdam in the fields of living, working, recreating and learning, during and after their study. From 2006-2009, Erasmus University Rotterdam, various universities, Rotterdam Marketing, the Municipality of Rotterdam and Stadswonen work together within StudentCity/RotterdamLife.
INHolland University, together with the INHolland locations of Delft and The Hague, has set itself the objective to link up the economic strength of Rotterdam and the Rijnmond region with the technology of Delft, innovative greenhouse farming in the Westland region and other Greenports, and the legal and administrative knowledge of the Municipality of The Hague and the Haaglanden region.

[23] Deltaplan Rotterdam Education, April 2009

At its campus, the Delft University of Technology wishes to realise a regional concentration of higher education. To this end, it has entered into cooperation agreements with The Hague University of Applied Sciences/Rijswijk Technical University, Rotterdam University and the INHolland University. The agreements provide for intensive cooperation and the physical relocation of a number of higher professional education (UAS) study programmes to Delft. As a result, a strongly coherent, efficient and attractive offer of technical university and UAS programmes is created. The Randstad conurbation region offers opportunities to further bundle the strengths of the Universities located there. Strong reference points in that respect are offered by the cooperation between the Delft University of Technology and Leiden University. Together a range of science and technical study programmes have been developed with a proven track record of attracting students. Examples include molecular science, mathematics, information science, physics, nanotechnology and biomedical sciences. The Delft University of Technology wishes to enhance this relation. The Delft University of Technology and the Erasmus University work together along the lines of research, particularly in the fields of (bio)medical technology and transport. This cooperation has led to the development of joint courses and graduation variants.
INHolland University recently conducted research into the needs of Rotterdam SME and set up a project organisation (IN-ZICHT-IN) with a view to sharing knowledge and sustainable development by and with SME. The Surfshare project "TOEKOMST" is aimed at opening up existing knowledge sources. This research was conducted with the engagement of various related organisations (such as the Chamber of Commerce, SME organisations, municipal/government organisations aimed at SME) and with SME themselves. The research studied the characteristics of SME, the knowledge needs and the interfaces that respond to it. SME entrepreneurs often find it difficult to formulate their knowledge needs as concretely as possible. Success factors and interfaces that can respond to this were part of the study.

4.8 Summary and analyses

If we take stock of the above description regarding the state of affairs surrounding the labour market and talent development and the role of HEI therein, it leads to the following summarising and critical observations:

- In the field of the economy and labour market, all stakeholders involved realise that the economic and social development of the city requires a substantial growth of the number of more highly-educated people in the labour market. There is a risk that the opportunities offered through rejuvenation and diversity of the urban population are left unused, leaving a split in terms of knowledge and prosperity in the city.
- The analysis that a joint focus on the key areas for that development of the city, specific education for the innovative, future professional practice *and* regional cooperation in knowledge creation and distribution is required in order to achieve that the objectives of the municipality are endorsed. The local HEIs cover all important knowledge areas and study programmes to that end.
- However, that does not mean that this focus and cooperation are demonstrably and sufficiently present. A sense of urgency still often appears to be lacking. There are examples of initiatives by the municipality that provide a positive stimulation, but the role of the municipality could be greatly enhanced when the priorities are shared and actively picked up by the different municipal services in a coordinated effort. There are positive examples of widely set up and intensive alliances between companies/institutions and HEIs, acting as partners in education and knowledge development, but the greater part of the potential in that field, particularly within SME, remains unused. This can partly be attributed to the fact that many companies pursue a short-term primary focus, whereas productive cooperation only thrives on the basis of shared ambitions in the medium to long term.

- The HEIs make a demonstrable effort to offer high-quality education that links up with the diverse student population. Their focus is aimed at guiding each student to the most suitable study programme and stimulating him to perform to the best of his ability. The results in that field still leave much to be desired. Although work is carried out on structural cooperation with the education sector in order to provide proper ongoing learning programmes, that field too shows ample room for improvement.
- The limited attractiveness of the city as a place to live for more highly educated people *and* the still modest practice in the field of alumni contacts and post-initial schooling result in a large part of the efforts by Rotterdam HEIs ultimately benefitting other regions.

4.9 SWOT analysis

Strengths	Weaknesses
➢ Population composition (large diversity and young); Dynamic and creative potential. ➢ Adequate and extensive offer of courses available, aligned with the regional job market and the diverse population. ➢ Large number of students that know Rotterdam. They study and do internship in the city. ➢ Proper knowledge institutions in the city, that know the city, research it and publish accordingly. Education is linked up with the problems in the city. ➢ Large numbers of master students. ➢ Willingness to cooperate between (knowledge) institutions, aimed at concrete objectives.	➢ The R&D departments of most multinationals in Rotterdam are not positioned in Rotterdam, but rather abroad. ➢ Mismatch between the qualities and demands of alumni and the characteristics of the city of Rotterdam. There is no bond between students and city. Talent is not retained for the city, students leave after having completed their study. Exodus of graduates. ➢ Lots of SME with little contact with higher education and no common demand. This is a weakness in the system. ➢ Many lower educated people (and premature dropouts). Progression to higher education below standard, including return. Mismatch between supply (less educated staff) and demand (more highly educated staff). ➢ Little practice surrounding lifelong learning: “merely a phrase”. No alumni policy in terms of adequate offer of return education.
Opportunities	**Threats**
➢ The creation of a new middle class, reflecting the diversity of the population. ➢ Increasing the regional ties of HE graduates, by improving residential and living climate and living quality of the city. ➢ Number of vacancies (threat of an ageing population), 40,000 new vacancies per year, 26,000 vacancies for higher educated people. ➢ Enormous talent potential. High potential of less educated people for retraining. ➢ Development of an adequate alumni policy. ➢ Sense of urgency further enhanced due to credit crisis.	➢ Dominant attention to the fringes (lower end) of the labour market which is traditionally large in Rotterdam and will continue to be so. Risk of insufficient attention to HEIs in policy because of this situation. ➢ Dominance of short-term policy in SME and knowledge institutions. ➢ Little innovative policy of companies. ➢ Lack of means to adequately tackle the challenges of educating a diverse population. ➢ Possible relocation of companies as it is not possible to fulfil their higher education vacancies.

5 CONTRIBUTION TO SOCIAL, CULTURAL AND ENVIRONMENTAL DEVELOPMENT

5.1.1 Introduction to sustainable social and cultural development

Chapter 3 discussed regional development from an economic development perspective, with the focus on cooperation and innovation. This chapter requires a wider interpretation of this concept from the notion that regional development must not favour a single target group. Instead, the social, cultural and economic development of all groups in the region is important to long-term, sustainable regional development and growth, with an eye for diversity, cooperation, social responsibility and social entrepreneurship.
Rotterdam has to contend with an imbalanced population composition featuring a substantial underclass, a smaller middle class and a limited upper class . This composition has changed little because the economic circumstances of residents improve they tend to move to the surrounding suburbs.

In order to enhance the quality of life in the city and tackle the urban problems, the current Municipal Executive is carrying out a programme in which participation and commitment are the key words. These words are in direct line with the core issue of this chapter.
The objective of the programme is to raise the average level of education and income, increase the number of people who are socially active and have more people undertaking paid work. In some districts, this task is enormous, for example with , more than 40% of the workforce unemployed and with more than 15% of the population living on social assistance benefit. In other districts, 60% of the local population have very limited levels of educational attainment and fail to reach the level required for jobs available in the region.
The theme of 'participation' is aimed at activating and increasing self-reliance among the Rotterdam population, with special attention to children. Currently, 60% of children in Rotterdam grow up in a problem district, in circumstances where they face multiple disadvantages. 'Commitment' must lead to an improvement in the quality of life in the districts so that more people feel a bond with their neighbourhoods and districts, with a willingness to make an effort. This further involves special attention to sports, leisure activities and a cultural offer that meets the demand of the district.

All four knowledge institutions are in many ways involved in these urban problems, with different focuses and accents, depending on the study programmes they organise. This involvement by means of study work placements, education projects, graduation projects and research has been extensively discussed in the previous chapter. In this chapter this can be supplemented with examples such as:

- the Legal Advice Centre, where EUR students offer first-line legal aid, free of charge, with special attention for local residents who are socially and economically in a weaker position;
- the Income & Debt department of the welfare organisation Centre for Service Provision set up in conjunction with Rotterdam University and currently staffed by students of the university. This department helps anyone with financial problems and debt management;

- the Cross Over project, in which INHolland University and ROC Zadkine work together to involve disadvantaged foreign women in society to a greater extent and ultimately increase participation in education programmes.

Instead of taking a comprehensive view we have opted for a more limited focus. We have applied this focus by concentrating on 3 key areas within the municipal policy concerning social and cultural issues, that is. youth care, health and district development. The limitation has been sought by opting for projects in which multiple knowledge institutions cooperate, involving a sustainable alliance with proven results that are innovative in terms of product or process. The descriptions of these projects are set out in a clear framework. The SWOT analysis at the end of the chapter is based on interviews conducted with people holding key positions within the projects. The main topic for the interviews was the role of knowledge institutions within the project in terms of knowledge development and knowledge distribution, the quality of the cooperation and the effectiveness of the cooperation.

A disadvantage of this specific focus is that many other useful, inspiring and creative projects are not included in this chapter. Many projects can be listed in which the knowledge institutions, based on education and research, take up their role in the social and cultural development of the region and help in progressing solutions to the urban problems in the Rotterdam region.

5.1.2 1st key area: integral district development

One of the most appealing programmes in the field of integrated urban renovation in the Netherlands is 'Pact op Zuid' (Rotterdam South Pact). The programme has the ambition to compensate for the disadvantages in the social, economic and physical fields in the districts of Rotterdam South compared to other districts in Rotterdam, within 10 years. Pact op Zuid is a coalition between four housing associations (Vestia, Com-Wonen, Woonbron and Woonstad), three sub-municipalities (Charlois, Feijenoord and IJsselmonde), the Municipality of Rotterdam and the central government. In 2006, these parties agreed to invest EUR 1.4 billion in 10 years' time, in addition to regular budgets and previously planned investments.
Rotterdam South faces serious problems as the districts lose their attraction to current and possible future residents. Current residents move house as soon as they can and their place is taken by new, relatively 'weak' residents. As a result, unemployment rates in Rotterdam South remain high with all its negative social-economic consequences.
The coalition partners in Pact op Zuid shared the opinion that an integral, joint approach for Rotterdam South could yield more than the sum of individual efforts. The objectives of Pact op Zuid include stopping the process of selective migration, higher labour participation and educational level, reduced dropout rates in vocational education, more houses of higher value and an increase in commercial activities and employment.
Current and new projects have been clustered around these objectives in 5 pillars and 5 chance cards. The 5 pillars are active within Rotterdam South and aimed at a specific issue (economy, social, physical, safety and art & culture). The 5 chance cards provide large-scale developments the scope of which reaches beyond Rotterdam South. An example of a chance card includes Stadion Park, the area around football stadium 'de Kuip'. In the years to come a new stadium will be built, the Top Sport Centre will be expanded, a skating rink constructed and 'Huis van de Sport' developed. The area is set to become the showpiece of Rotterdam sports city.

All knowledge institutions contribute to research or projects that form part of Pact op Zuid. Within the universities, the senior lectureships in particular are involved in the research, as they are specifically aimed at applied research that is important to the region. At the INHolland University, for instance, it involves the senior lectureships Dynamics of the City, Urban Education and Youth Policy and the Living Environment of Youth. At Rotterdam University, the senior lectureships Growing up in the City, Transurban, Enhancement of

Vocational Education and Participation, Labour and Health, among others, are actively involved.
Institute DRIFT of the Faculty Social Sciences and Philosophy are involved in Pact op Zuid through EUR.

In June 2007, Rotterdam University and the INHolland University signed a letter of intent with the steering group Pact op Zuid for a cooperation of at least 4 years. The universities affiliated to this by the prospect of deploying students for work placements, graduation and project assignments at a large scale. In addition, the senior lectureships will stimulate the knowledge distribution in Rotterdam South.

A number of appealing projects in Pact op Zuid in which the HEIs are actively involved include:

The municipal service OBR has converted the last silo at Maashaven into unique multi-tenant business premises called the **Creative Factory.** The premises were officially opened in May 2008. Young, new entrepreneurs in the fields of media, fashion, music, design and business services rent commercial units in the Creative Factory for a period of 4 years. Thereafter, they are deemed to find space elsewhere as re-starters. The Creative Factory offers starting entrepreneurs coaching, and matches companies to each other, external clients and partners of the Creative Factory. They include Rotterdam University and the ROC Albeda College. Currently it accommodates around 60 entrepreneurs.
Even before the opening, the demand for space exceeded supply fourfold. Hence the Creative Factory is currently expanding through satellite branches in the surrounding districts in Rotterdam South. In addition to office space, the Creative Factory also offers space for events local initiatives can take advantage of. In 2006, Rotterdam University entered into a partnership with the Creative Factory. It offers the university students the opportunity to contribute to innovative initiatives in the city and to be introduced to entrepreneurship through a work placement company. Starting entrepreneurs can use the knowledge of lecturers and students of all study programmes at the university. The university has a dedicated space where students working on a project, work placement or graduation project can find a workplace. An example thereof includes the students of the Rotterdam Business School who are currently working on export plans for a number of small companies in the Creative Factory. In addition, an HR staff member is present in the Creative Factor for a couple of days a week, acting as intermediary for questions that he entrepreneurs may have for the university and vice versa.

Project Office **Het Jonge Noorden op Zuid** is an initiative by the INHolland University of Applied Sciences. It realises partnerships between different Rotterdam organisations and the university and as such brings together different disciplines, as a result of which they work together on projects that serve a social interest. The Project Office was set up in 2002 and has also been represented in the Feyenoord district in Rotterdam South since 2005. The projects taken up by the Project Office always exceed the educational framework and thus students work together in multidisciplinary teams. Expectations are that in 2008-2009, another 40 to 50 students will carry out an assignment of 'Het Jonge Noorden'.
Mentoraat op maat is a 3-year pilot between the Project Office and the ROC Albeda College that was started in 2005. The objective of the project is to reduce dropout rates of students of intermediate vocational education (MBO) by means of coaching by students of higher vocational education (HBO), stimulating their progression from level 3 to levels 4 or 5, their entry into the labour market or advancement to an HBO study programme.

On 10 July 2009, 35 apartments of the **Dordtselaan student accommodation** were delivered. Students who wish to contribute to society can live here in a renovated apartment at an extremely attractive price. Dordtselaan student accommodation is an initiative between Woonstad Rotterdam, the Municipality of Rotterdam (sub-municipalities of Charlois and Feijenoord), Pact op Zuid, Rotterdam University, the INHolland University of Applied Sciences and the Erasmus University. Students of the three Rotterdam knowledge institutions can live in the apartments while having to work on (long-term) issues in the district. In exchange for their efforts of at least 4 hours per week (during time off or as part of work placement) they receive a discount on their rent of up to 8%. In due course, the issues are linked to the study and, in addition to rent reduction, credits can be earned. The social and economic projects the students work on will improve the quality of life in the district. Examples of projects that are currently live are researching the opportunities for entrepreneurs in Dordtselaan when the Tour de France 2010 will pass through this road, setting up a students' restaurant and starting homework guidance for local children.
The second delivery of approximately 35 apartments is planned for December 2009. The aim is to have around 250 premises renovated in 2013, resulting in approximately 750 student apartments.

Researchers of the knowledge network 'Growing up in the City' of Rotterdam University, on the instruction of Pact op Zuid, developed a monitoring and evaluation framework to assess the impact of the Pact op Zuid programme. The system must assist administrators in managing the Pact by providing evidence as to whether the Rotterdam South districts are making progress in achieving the previously described sustainable development objectives, the pace at which this happens and other important trends. The system further provides an insight into any threats and maps out potential stagnation. In addition, the monitor must support the innovative learning processes between the cooperating projects and organisations, between administrators, entrepreneurs and residents in Pact. The challenges in the development of the monitor lay in the fact that it had to become a survey-able instrument that would not inundate the administrators with information, that would be acceptable to all parties involved and that represented an appealing product, creating an interest in the programme and its effects.
The main product of the monitor is the Travel Guide. This guide consists of 60% illustrations and 40% text and statistic data clustered around the key indicators of income, safety index, house value and neighbourhood satisfaction. The first publication **'Travel Guide 2008'** includes the zero measurement. The figures and developments presented therein relate to the period preceding the start of Pact. The Travel Guide is a success as it is a way of organising information that appeals to those involved and it invites them to discuss the results and effects they observe themselves. Students of social and architectural study programmes have been used to make pictures and interview people in the street. The monitor will be carried out on an annual basis and expanded to include other sub-municipalities in Rotterdam South.

The foundation **Pot met Goud op Zuid** was formed in January 2005. Fifteen intermediate/higher (pre-) vocational education institutions (VMBO/MBO and HBO) active in Rotterdam South work together with the objective of encouraging students to become socially active by doing voluntary work. In consideration of their efforts they receive gold coins which can be exchanged for a benefit (e.g. in the form of a ticket for a home match of Feyenoord football club, an event in AHOY, indoor sporting arena or a visit to Blijdorp Zoological Garden or sports and games). The contribution of the ROC and university students consists of guiding other students and coordinating activities, ranging from homework guidance, helping the elderly, cleaning up public objects in the neighbourhood, etc. The idea is that young people learn that doing useful deeds can also be rewarding and satisfying. Other learning elements for the students include social and coaching skills. The activities are coordinated from a project office with a number of fixed staff and students from the INHolland University of Applied Sciences and Rotterdam University.
This project also plays an important role in the social stages. As from 2011, secondary education students, as part of a fixed element in the curriculum, must do 72-hour work placements with a social/cultural organisation or institution, distributed across their entire school period. Rotterdam South serves as a pilot area in which 2500 students will do a social work placement this year. Pot met Goud op Zuid acts as intermediary for these work placements, involving active visits to schools and organisations. Higher vocational education (HBO) students also adopt a class (particularly in intermediate (pre-) vocational education (VMBO) and decide together what type of social work placement they could do. The results are offered to the educational institutions and students can use this to in making a pro-active start in terms of providing a framework for their work placements.
The foundation has a budget of approximately €200,000 subsidised by e.g. the Youth, Education and Society (JOS) service, Oranjefonds and municipal subsidies.

As pointed out previously, art and culture is one of the five themes of Pact op Zuid. The higher education institutions play a role in the cultural development within the region with projects like HAND IN HAND; a neighbourhood level project. Students from CODARTS (University of the arts) and the senior lectureship Community Arts cooperated with the Rotterdam Neighbourhood Theatre, to engage citizens who are normally not that interested in arts, acquainted with the project. The celebration of 100 years Feyenoord (soccer club) initiated the project resulting in a tenfold sold-out performance in 2008. This show was designed and performed by local citizens, Feyenoord supporters and performers from elsewhere in Rotterdam. The senior lectureship and CODARTS directed the performance. In total it took over a year to complete the project.

5.1.3 2nd key area: health

Internationally, the Netherlands holds a secure middle ranking position in terms of health and average life expectancy. However, the largest cities in the Netherlands, including Rotterdam, perform significantly less well than the rest of the country. Within Rotterdam, health in its turn shows an imbalance between localities. The death rate in districts of the lowest income is 13% higher than in districts of the highest incomes. An unhealthy lifestyle (such as overweight, drinking alcohol and smoking) is more common among less educated people on lower incomes. In Rotterdam, the percentage of obese people is higher compared to the average in the Netherlands. An alarming aspect is that Rotterdam has relatively more overweight children compared to the rest of the Netherlands. In terms of its environment, Rotterdam is a junction of motorways, water ways and air traffic. Many districts have been

constructed in high density with inadequate open space, landscaping and playgrounds. These are all factors lead to health being identified as an important theme in the Rotterdam region. Health and 'Participation' are in direct relation to one another. Key areas in the programme of the Municipal Executive are improvement of lifestyle, psychological health, the living environment and increasing the self-reliance of citizens. The Erasmus MC and the Rotterdam-Rijnmond Municipal Health Service (GGD) work closely together under the theme of 'the Healthy City' in numerous projects aimed at for instance aging healthily, the growth and health of children, the issues of home confinements in disadvantaged areas, the role of societal healthcare and the relationship of migration, ethnicity and ethnical differences in health and health care. In annex 5 a list of these projects is included.
In addition, it is important to keep healthcare accessible, of a high-quality standard and affordable. This can be done by stimulating innovation and entrepreneurship in healthcare. In January 2008, the implementation of the Economic Development in the Rotterdam Healthcare programme was started. The Rotterdam Development Company has a directive role in this programme in relation to a number of municipal services such as the Rotterdam-Rijnmond Municipal Health Service (GGD). The programme involves active cooperation with various care providers, knowledge institutions, such as Erasmus University, Erasmus MC, Rotterdam University, Delft University of Technology, alliances, such as Medical Delta, sub-municipalities, programmes, such as Pact op Zuid and the development of Care Boulevard and companies.

During the past years, in cooperation with municipal services, knowledge institutions and organisations, various projects and programmes have been started and carried out. Two appealing projects in which HEIs are actively involved include:

Generation R studies the growth, health and behaviour of nearly 10,000 children growing up in Rotterdam. These children are monitored from the early stages of pregnancy until their 18th birthday. The question why certain children develop to their full potential whereas others do not is focal point therein. The factors influencing this development and with that related questions such as why infancy death rates in Rotterdam are relatively high, the effects of deciding for or against breastfeeding, whether illnesses can be prevented, the consequences of growing up in a deprived area and how the differences in health between ethnic groups can be explained all form part of this study. This way Generation R makes an important contribution to the health of and care for all children and their parents in and outside Rotterdam and the Netherlands. It enables policymakers to better align and gear the care to those groups who need this care most.

Generation R is unique in that lots of information about the children and their parents is collated as early as the pregnancy stage. In addition, the composition of the study group is extraordinary, as children of practically all ethnic groups in the Netherlands are represented therein. This is important, as it becomes increasingly evident that growth, development and health between these groups show significant differences.

As from 2002, during a period of three years, nearly 10,000 pregnant women consented to participation in our research. Therefore, all Generation R children have now been born and this group will be monitored until they are 18 years of age. In this period (until 2022), the latest methods and technologies will be used to collate a maximum amount of information about the children and their parents.

Generation R is a study by the Erasmus Medical Centre and Erasmus University Rotterdam in cooperation with the Netherlands Organisation for Applied Scientific Research (TNO), Rotterdam Rijnmond Municipal Health Service (GGD), Parent and Childcare, Haven Hospital, Instituut for Tropische Ziekten B.V., Ikazia Hospital, Maasstad Hospital, Sint Franciscus Hospital, STAR Medical Diagnostic Centre, Leiden University Medical Centre, VU University Amsterdam, University Medical Centre Groningen and Wageningen University. All family-oriented care providers are also closely involved with Generation R (such as family doctors, specialists, early childhood health centres, pharmacies, teachers of the children involved).

During the first 7 years of this large-scale, long-term study, interesting results have been achieved in terms of both behaviour and health. These results have been published in doctoral theses and scientific magazines. For instance, the influence of depression and smoking during pregnancy in relation to the size of the brain and later development has been established. Ethnicity too appears to be of major influence. Improved foetal growth curves have been developed (per ethnic group) which have now been accepted as new Dutch standards.

'**Op eigen benen'** and '**Op eigen benen Verder'** were studies mapping out how young people with chronic health disorders live, their perspective on their illness and how they want professionals to deal with them as independent individuals. The objectives of the project were to better support young people with a chronic disorder when obtaining self-management and self-reliance and to improve the transfer to adult care. The studies were carried out as part of a partnership between the knowledge network 'Transitions in Care' of Rotterdam University, the Erasmus Medical Centre Sophia and Erasmus University Rotterdam, between October 2004 and December 2006. The study was financed by ZonMw, an organisation for health research and care innovation. The studies were followed up in the action programme 'Op Eigen Benen Vooruit! which was started in the autumn of 2008. The action programme is aimed at the implementation of the improvements in the field of the contents and organisation as recommended in the study. The improvements relate to all institutions where young people with chronic somatic disorders aged 12 to 25 receive care, such as hospital and rehabilitation centres.

5.1.4 3rd key area: youth policy

A total of 20% of residents in the Rotterdam region is younger than 18 and this percentage is set to rise in the years to come. Rotterdam is a melting pot of nearly 170 cultures. Poverty, unemployment, growing up in a deprived area, parents who are not sufficiently familiar with official channels in society and single parents are risk factors that can lead to problems in the upbringing and when growing up. Children in Rotterdam run an above-average risk of encountering problems. For example: 20% of children grow up in families living on or around the social minimum, 30% grows up in a single-parent family and 58% of children have parents born outside the Netherlands. The Rotterdam region has been pursuing an integrated youth policy for many years aimed at the development and upbringing of youngsters up to 18 years old. In this respect, the region is the leader in the Netherlands, for example in the development of the community school approach through which it becomes the centre of integration and participation in the district. The municipal services, youth care, youth healthcare, care for people with minor disabilities, care insurers, knowledge institutions, the police and the judicial system work together in programmes arising from the policy in order to achieve results.

'**Wereld op Zuid'** is the name of the community school that was built on behalf of the housing association Vestia in the Zuidwijk district in Rotterdam South and which was delivered at the end of 2008. The community school is a partnership between two primary schools, a childcare organisation, an organisation offering care for children with a mental impairment and a welfare organisation. Wereld op Zuid is open 12 hours a day for the community school and in the evenings and weekends for other activities. The sports and catering facilities can also be rented by the local residents. The alliance between the different organisations offers children ample opportunity to develop. A social team is active within the community school in order to promote the education and development opportunities for students and to stimulate parental involvement. Rotterdam University assisted in the development of this social team, among other things. Departure point is that a work culture and structure is created that enables the professionals to solve the majority of problems with children and their parents within the community school itself.

In 2008, the INHolland University of Applied Sciences set up **kenniscentrum Brede Scholen**. The primary objective of the centre is to collate information on the community school concept and to develop it further. In addition to disseminating the understanding of the approach for students, future teachers and coaching staff at the Community Schools can also experience the concept. An important element therein is the cooperation between schools across the network. Within the knowledge centre, the senior lectureship Urban Education and Youth Policy and the social-pedagogic study programmes work together. In 2008, the expertise centre organised a conference on community school themes in cooperation with the municipal service Youth, Education and Society (JOS) and Rotterdam University. This exercise is set to be repeated in 2009. The expertise centre works closely together with project organisations such as the Pot met Goud op Zuid.

Youth work is an important aspect of the integrated youth policy. Youth workers play a vital role in initiating and maintaining contact with hard-to-reach groups. This often involves specific groups of youngsters that need additional support as well as clear boundaries. Youth workers in the region are faced with a difficult task. Since the 1980s, many community and youth centres have been closed down due to cutbacks in public expenditure. During that period, the level of youth work provision reduced both in terms of both quantity and quality. There were insufficient youth workers with the required education and experience. When sub-municipalities started to recruit youth workers, it appeared that professional youth workers were hard to find. The work was associated with voluntary work, hard work and low levels of pay.

As from 2005, multiple developments came together to tackle this issue. In March 2005, 'Youth work in Rotterdam', a memorandum prepared in cooperation with the sub-municipalities and the service Youth, Education and Society (JOS) was published. In the memorandum, it was concluded that the required skills in relation to youth work had to be mapped out in consultation with key stakeholders. Higher professional education (HPE) institutions, within the framework of competency-oriented education were looking for re designing of content of study programmes, so that education provision would be more aligned to the needs of welfare institutions and sub-municipalities. In September 2005, the welfare institutions named Knooppunt Kralingen and Cascade together with Rotterdam University drew up a final version of the competency profile of the youth worker.

The developments led to the formation of the steering group **Ideaal Jongerenwerk** in conjunction with the municipal service JOS, the Safety Project Office, sub-municipality Charlois, sub-municipality Feyenoord, sub-municipality Prins Alexander, the INHolland University of Applied Sciences, Rotterdam University, ROC Zadkine, ROC Albeda College, Welzijn Noord, Knooppunt Kralingen and the DISCK Foundation. The objective of the steering group was to prepare a Rotterdam methodology in youth work, based on the specific features of the Rotterdam youth and the specific social infrastructure. In the summer of 2006, the steering group produced a report describing the functionalities and the key tasks of youth work. Subsequently, the qualitative improvement in youth work was put in place by means of an assessment programme and expertise stimulation programme for current youth workers *and* by developing a new teaching guideline at intermediate and higher vocational educational levels (MBO/HBO). Since September 2008, this teaching guideline is offered on the basis of an alliance between the INHolland University of Applied Sciences, Rotterdam University, ROC Zadkine and ROC Albeda College. The learning pathway is a specialisation which is linked to the Social Cultural Work course within the ROCs and to the Cultural Social Education course within the higher vocational education (HBO) institutes. The first 17 students started this specialisation in September 2008. Each term, one of the educational institutions acts as host for the students with two lecturers of different institutions responsible for the teaching programmes. The quantitative improvement must be achieved by recruiting 50 FTE youth workers. In 2012, provided the ambition materialises, all youth workers will work in accordance with the Rotterdam methodology.

The youth policy is aimed at all youngsters having equal opportunities to develop, so that they develop into fully-fledged participants in society. This policy is required from a very early age, when diversity appears to be of great influence: for example foreign children in particular who start primary education with language and development disadvantages. At a later age, foreign youngsters often drop out of secondary or senior secondary vocational education without a basic qualification. In addition, foreign youngsters are underrepresented in less formal elements of youth service whereas they are overrepresented in more formal provision Finally, certain groups of foreign youngsters are clearly overrepresented in youth crime records.

The Diversity in Youth Policy programme was developed on the instruction of the Special Ministry of Youth and Family and the Ministry of Living, Districts and Integration. At the end of 2008, as part of this approach, three academic workshops were held, one of which was in the urban region of Rotterdam.
The focal point within the programme is reaching migrants' children and their parents with (preventive) youth police intervention earlier and more effectively. The objective of the programme is to develop knowledge and skills together with the youngsters and their parents, knowledge institutions, municipalities, practice institutions for care and welfare and migrant and youth organisations.
The workshop was organised in the urban region of Rotterdam called **DWARS** by the Rotterdam-Rijnmond Municipal Health Service (GGD), the Erasmus Medical Centre and the Erasmus University, senior lectureships of Rotterdam University and the INHolland University of Applied Sciences, the service JOS, (sub-) municipalities in Rotterdam, welfare organisations, Pharos nationwide knowledge institute, Bureau Jeugdzorg, Ieder Kind Wint and migrants' organisations.

DWARS has set a total of four sub-objectives for the first year. They are aimed at organising a network, collating *and* distributing (local) knowledge, increasing the skill set of professionals and organisations and finally setting up a realistic follow-up plan. In order to achieve these objectives, various activities have been started, in which cooperation between the different organisation and involving migrants always take first priority. First, question-driven consultations have been carried out among professionals, young people and their parents. This exercise produces knowledge of and an insight into the needs, bottlenecks and points for improvement experienced by the target audience. In addition, an extensive listing will be made of the existing interventions aimed at migrant youngsters and their parents in various (sub-) municipalities. The various interventions will be evaluated in a follow-up phase and made available on the website of DWARS. Furthermore, a start has been made with a cross-cultural validation of the Rotterdam-Rijnmond youth monitor, which is used in the Rijnmond region as flagging system within youth healthcare. In order to promote the skill set of (future) professionals, the universities are developing intercultural modules which will be incorporated in the existing curriculum.

5.2 Sustainable development of the environment

Following the paragraph on sustainable and cultural development, this paragraph discusses sustainability from the perspective of the environment and climate.

Chapter 3 focused on a number of innovative programmes on the subject of sustainability, such as Dutch Clean Tech Delta. This paragraph will emphasise the many partnerships and knowledge platforms active in the Rotterdam region relating to this theme. The knowledge institutions are actively involved in these alliances, but of course with different focuses and emphasis depending on the study programmes they organise.

5.2.1 Cooperation programme: climate programme Rotterdam (RCI)

In 2006, the Rotterdam Climate Initiative (RCI) was started. RCI is a cooperation programme of the Municipality of Rotterdam, the Rotterdam Port Authority, DCMR Environmental Service Rijnmond and the employers' organisation Deltalinqs. The programme aims to create a mechanism through which the government, organisations, knowledge institutions and residents work together in relation to the most ambitious objectives in the field of climate in the Netherlands. This involves reducing CO_2 emissions by 50% by 2025 compared to 1990 levels and 100% climate stability in that same year.
The Rotterdam Climate Initiative forms part of the international Clinton Climate Initiative (CCI). Stimulating the use of new technologies and finding practical and measurable solutions are focal points therein. The RCI programme is based on a number of pillars surrounding sustainable city, sustainable mobility, energy port and Rotterdam Climate Proof. The knowledge institutions participate in many fields of the key areas that fall within the scope of these pillars. The innovative examples in a technological field have been stated in chapter 3.

Delft University of Technology focuses on the following themes: the climate in sustainable cities with Rotterdam as test case, sustainable delta technology, CO_2 capture, transport, storage and monitoring, environmental monitoring, such as sensor networks, energy efficiency in which the chain approach is focal point and finally, sustainable entrepreneurship.

> In 2010, Rotterdam Climate Proof will build a water pavilion on the World Expo Shanghai 2010 world exhibition, demonstrating how Rotterdam is and continuous to be safe from the water, despite the changing climate. In the decades to come, the city expects more rain, more river water, more groundwater and a rise in sea levels. The design was prepared by the Willem de Kooning Academy of Rotterdam University. The exhibition expects around 70 million visitors. Through the pavilion, the city wants to be an inspiring example to other delta cities.

Rotterdam University signed the covenant in September 2008. By doing so, the university is committed to incorporate the sustainability theme in the curricula of all its 80 study programmes, to ensure its buildings and internal organisation are managed sustainably and to set up two new senior lectureships in the fields of energy transition and biofuels.

Rotterdam University aims to have integrated knowledge sustainability in all curricula within 5 years. In order to assess the progress made by study programmes to date, the university carries out AISHE (Audit Instrument for Sustainability in Higher Education). This instrument of sustainable higher education (DHO) is used by the majority of the schools for higher education and universities in the Netherlands. The study programmes of Rotterdam University that are affiliated with 'planet', such as the technical, architecture and infrastructure courses, have been working on sustainability for some years now. They have

been inspired to this end by developments within the specific professional fields surrounding their courses.

In the education module Future Urban Mobility of the Car Engineering and Industrial Product Design courses of Rotterdam University, students create vehicles in accordance with the Cradle2Cradle principle. They are asked to make designs from reusable materials in which the origin of materials is verified and taken into account. They must further indicate CO_2 emission levels across the entire energy chain. The students present the designs to experts outside the university in order to make joint progress in terms of developing a recyclable vehicle. The Rotterdam Municipal Public Works Department and Car Recycling Netherlands are involved in the module as external clients.

Each year, Rotterdam University, in conjunction with the Rotterdam Climate Initiative, presents an award to those students who have performed exceptionally well in the field of sustainability whether , individually or as part of a project. The objective of the award is to increase awareness amongst students and lecturers of the sustainability problems but also making a positive contribution to a 'problem-solving climate', both at the university and in Rotterdam society. In 2008, the University Sustainability Award was won by Eveline Bijleveld, Industrial Product Design student, for her Cradle-to-Cradle street furniture. The public Bend Bench designed by her is made of galvanised steel with a fixed single support base that can be fully recycled in the own material channel.

Sustainability is also an important subject in the senior lectureships of Rotterdam University, such as the 'Smart energy' senior lectureship, with focal points such as efficient energy consumption and the transfer to sustainable energy provision. The same applies to the 'New Technologies for Product Development' senior lectureship, which is engaged in the application of the latest technologies and materials in knowledge-intensive products in order to improve product performances. Sustainability is also an important issue in the 'Area Development and Transition Management' senior lectureship in re-designating the use of urban areas.

Delft University of Technology decided many years ago to incorporate sustainability in all its study programmes. The Sustainability Platform of Delft University of Technology, which was engaged in this, is currently preparing to integrate sustainable development in the Delft Research Initiative plans and making sustainability a tangible presence within the campus.

Sustainability is reflected in the courses of the INHolland University and in the projects undertaken by students. The university aims to ensure that each student is engaged in sustainability at different times during his or her study. Ultimately, the sustainable development must be reflected in the curricula,in education and research projects and in facility and renovation/new building projects. This is one of the key points of the long-term project called 'Sustainable INHolland'. The Higher Tourist and Recreational study programme has been given the quality mark of Sustainable Development in higher education. This quality mark is awarded by DHO, depending on the results of an AISHE audit.

The Dutch Research Institute for Transitions (DRIFT) is a research institute based at FSS of Erasmus University Rotterdam. DRIFT collaborates with TNO in the Knowledge Centre for sustainable system innovations and Transitions (KCT). Transitions are structural societal changes resulting from interacting cultural, economic, technological, behavioural, ecological or institutional developments. Transitions provide a key for achieving a more sustainable and innovative society.

The KCT focuses both on scientific research and concrete projects in the fields of transitions and transition management. Its primary goal is to translate theoretical knowledge into practically useful knowledge, and vice versa.

5.2.2 Sustainable management at the campus

Through the 'Greening the campus' (EUR) and 'Greening the Rotterdam university' projects, the universities and schools for higher education aim to make an on going improvement in the sustainable management of their buildings, energy consumption, ICT provisions, waste disposal , transport and distribution channels and facilities. These projects are in line with the national covenants, such as the Long-term Agreements on Energy Efficiency (MJA). In December 2008, as a follow-up to the first generation of long-term agreements on energy efficiency (MJA-1) which was started in 1996, the higher and scientific education sector signed the MJA-3 covenant. As part of this covenant, they aim to achieve a 2% energy efficiency improvement each year by enhancing efficiency in the chain and deployment of sustainable energy. In real terms, this represents an energy efficiency improvement of 30% in 2020 compared to 2005. In addition, the institutions agreed to purchase sustainably for at least 50% of requirements by 2012. Sustainable purchasing does not only include price and quality aspect considerations but also includes wider social and environmental aspects in the decision-making process when purchasing. An example is provided by an invitation to tender for the cleaning contract at Rotterdam University which included requirements in terms of the cleaning agents to be applied, use of microfiber and separation of waste. In addition, in the most recent invitation to tender for the catering contract, the sustainability policies of the supplier, the caterer and in relation to waste composition played an important role in the assessment. The organisation of the university and of the RDM grounds in particular, serves as a test case for sustainable construction, energy provision and management.
EUR signed a mobility covenant that facilitates a reduction in transport usage among other things. In order to achieve this , various initiatives have been started, such as a study into rerouting the tram connection to EUR, promoting the E-bike to stimulate commuting by bicycle among employees and improving the information provision for public transport connections and departure times. Rotterdam University recently obtained an electric car, available for use by staff to travel between the different institute locations in the city.

The premises of the INHolland University were built in 2002 and expanded in 2008. Not only have the buildings been equipped to provide contemporary education, they have also been prepared to do so sustainably. The design and construction have been subject to a critical analysis of the building materials and techniques to be used in order to maximise sustainability in terms of energy consumption. For instance, construction-technical measures have been taken, such as revolving doors at the entrance, air vents, convertible spaces, insulation and the efficient use of space. However, installation-technical provisions also including the use of long-life light sources, detection sensitive lighting, and a heat/cold storage system.

Knowledge networks

KISSZ (Knowledge in Synergy for a Sustainable South Holland) is a network concerning sustainability issues where knowledge institutions in the Rotterdam region come together . This network has been active at a provincial level since 2008, with the objective of developing new perspectives on issues surrounding the climate, space, energy and urban problems. This network does not carry out projects itself, but acts as intermediary and monitors deadlines. KISSZ aims to make a contribution to tackling social issues with a focus on long-term sustainability, by enhancing the connection between the best knowledge available and actions taken. By brokering, facilitating and possibly initiating new alliances, the network further aims to link up knowledge and expertise to ensure that sustainable initiatives are fast-tracked into the implementation phase. It is an open network of knowledge institutions, authorities and social organisations with the objective of bringing together people of various backgrounds, visions and opportunities to focus on a common issue. Affiliations to KISSZ include the five major municipalities (The Hague, Rotterdam, Leiden, Dordrecht, and Delft), the South Holland provincial authorities, three universities (EUR, Delft University of Technology and Leiden University) and three schools for higher education (INHolland

University, Rotterdam University and The Hague University) and the Environmental Federation South Holland. The first forms of co-creation have meanwhile been established: policymakers and knowledge suppliers work together in the development of the Zuidplas Polder and the Rotterdam City Ports and the development for sustainable energy.

AIDA (Studio for Interactive Sustainability Activities) was started in 2002 and aims to generate innovative solutions for sustainability issues. They do this by linking up clients (government institutions, companies or scientific institutes) and students to problems and issues that need urgent attention. The studio is manned by students from various disciplines and scientific backgrounds on their graduation projects. Through these projects, they make a contribution to innovation by working developing ideas into draft designs, concepts, systems and services that can be implemented. In 2008, approximately 40 projects were carried out in the Studio. AIDA is an alliance between DMCR |Environmental Service Rijnmond, the Rotterdam Development Company (RCI), Rotterdam University, Delft University of Technology, EUR, South Holland provincial authorities, Eneco, Stadsregio Rotterdam and the Environmental Federation South Holland.

The mobility problems in the region of Rotterdam are an important issue. The daily capacity of the A15 Motorway to the Port of Rotterdam is already insufficient. The construction of the 2nd Maasvlakte will further aggravate the situation. In 2008, a student of Delft University of Technology, on the instruction of the Directorate-General of Public Works and Water Management, used the Studio to find out whether a micro-dynamic traffic management system can improve the efficient use of existing road capacity. This system makes it possible to give motorists individual instructions. The expected effect is that more vehicles per hour can flow through and that the length of tailbacks will be reduced. A simulation has been used to establish the effects of giving instructions to individual motorists on the traffic flow for a section of the A15 motorway between Maasvlakte and Vaanplein.

The knowledge institutions also organise various events in which interested parties from inside and outside the university can share their understanding on the subject of sustainability, gain inspiration, be informed of the latest developments, develop projects and meet partners. Rotterdam University, for instance, organises a Sustainability Café four times a year. Last November, the 'Rotterdam water city, the road to a climate-proof water knowledge city' conference was held. The conference was organised by the RCI and the Rotterdam University 'Trans-urban' senior lectureship.

5.3 Analysis of the contributions from higher education institutions

When examining the role of knowledge institutions in terms of knowledge development and knowledge distribution concerning the sustainable social development of the region, the quality and the effectiveness of the cooperation, the following can be identified:

- the cooperation in the region between the knowledge institutions, municipal institutions and social organisations within the larger programmes and projects takes place in the context of the quality of the contacts in the different networks; the higher education institutions show strong differences in terms of connecting with the region through the networks, the extent to which they can deploy human resources and financial resources at different levels in local cooperation and knowledge development and the extent to which they can adopt to regional developments and issues;

- the region (still) lacks a tradition of joint knowledge development and knowledge distribution concerning key aspects of regional policy. Consequently, the local stakeholders do not yet take sufficient advantage of each other's strong points or of the knowledge that has been developed. Involving HEIs in the development of an overall vision or in relation to policy development or in programmes for social-economic development in the region from an early stage on is not yet a common practice.
- there is considerable variation in how cooperation between the HEIs and stakeholders in the different programmes is formed and then develops over time. The involvement of *and* the municipality (municipal services) *and* HEIs *and* social organisation is not needed in order for each project and programme to be successful. It *is* important though that the party with the leading role is and feels truly committed to achieving the objectives of the programme;
- based on the vision of the programmes, but also often as one of the pre-conditions for funding cooperation with many different parties is a requirement. This can lead to the fact that the objectives of the cooperation become comprehensive, the cooperation becomes time-consuming, that structures require considerable attention and that many interests play a role. The parties having to (continue to) commit to the programmes for a sustained period of time demanding significant commiment. There is the danger of focus on the programme shifting to other initiatives and the commitment to the principle of cooperation shifting away.
- the Rotterdam region features a lot of projects in the field of social and cultural development with new initiatives started on a regular basis. HEIs find it difficult to properly align projects of a relatively short term (less than one year) to their study programmes. If the cooperation takes place over a longer time scale the HEIs are then better able to align their organisation and their activities to the project and wider social issues and also to guarantee students the quality of education surrounding the project;
- this point does not specifically apply to the Rotterdam region alone, but this chapter shows that the consequences in this region are also clearly visible. Knowledge development and knowledge circulation require financial means. As evidenced in chapter 2, universities in the Netherlands receive a much bigger part of the research funding available at a national level than do the higher professional education (HPE) institutions. As a result, they can contribute much more to knowledge development. However, there are no incentives for university researchers to participate in regional projects rather than focus on the national level. Research that is carried out by the knowledge networks of the HPE institutions is much more rooted in local professional practice and thus local issues. However, due to the limited availability of research funds for these institutions, the knowledge networks of the HPE institutions strongly depend on the financial means made available by the municipality and regional or national projects and programmes. These funds are often are often less in value and shorter term time horizons that research funding. .

  In addition to the limited availability of financial means, the limited experience of applied research by the HPE institutions is part of the explanation for the reason that knowledge networks linked to these institutions are not yet able to take up the powerful role in regional knowledge development. Positive progress has been made and the direction of development is clear, however, further follow-up steps can certainly still be taken in cooperation with local stakeholders.

Strengths	Weaknesses
- strong vision and the policy based thereon towards sustainable social, economic and cultural development of the region and the environmental and climate issues that play a role therein; - substantial, leading expertise and knowledge of local issues at HEIs embedded in Chairs and senior lectureships; - control and initiative of the municipality and other major parties such as housing associations with regard to (infra)structural projects; - strong involvement of the HEIs, depending on their profiles, with the local problems; - level of organisation surrounding local key areas, e.g. project agencies;	- limited local power to promote its successes; - many (sometimes overlapping) initiatives in which everyone participates, sometimes compromising clarity. In some cases, policy is not sufficiently guiding; - Frameworks for cooperation and funding are not sufficiently encouraging to participate. A sense of obligation does not stimulate real cooperation; - insufficient focus on making the results of the projects and programmes sustainable and the translation to new developments; - (use of digital means to) share and organise knowledge; - no sense of urgency among the parties involved to think and take action together, effectively and efficiently and motivated by a local interest;
Opportunities	**Threats**
- local themes such as care, sustainability, diversity and creativity and generating (inter)national interest; - thousands of more-highly educated people becoming available to the local labour market each year; - increasing (social and multicultural) entrepreneurship - community formation; - demand for multidisciplinary approach;	- falling government intervention, research funds and subsidies; - dynamics and complexity between the actors in the region; - Braindrain: higher educated citizens move elsewhere

6 CONTRIBUTION TO REGIONAL COOPERATION

6.1.1 Introduction

The following paragraphs contain an elaboration of regional development from various perspectives. The first part of the section explores the interlacing of the knowledge institutions with the region's three dominant clusters. The second part provides a further examination of the notion of regional interlacing: what does this mean and how does this result in guiding demand? This entailed examining the strong points and best practices, along with the **underlying mechanisms. The section provides starting points for improvement, the elements** of which are (a) cooperation with higher professional education (HPE) and university education (UE), (b) cooperation with municipal services and (c) cooperation with the remaining parties, such as social institutions, companies and care institutions. Finally, recommendations are offered for the required improvements.

6.1.2 Main points in the regional cooperation

Below is a brief discussion of three economic clusters, with special attention given to interaction with the knowledge institutions.

Economic cluster: the Port and Industrial Complex G27

The port and industrial complex (PIC) is the highest priority for Rotterdam. Not only does this complex comprise all the companies in the port area, but also companies in the city and surrounding region (Delft and Drechtsteden). The knowledge and educational institutions are also part of the vision of Rotterdam to the PIC. In the coming decades a comprehensive transition is foreseen to a quality port with high knowledge intensity. New innovative concepts in the areas of accessibility, energy and space are being developed, which will create new economic opportunities and spin-offs for the city. With these knowledge-intensive activities around the main port, Rotterdam also wants to develop into an international energy hub, a global pilot project and international knowledge centre for climate-change issues. This will provide additional economic opportunities in industry and services, including the creative sector. The analysis made for executing the PIC plan nevertheless identified various problem areas with regard to knowledge intensity:

- A working population with insufficient qualifications or specific training to meet the needs of business (i.e. inadequate correlation between supply and demand).
- Poor image of companies in the port as an attractive workplace for various segments of employees.
- Low degree of modernisation of SME (small and medium-sized enterprises) in the PIC. An estimated 1to 2 % of turnover in the port and industrial complex will be spent on R&D (compared to between 4 and 5 % in other sectors). Positive exceptions are industry, chemicals and energy.
- Many subsidiaries of international companies, with decision powers for innovation rest with the parents companies abroad.

- Lack of organising capacity to facilitate (clusters of) companies and translate good business ideas into structurally reinforcing cluster or chain projects.
- Insufficient insight in the scope, growth prospects and (international) competitive position of Rotterdam for knowledge intensive, urban and port-related activities in high quality service provision.
- However, the Port Authority is anxious to play a role in the area of knowledge and innovation, including the implementation of its own R&D agenda and university chairs.

Relation with knowledge institutions
- The cluster assessment is that a good educational structure requires two universities, three UAS and three SVEs (Secondary Vocational Education).
- There is an authoritative, specialist educational programme in areas of process technology and maintenance (STC).
- The TU Delft and EUR are leading institutions specialising in logistics and maritime transport (including maritime law and port economics). They attract international students.
- Nevertheless, there is still insufficient exchange of knowledge between knowledge institutions and companies. The research is insufficiently demand driven, with too few contacts with SME in particular.
- There is insufficient teamwork, joint profiling/marketing and economic valorisation of existing port knowledge in the region. With the Port Authority, the Ideal Port senior lectureship supports business and trade in the port through research, deployment of students, the development of new education, including water management. It also establishes relations with young professionals.

Development of the Medical and Care Cluster

This cluster provides the second largest number of jobs. There are four current programmes:

1. Stimulating knowledge alliances and knowledge valorisation.
   It comprises innovation and entrepreneurship within cure, care, prevention and the welfare sector. Medical Delta and the *Zorgportal* (Care Portal) are knowledge alliances. There is an alliance of knowledge institutions geared towards fostering entrepreneurship via Incubator (Erasmus MC) and Biomedical Fund. This also concerns products and services, for example, household help. This is a growth market.
2. The labour market and training.
   There are ongoing studies about occupational training and numbers of students. There is an action programme of questions relating to the labour market, with plans for influx and transfers.
3. Area development for health care provision
   Area development gets much attention, particularly around Erasmus MC and Maasstad. There should be considerable spin-off from this. The knowledge centre of the residential areas (housing associations), geared towards ideas about residential care, is involved. The Coolhavenprojects aims to develop 25.000 m^2 for R&D related activities.
4. Self-reliance.
   To close the gap between supply and demand, fostering of self-reliance is mentioned via products and services. This includes the Internet facilities, Rijnmond Care Portal and Domotica (telemetric applications). A feasibility study will be done concerning ICT facilities for care (via Erasmus MC and EUR/BMG – Health Policy and Management). There is a network of companies specialising on innovation in care (telematics, sensors, domotica). The Kennisalliantie, Syntens and B2SP play an active role in linking the involved partners.

Relation with the knowledge institutions
- Each of the four programmes has close ties with the knowledge institutions.

- Via the municipality, subsidies to Erasmus MC Biomedical Fund (knowledge and valorisation) Incubator (Erasmus MC Holding BV) are geared towards entrepreneurship. The municipality supports the Erasmus MC lobby for a KNAW (Royal Dutch Academy of Sciences) institute, Neutral Technology/Cardio-Vascular Diseases
- The parties in the consultation are mostly care providers, companies and care insurers. The involvement of educational institutions could be stronger, given the-quantitative-qualitative mismatch of supply and demand. This concerns (a) competences and (b) the number of care providers (currently 1 out of 10 people in Rotterdam's working population; the forecast is that this should be 4 out of 10.)
- Further, it would be desirable to have a different effort and training structure to tie in with care needs; among others, this would require a curriculum for a new training programme, Care and ICT.
- There are plans for attracting and retaining higher-educated staff/fellows (Erasmus MC and Rotterdam Life - formerly Rotterdam Student City).
- There are efforts to find spin-offs from other sectors, relative to the medical cluster. TU has been mentioned in this regard. There are also expectations about higher professional education and the creative sector. Rotterdam University (senior lectureships in Transitions in Care, Cohesion in Geriatric Care – with the Laurens Care Foundation – and Technology for Care) and Erasmus MC are involved in developing innovation concepts.

'Creative' Industry Development

This cluster constitutes one of three spearheads in the municipal policy of Rotterdam. The aims are:

a) Creation of new jobs in the 'creative' economy;
b) Stimulation of connections and crossovers between subsectors of the 'creative' industry and other sectors;
c) Improvement of Rotterdam's image as a 'creative' city.

The aim here is to contribute to a good business-location climate for 'creative' and 'knowledge' workers. On the one hand, there are expectations concerning the creative industry in terms of added value. This includes 'making the economy more creative: innovation, productivity, design. The creative sector is seen as an economic booster. Conversely, there is a perception that the creative industry is vulnerable and susceptible to the trade cycle. There are four supporting measures: (a) facilitating 'creative' enterprises, (b) networking with a view towards crossovers, (c) visualising and working on creating Rotterdam's image and (d) focusing attention on innovative milieus and talent development.

Relation with the knowledge institutions

- There is a triangular structure of government, business and education, called the 'knowledge triangle'. There is structural exchange of information and knowledge, including the Creative City consultative mechanism.
- There are studies concerning the transfer and departure of graduates with creative study programmes.
- There is an approach to dealing with crossovers within the creative industry and with other sectors (ICT, new media). Rotterdam University is organising a 'pressure cooker' geared towards innovation in the care sector.
- Utilisation of knowledge is indispensable regarding spearheads such as architecture, design and new media. There are partnerships with Rotterdam University, EUR (Erasmus University Rotterdam), Delft University of Technology and TNO (Netherlands Organisation for Applied Scientific Research). Rotterdam has a well-organised architectural sector.
- For design there is the Rotterdam Design Platform, with mention of its partnership with Rotterdam University, with the establishment of the Master's in Product Development. For the media sector there is the Rotterdam Media Commission, including film and audiovisual media.

- The knowledge and educational institutions involved in the cluster have good exposure. They also have an interest because of practical assignments, development opportunities and the labour market. If there is talk about the vulnerability of the cluster, the same would apply to the training programmes concerned.

The Rotterdam region constitutes one engine of the Dutch economy. Given the demographic developments, the contributions made by institutions in the context of their educational tasks, i.e. increasing participation of the immigrant community in education is extremely important. This is also seen partly as a social task. Immigrant participation in Rotterdam -- 24 to 28 % is the highest in the Netherlands. This requires special attention in supporting and shaping the educational task. In this regard, the institutions work together in developing expertise and cooperation in supplying educational services.

A recent study by SEOR (a private limited company of the Economics Faculty of EUR) showed the amount of talent leaks in Rotterdam education, along with the cost of losing this talent. RISBO (a private limited company of the Social Faculty of EUR) has conducted various studies into the study achievements of immigrant students in higher education. Clearly, the influx in higher education is increasingly diverse, but the study achievements of immigrant students continue to lag behind. Immigrant students stop their studies more frequently; and they take longer to complete them. We are seeing a gradual improvement in study achievements among female immigrant students. In the Rotterdam Delta Plan for education, the Rotterdam universities of applied science are working together with secondary education to improve transfer and study achievements. Additionally, the OCW (Dutch department of Education, Culture and Science) will support initiatives in this field in the coming years (with the help of so-called G5 resources). Given the diverse composition of its population, Rotterdam stands to reap many benefits. The potential for transfers to higher education is high.

6.1.3 Regional involvement

In terms of benefit and relevance, the link between strategy and implementation capacity is important for regional innovation and economic development. Regional cooperation is embedded in the mission and policies of all educational institutions that wish to contribute to the development of society. Below are several citations from the visions and missions of knowledge institutions:

Erasmus University: ‘At an academic level, internationally and regionally, we grow talent and produce knowledge for people, business and society’.

The INHolland University which is close to students, the market and society, specifically anticipates the demand for borderless higher education and applied knowledge.

Rotterdam University aspires to be a practically-orientated knowledge institution at the heart of Rotterdam – an institute that would have ties at many different levels to the city of Rotterdam and the region.

Delft University of Technology is convinced that building a strong global position is only possible if there is a strong regional ecosystem.

Rotterdam has broad research, knowledge and educational potential, which will be deployed in various economic and social trajectories. These are more or less linked to the three clusters, geared towards specific intrinsic themes such as quality of life, residential living, work and study.

A good example is the *Pact op Zuid* (Rotterdam South Pact). Here, regional/local policy is converted into concrete projects such as additional *Brede Scholen* (broad-based (combined) Schools), *Pot met goud op Zuid* (Rotterdam South Pot of Gold) and the approach to the Dordtselaan. The knowledge institutions work together in this with the municipality and other institutions. Several examples of this are the following knowledge centres: broad-based schools, the SCQ project (self-concept questionnaire) offices or work-study companies and incentive programmes such as the Dordtselaan Students' Quarter, Care Boulevard South, Stadium Park, Enterprise House South, Youth Norm South, the Pilot Project Social Work Placement, New Trade Lab, etc.

Regional involvement results in solving actual problems; the teamwork helps to ensure a win-win situation, where learning and regional development go hand in hand. The complaint that the organisation of the educational institutions lacks transparency for entrepreneurs and SME in particular, is not experienced as such in the Rotterdam region. The educational institutions have established specific tasks, functions and organisations to flesh-out regional involvement. Websites of the institutions are structured this way, although improvements can certainly be made. The projects have designed their own communication/media. With themes such as learning, residential living, working and living, they have broad social support.

6.1.4 Demand-driven cooperation

Knowledge valorisation and entrepreneurship must meet targeted and concrete demands. An essential function of regional cooperation is the identification of demand and its conversion to policy and action. The aforementioned clusters and themes channel demand, introducing focus and dialogue in the region.

The institutions want to refer to the strategic policy of the region in their own policy documents and plans. They are aware of the challenges and focus that exist. When writing this review, the recently developed cluster structure with the selection of 3 prominent clusters were not yet recognizable in the policy of most institutions. This refers more to fragmentation in activities than to a clear framework in the three clusters. Policy of Rotterdam University seems quite tailored to the local situation and needs, as can be read in the box below.

Rotterdam University, a UAS in Rotterdam

Rotterdam University is expressly embedded in the region. The UAS chooses to be a HEI from the region and serving the region. It positions itself with 2 key words:

- **Rotterdam**: The UAS focuses on societal themes and demands from the region and on those topics where it can play a significant role in particular. Rotterdam asks for a diversity of educational programmes, tailored to the regional needs. The city and student population is quite diverse as well. The UAS makes sure that the offered education fits the individual students' needs in order to make use of all talent and potential young citizens possess.
- **From Rotterdam**: Rotterdam University employs a certain style in its operations: innovative, pragmatic, result orientated, interdisciplinary cooperation and involved in society. It aims to contribute to the questions that the environment in which it operates might have. This awareness of developments in society is also transferred to students who hopefully apply it in their professional career.

This positioning is quite unique. The key concepts are leading in vision, policy, daily practice (education and research) and structure of Rotterdam University.

Translation to education

A well-organized education system stimulates students to optimally make use of their talents and 'exceed yourself' as is the motto of Rotterdam University. The institution wants to train students into competent professionals who are able to contribute to innovative approaches for topics at hand. This 'Rotterdam approach' is best learned through real life experiences. That is why all education programmes spend at least 40% of their time working on projects and internships (including thesis writing) in which cases from professional life are put central. During the first year of study, this is mainly covered by projects and guest lectures. Further on in their studies, students are encouraged to participate in projects with external clients, who also take part in the assessment of achieved results. The outcome of the project (approach, product etc.) becomes property of the client, which guarantees a result-oriented way of working by the students during the project. Rotterdam University indicates this two-party knowledge transfer as OIIO (Outside In, Inside Out). To this end, the UAS has come to an understanding with 70 influential companies and institutions in the region.

The offer of electives, minors and the innovation labs is clustered around the societal needs in the region, like; (1) Sustainability, environment, energy and water, (2) Accessibility, mobility and logistics, (3) Innovation in health care concepts and (4) Optimal talent development in the education system. This imbedded regional approach enables the system to adapt to shifts in regional focus in a flexible manner. To keep programmes up to date, knowledge from practice is constantly entered into the lessons and projects. Senior lectureships play a central role in this.

Translation to organization
The senior lectureships are organized and embedded within the eleven institutes of Rotterdam University. This enables them to offer a full service concept to the professional development of the concerned business sector in Rotterdam and strengthens linkages between business and education. In order to maintain professional linkages with this business community, all eleven institutes have an External Affairs department. Account managers link demand and supply side, they organize the work carried out by students and guest lecturers.
This is how Rotterdam University links professional life to education and research, this is how students learn the 'Rotterdam approach' of working on projects that matter for this region and elsewhere in the world.

A good example of a detailed knowledge-valorisation plan is that of TU Delft. Besides research and education, valorisation is TU's third official core activity. TU is of the opinion that the university will increasingly be judged by its ability to make a clearly recognisable contribution to the economy and society. At the same time, institutes and individual scientists will be openly ranked according to their international scientific excellence. TU does not consider this a contradiction. The expectation is that both direct and indirect funding will depend more on performance and reputation in the fields of science and valorisation.

Knowledge valorisation is a means of attracting more research funds, thereby strengthening research; the university becomes an interesting partner for other knowledge institutions, companies and governments and more appealing to students and staff.

With respect to knowledge valorisation until 2010, TU has formulated three target values, compared to the situation in 2003:
- Increasing private funding by 20% from €98 million per year in 2006 to €130 million in 2010.
- Aiming at commercialisation: 20 commercialised patents per year
- Increasing the number of spin-off companies by 25% to 40 per year, starting in 2010.
- In addition, TU Delft has formulated several additional objectives, such as aiming to be more accessible for SME, for example. Encouraging and implementing a regional

programme to enable 20 companies to achieve a turnover of €20 million (the 20 x 20 programme).

Knowledge valorisation should contribute to strengthening the economy and ties with society. The key elements are:

- Support for postgraduate and academic staff in starting their own companies, based on knowledge from TU Delft
- Commercialisation of patents, for example, in the form of license agreements with companies
- Development of preferred partnerships with industry and government, including the Rotterdam Port Authority
- Development of Technopolis
- Implementation of research programmes financed from public-private partnerships
- Facility-sharing with companies
- In-company training programmes for companies and government authorities
- Making TU Delft accessible to SME

The faculties (along with the embedded Delft Research Centres (DRCs) jointly realise the valorisation aims of TU Delft. However, centralised coordination, particularly stimulation and support, will be necessary to raise knowledge valorisation to a higher, institution-wide level. The Valorisation Centre was established for this purpose in 2004.

The process of regional cooperation will deal with the following elements:

1. Identification of demand (from concrete problems, concrete demand or visions)
2. Definition of cooperation
3. Arrangement of programming
4. Implementation of programmes / projects
5. Evaluation and feed back

6.1.5 Identifying demand

Rotterdam has several mechanisms for identifying and discussing demand and/or potential improvement.

a) Initiatives from the environs and clusters

The sequence of initiatives from the (public) domains:

- National Government: Metropolitan cities (G5) immigrant policy, among others
- Provincial/regional Authorities: Peaks in the Delta
- Local (semi) Government: Economic Exploration (OBR), Chamber of Commerce
- Partner (public) institutions: EDBR (Economic Development Board Rotterdam), Knowledge Alliance
- Education institution: local/regional policy, research senior lectureships and university research.
- Business: Business associations, interest groups, individual businesses.

With regard to the three clusters, although the initiative comes chiefly from the local authorities, there is also a significant degree of cooperation with the knowledge institutions in formulating campaigns and programmes.

Herein we also find the following distribution of subthemes:

Event driven:
This is mainly geared towards exposure. Examples:
Rotterdam European Youth Capital 2009, Rotterdam Entrepreneurship Week 2009, Cultural Capital 2001, Sport City 2005, Your World, Rotterdam, Cultural Capital, Port Days, Recruitment Days.

Anticipating problems:
This is mainly geared towards operational issues. Examples include the focus on municipal services, including youth, education and society (JOS service), care and welfare, labour, enterprise, leisure and transport or, seen from the vantage point of Rotterdam's economy: active employment mediation, extra attention for education and training, boosting Rotterdam's Economy, backing up the building trades, accelerating investment in infrastructure and own property, prevention of poverty and indebtedness problems (source: Municipality of Rotterdam website and OBR – Rotterdam Development Company).

Research and Development:
This is mainly aimed at (infra) structural issues. Examples:
Municipality: Working on the city centre, Opportunities in Rotterdam south, Creative Industry, Rotterdam Energy, Rotterdam Climate Initiative.
Province (South Wing): Glasshouse Horticulture (Green Ports), Port & Industrial Complex, Order, Law & Safety, Health & Life Sciences

It seems that sufficient advantage is being taken here of the broad offer of knowledge circles and research programmes of the educational institutions.

Initiatives from knowledge institutions

All four knowledge institutions have established organisational components and functions to maintain and manage relations with companies and institutions.

TU's approach was outlined above. The Institutional Development Office of EUR focuses on achieving the aims of the strategic plan, including the objectives geared towards strengthening relations with the surrounding area. The Office of External Relations at the Rotterdam University operates per sector and centrally. Its external relations' account managers were hired for each occupational sector (health, education, engineering, commercial services and the social sector). There are customer relations managers for each specific sector (accountancy, property and estate agencies, social work, etc.). At INHolland University, supply and demand are mainly channelled through the Enterprise Service Centre, staff of external relations and work placement-graduate coordinators. In addition, as at Rotterdam University, study (-work) companies, knowledge circles and informal business relation networks, supply and demand are interlinked.

b) Formal and informal mechanisms
In contrast with the research universities the UAS have at the level of their separate programmes the formal institution of boards of reference, consisting of representatives of the profession and regional business. These boards have the function of advise and feedback about the contents and the academic and professional level of the curriculum.

The knowledge institutions meet one or more times annually, separately but also jointly, with the province and the municipality. In this way, the Board of Governors of EUR confer with the Rotterdam Municipal Executive at least once a year. This consultation enables the parties to align their mutual requirements. Alignment consultation also takes place with the province of *Zuid-Holland*. This is done together with TU Delft, the University of Leiden and TNO, approximately twice a year. Further, the chair of the Board of Governors of EUR is on the Economic Development Board Rotterdam (EDBR). The universities of applied science have

similar constructions. The institutions participate structurally in regional consultations / bodies / links of (knowledge) alliances with strategic partners in the region, previously referred to in the (public) domains.

During events, besides regular consultation, there are informal mechanisms and personal meetings between administrators of higher education institutions, municipal/provincial administrators, representatives of executive staff organisations, semi-government agencies, art and cultural organisations and companies. The design of the education models and open organisation of the institutions provide links to the surrounding area as a matter of course.

Subsidy schemes are major boosters of cooperation, which make intensification of regional cooperation desirable. The G5 budget, for example, has intensified approaches to immigrants and the RAAK (PRO) subsidies, knowledge development and valorisation with SME. Compared to the problems of large infrastructural projects, alignment between training, research facilities and the market for SME is less well organised. The question here is also quite diverse and lacking structure.

6.1.6 Designing Cooperation

In the Rotterdam region there are many initiatives and alliances that receive some exposure. Although large infrastructural projects can be seen everywhere, the knowledge institutions are not always recognisable. The many, smaller alliances (work placement, completion of studies, research, small projects and the like) are less well known regionally. The exposure and own profile, however, is a significant feature when defining cooperation.

Among others, the intensity of cooperation depends on:

- The extent to which it fits an institution's policies
- The extent to which expose is opportunity driven
- The funding structure
- The relations and efforts of the participants (personal and institutional)
- The duration and continuity of cooperation (SME often focused on short-term cooperation)
- The interests of the participants herein
- The nature (policy-related, operational, practical experience, research, etc.)

The following types of alliances and mechanisms are noticeable in the Rotterdam region:

1. **Voluntary agreements** (JOS agreement, The Rotterdam Agreement, etc.)
   These are concluded between Institutions/Training Centres at UAS or between faculties and EUR and third parties. They mainly focus on strategic alliances and conversion to operational impact.

2. **University chairs, senior lectureships, knowledge centres** (metropolitan issues with the Faculty of Social Sciences, sociology capacity group, INHOLLAND dynamic of the city, Rotterdam University senior lectureships for metropolitan issues in the port, etc. For example, this concerns research into the metropolitan situation in Rotterdam. University chairs could be positioned with social institutions in Rotterdam (such as the *GGD* - Municipal Mental Health Service) and the IJS (individualised junior general secondary education). In particular, such chairs have been set up in the Erasmus MC. The mechanism is primarily geared towards development of new knowledge and support of operational problems.

3. **Holding and operating companies**
   Holding and operating companies are established to valorise knowledge. They stimulate enterprise, support and create spin-offs, offer credit facilities, develop

academic workplaces and enlarge the contract portfolio. They are mainly aimed at valorising knowledge and commercialising activities.

4. **Matching agencies and customer relations managers**
   Here, supply and demand is linked, varying from work placement and thesis subjects, teaching apprenticeships to training tailored for companies. This is primarily geared towards matching smaller parties with operational capacity. Additionally, multiple-year agreements are initiated, concluded and maintained with (large) companies and municipal services. Cooperation among institutions and cooperation between institutions and companies is comparatively limited.

5. Provision of procedures for **'Erkenning van verworven competenties'** (EVC, acknowledgement of obtained competences) by assessment centres within HRE. EVC is an instrument targeted at specific (continuing) education for employees of companies.

6. **Foundations** (e.g. Area010, Rotterdam South Pot of Gold)
   Foundations have been established for incubators and social projects, for example, in which participants from institutions and training centres often hold management positions. Although they have direct links with education, they have their own responsibilities, visions and strategies. This focuses mainly on embedding knowledge and training programmes in social projects.

7. **Chain cooperation**
   In certain chains (e.g. care or medical chains, creative industry, education (primary education, (preparatory) SVE (senior secondary vocational education), HPE (higher professional secondary education), UE (university education) in the same sector there is close cooperation in promoting contacts in the chain. In a certain sense, these professional groups are related. Although several initiatives have been launched at (preparatory) SVE and HPE, there is still a considerable disparity between university education and higher professional secondary education.

Related to this, the business circles and knowledge institutions intend, with the strong support of the municipality, to apply for funds from the national government and the EU to operate on an international level.

It is important here to find a win-win situation for the parties, with clear communication of expectations and interests. Various mechanisms, for example voluntary agreements and senior lectureships, could be combined, but they are often independent as such. Senior lectureships and university chairs, which seem to provide a connecting link among the various mechanisms, play important roles in the creation, circulation and valorisation of knowledge.

The intensity of cooperation could vary according to integration of activities. These themes and common interests, which have been laid down for the longer term, are clear here.

Examples of intensive cooperation:
Erasmus University, Woudestein location, Erasmus MC, Hoboken location, and the *GGD* (Area Health Authority). These involve exchanges of knowledge in the following fields: Economics of health care, the elderly population, supervision and compliance, social innovation, prospective population epidemiological research, generation R. Both the outcome of fundamental scientific research and the social significance of the research are important in this teamwork effort.

INHolland University has intensive, broad teamwork in the Rotterdam South Pact (Rotterdam South Pot of Gold and the Jonge Noorden op Zuid project office). INHolland University,

which works in this with social institutions, the municipality, primary and secondary education, plays a key role in the development of social work placement. It contributes to the development of districts, transfer in the education chain and competences of higher professional education students.

Rotterdam University
The programme and senior lectureship, Ideal Port, combines and facilitates the common educational objectives of the Port Authority and university in practice, ultimately intended via experiments to make (small-scale) test and research results applicable to the port. The senior lectureship does this in cooperation with national and international expertise centres and research institutes, with which (in collaboration with ACTP – the Academic Centre TransPort) it enters into partnerships. The senior lectureship also stimulates the creative input of students, pointing them towards new, unorthodox, future-orientated solutions ('extreme solutions') – an essential stepping-stone en route to the ideal port. The senior lectureship generates, stimulates, collects and circulates knowledge in the area of ports, port authorities and industry.

Delft University of Technology: fleshing out cooperation with the Port Authority/glasshouse horticulture

Those concerned encounter a diversity of interests, connections, people and organisational cultures. In cross-border cooperation it is important to align the personal aspirations and skills, with specific attention for teamwork.

6.1.7 Design of programming and implementation

A clear definition of cooperation simplifies the step to design and implementation. In this way, expressions of expectations, goals and intentions are in place. This is a major step in designing the project. This paragraph specifically discusses several aspects of regional cooperation.

Budgets
A key success factor in designing programmes is the availability of funds (via subsidies, institutional budgets and commercial revenues), along with their continuity. Subsidy schemes have considerable attraction for driving initiatives (incubators, research, training, specific policy on sustainability, the study success of immigrant students etc. However, continuity is not always guaranteed; or there are insufficient funds to continue without subsidies. One problem that is on the rise is co-financing as a condition. There are limits to the possibilities of institutions for continually complying with co-financing requirements. Encouraging entrepreneurship within the initiatives is therefore recommended. To a degree, it can also be found in various organisations, for example, in study-work companies, paid research assignments, paid (postgraduate) apprenticeships, commercial agreements between companies/institutions and knowledge institutes.

Among others, funding is made available by the previously mentioned (public) domains. Mediation takes place through:
- RAAK (subsidies)
- Senter Novem (innovation vouchers)
- SKO (special foundation for funding UAS)
- Subsidy desks within knowledge institutions
- Innovation Vouchers SME.The application of these vouchers mainly concerns the services of the Netherlands Organisation for Applied Scientific Research.

Planning/staff establishment
Another possible factor is the (temporary) availability of capacity. Project planning does not always run parallel with teaching periods. The planning horizon is often limited, requiring multiple-year plans. Staff of knowledge institutions often face competing task assignments, usually with divergent financial consequences (education, research, social service provision, sometimes patient care as well). Personnel staff establishment of institutions is limited. By comparison, 2.3 % of Rotterdam's working population works at knowledge institutions. The institutions have limited staff pools that can be deployed flexibly. To a large extent, students will also carry out projects under supervision.

Communication
Communication of aims, work procedures and results is important in regional cooperation. The separate institutions have made current expertise, skills, experience and research tasks transparent via their websites, www.eur.nl, www.inholland.nl and www.hogeschool-rotterdam.nl (and the senior lectureships' own websites, www.obr.nl).

In addition, there are 'compilation´ sites such as www.lectoren.nl, www.kennisalliantie.nl and www.sko-HPE.nl, www.HPEkennisbank.nl, where information about areas of expertise, programmes and results are collected.

With regard to innovative initiatives for knowledge construction, knowledge institutions take part in initiatives geared towards the main themes in Rotterdam, such as the Rotterdam Climate Campus and the Rotterdam South Pact. These projects have their own websites. The aforementioned collaborative mechanism either organise their own exposure or are recognisable features, for example, of an institution's website. They are primarily designed to inform stakeholders. In some cases, they also offer asynchronous interaction (forum) or download facilities. In many cases, beyond mentioning stakeholder or organising institutions, there are no links to the institutions themselves. There is little or no online interaction in the alliances (discussion, sharing of experiences, communication, etc.), with little or no use made of online collaborative tools.

The institutions have communication material geared specifically towards companies. The websites contain – besides the factsheets - separate sections for companies and institutions describing opportunities for working together, brochures with in-depth information and films showing best practices and special company days.

ICT infrastructure plays an important part in the development of clusters. This can be seen mainly in the medical-care cluster and in the creative industry. It is less evident in the port and industrial complex.

Human Resources / implementation programmes / projects
Gaining practical experience and practice-orientated research are important features of regional cooperation. Senior lectureships, work-study companies and knowledge centres are also key elements in knowledge creation and valorisation, in which learning, research and case studies are closely linked.

Facilities
Consultations between the three institutions in Rotterdam (EUR, UAS) take place about a new, comprehensive administrative agreement about cooperation of services and use of facilities for education, students and the like.

Tentative:
- Cooperation between Erasmus MC and TU research infrastructure
- Use of Rotterdam University's ICT facility in the area of media technology

6.1.8 Evaluation and feed back

Evaluation and feedback from projects takes place in the project plans (annual reports of foundations, Rotterdam South Pact's quarterly reports, project reports relating to subsidies, etc.). There is little Meta-level information. However, this OECD (Organisation for Cooperation and Development) review does contribute to evaluations at Meta level.

Concrete goals and tasks have been defined for major themes (problems and long-term development). The knowledge institutions contribute to this via the formal and informal mechanisms.

There is no clear control function in which monitoring of progress is recorded. Also, there is often no effect measurement; and the learning function could be expanded.

One type of good cooperation and feedback can be found in the Rotterdam Desk of the Faculty of Social Sciences, in which the municipality and university jointly take care of clarifying and then researching questions. As a result of the municipality's reorganisation of research with research coordinators at each department, demand for knowledge is becoming increasingly clear.

There are various mechanisms in which learning points are converted from practical experience into study programmes and organisation.

- Adaptation of the curriculum in cooperation with the professional field.
- TU Delft's approach to knowledge valorisation through in-company training
- Research by senior lectureships into the effectiveness of projects (e.g. senior lectureship dynamic of the city and research in the care sector)
- Adaptation from or development of the curriculum from learning points gained in projects.
- The various formal and informal consultative structures (knowledge alliances, EDBR etc.)

6.1.9 General conclusions

- The organisational degree of the clusters is good, partly because of the efforts of the municipal services. At cluster level there is well-structured consultation with the knowledge institutions. Much attention is given to knowledge valorisation.
- The knowledge infrastructure -- education and research – has good exposure in all sectors; and there seem to be relatively few gaps in the knowledge on offer (only the medical and care cluster is the most explicit in signalling a split between supply and demand, both qualitatively and quantitatively).
- There is interaction. The clusters are investing in the knowledge institutions' educational and R&D programmes, including chairs and senior lectureships. There are lobbies for obtaining funds for the knowledge institutions.)
- At all four, entrepreneurship form part of the institution's profile. Entrepreneurial training has been stimulated by the recent agreement with Rotterdam.

Problem areas:

- The curriculum and research is still too discipline orientated. In the medical/care cluster in particular, there is an inherent lack of contributions from study programmes other than primary medicine and care sectors. Too little attention is given to crossovers.
- HPE and UE are still operating at cross-purposes: there is still too little complementary work, utilising each other's strong points.

- University research is still not driven by demand enough, instead, it is strongly determined by academic committees, as at EUR.
- There is insufficient common alignment and profiling of the knowledge institutions. Although knowledge valorisation is a strong point in the institutional policies of TU and Erasmus MC, it is limited within the other faculties of EUR.
- Remarkably, there is no collaboration between the HPE and UE in the area of entrepreneurial education.
- A higher contribution and impact is expected than what the combined organisations are capable of delivering. It looks a bit like capacity juggling.
- Furthermore, there are general regional characteristics that also restrict the possibilities of knowledge institutions, giving them an unappealing image and poor business climate for those with higher educational qualifications. Companies have to go to great lengths to retain qualified staff.
- With the exception of various sectors, many SME are not innovative enough.

6.1.10 SWOT

SWOT shows a number of development directions and opportunities that enhance regional cooperation. The Knowledge Alliance Study (Oct. 2007) concluded that important factors such as talent, entrepreneurship and organising capacity of combined innovation had failed in the region of *Zuid-Holland*. The emerging convergence of the regional agenda (including the Rotterdam South Pact, the Rotterdam Climate Initiative, Rotterdam Student City and Generation R), diversity and many small collaborative ties, for example, are now seen as strong points. The percentage of trained specialists in the Rotterdam region has also increased, making talent more widely available as a major factor in regional development. The current number of knowledge institutions is sufficient. Mutual alignment takes place in various ways (e.g. the Rotterdam Higher Education Consultation, the Economic Development Board Rotterdam and field-of-activity committees). In recent years, the strengthening of the research and development activities of universities and senior lectureships of universities of applied science has also had increased impact at local and regional levels. Entrepreneurship, which is strongly anchored in the visions of the knowledge institutions, is also adapted to the local agenda and current economic situation (for example, the Rotterdam Agreement). With a strong tradition of cooperation and the strong 'brands' of universities in the world and of universities of applied science in the region, the institutions are increasingly better able to enlarge their impact on the themes that are important to Rotterdam – port and industry, creative industry, care and welfare, education and sustainability.

Strengths	Weaknesses
➢ Long tradition of cooperation; ➢ Strong 'brands' of universities in the world; ➢ Many small alliances; ➢ Good, successful collaborative ties that can serve as examples; ➢ Emerging convergence of the regional agenda (more focus on spearheads); ➢ Sufficient number of knowledge institutions present; ➢ Young population; ➢ Diversity.	➢ Residential and living climate; ➢ Relatively low drive to excel; ➢ Many people with low incomes; ➢ Limited cooperation among institutions and between knowledge institutions and companies; has not grown historically; ➢ Disparity between HPE and UE is large; ➢ Focus on spearheads is ambiguous; no clear direction; ➢ Systematic research into demand for knowledge is weak; ➢ Science does not perceive surplus value in cooperation with business.
Opportunities	**Threats**
➢ Link theory and practice; ➢ Economic concentration of business; ➢ National focus on innovation in education; ➢ Substantive cooperation on themes resulting from the economic crisis (utilise 'sense of urgency'); ➢ Mention Rotterdam's strength: carrying out successful projects; ➢ Position the Rotterdam region internationally as a sustainable region; ➢ Attract people with higher education; ➢ Diversity (cultural, but also economic) as the strength and basis for innovation.	➢ Autonomous actions by faculties of knowledge institutions and manageability of knowledge institutions in general; ➢ Preparedness of multidisciplinary research limited; ➢ Expectation that each educational institution will participate in the problems of the region; ➢ Huge diversity in the region; ➢ Rising national political influence; weak regional response; ➢ Thinking grand thoughts without paying attention to the practical side; ➢ Intake of highly-trained specialists; ➢ Lack of decisiveness, direction, focus; ➢ Regional cooperation remains a patchwork process.

6.1.11 Recommendations

a) Cooperation higher professional secondary education (HPE) -university education (UE)

The following proposals are designed to close the gap signalled in cooperation between HPE and UE and to make more use of the great potential that exists:

- Accelerated elaboration of the agreement for administrative collaboration in the framework of the Rotterdam Higher Education Consultation. This refers to the preconditions for collaboration.
- Make a joint portfolio analysis at Bachelor's and Master's levels and the advanced programme field. What overlaps and gaps are there, from the perspective of the three clusters? Which combinations of HPE and UE collaboration are possible?
- Explore the possibilities of cooperation between UE and HPE Bachelor's degrees in graduation projects in the framework of the themes of the three clusters. Also improve transfer arrangements from HPE Bachelor's to UE Master's programmes via, for example, transfer of minors from the HPE. Currently, access to countless Master's programmes at EUR is laborious because of huge demand. This results in rigid selection procedures, as at the Rotterdam School of Management. Agreements about joint transfers do not get off the ground, with the exception of the Faculty of Economics (and, with limitations, at Law)
- Set the HPE Master's up in cooperation with EUR (cf. teacher training for primary education). One option could be to develop Master's programmes selectively for HPE Bachelor's programmes that fit main regional points such as creative industry, medical and care. Examine whether joint degrees would be possible with HPE-UE combinations.
- Make agreements for transfer from UE Bachelor's HPE. There is a large number of university students for whom studying in higher professional education could be a better choice, as these students are less interested in the theoretical and academic aspects. Ensure that there is information about the change to HPE and establish networks of student counsellors. In accordance with TU Delft's model, develop a Studying as a Young Progress approach, whereby the change to the HPE is seen as a sensible choice compared to endless muddling on in university education.
- Research. The proposal to do doctorate research by setting up a tripartite model with a UE promoter, an HPE researcher (supported by a lecturer) and thirdly, a social institution / company or sector involved in the problem or providing research material.
- Cooperation on the themes of culture, enterprise, diversity; organise theme weeks, training and summer schools.
- HPE model: team apprenticeships in which HPE and SVE work together in projects, along with HPE and UE students. Remembering the past: restart the academic shops in which UE and HPE students work together.
- Academic knowledge is supposed to be specialist knowledge. This impedes potentially the match with business demands and valorisation of knowledge. As HRE is better equipped to operate regionally in knowledge transfer/exchange, the question arises if focused cooperation between university and HRE (senior lectureships etc.), HRE could contribute to this practical implementation of specialist knowledge in the region.

b) Cooperating with municipal services:

To combine attention and energy effectively, creating more interaction, the following proposals for cooperating with the municipal services will be made:

- Link drivers of the clusters to drivers within the knowledge institutions and assign points in which the knowledge institutions want to excel (e.g. innovation in care, port logistics, education, diversity, communication, design, etc.). This could also help reduce any competitive problems among the institutions.
- Create specific moments/events around clusters and themes. Characterise Rotterdam as a knowledge city. Link this to innovation (awards), business contact networks, knowledge creation, development of visions and training programmes.
- Facilitate these events with (Internet) communities in which relations can be established and knowledge shared.
- Organise a supply-demand match: (online) sign-up lists for projects, Internet supply-demand bank for research and development, knowledge markets, network events and the like,
- Define specific objectives in the area of regional cooperation, innovation, knowledge creation and valorisation and the connection between education and the labour market – and create a monitoring function for the objectives of clusters and the knowledge opportunities: projects and developments from the market.
- Create interfaces such as with the Rotterdam desk of the EUR Faculty of Social Sciences.
- Make regional cooperation part of the economic exploration.

c) Cooperation with other parties such as social institutions, business and care institutions

Cooperation is primarily networking. The following proposals are designed to foster cooperation with other parties such as social institutions, the business community and care institutions:

- Organise supply-demand matches: (online) sign-up lists for projects, Internet supply-demand database for research and development, knowledge markets, network events and the like,
- Put a face on cooperation, for example, with ambassadors, well-known personalities, the Internet etc. SME are quite fragmented and drivers around specific themes could help combine demand.
- Draw up an overview of stakeholder and business associations etc. and communicate what the municipality and knowledge institutions have to offer. Stimulate demand from the market in the existing communities. Establish links between market and knowledge communities (senior lectureships, university chairs)

7 CONCLUSIONS: MOVING BEYOND THE SELF-EVALUATION

7.1 Introduction

Regional cooperation between higher education institutes and their stakeholders is an important means to achieve societal, educational and economic targets. From the SWOT-analyses in this report it is clear that regional cooperation in the region of Rotterdam and Delft leaves room for improvement. At the moment regional cooperation is often fragmented and not well-structured, although in specific cases there are successful examples of regional cooperation.

From the SWOT analysis it is clear that incentives for regional cooperation seem to be missing. Funding mechanisms of the institutions involved are not targeted at enhancing cooperative structures at regional level. Aside from that, the regional market for higher education appears to be largely segmented and is characterised as complex. Moreover, stakeholders involved do not experience concrete incentives to cooperate with each other. What appears to be lacking is a common sense of urgency for action. Also a structure for sustainable partnerships is not available.

At the same time there appears to be willingness among the involved stakeholders to cooperate on a mutual shared interest in themes that have a specific importance for the region. Chapters 3, 4, 5 and 6 present various examples of this. Taking this willingness as given and needed (seeing the problems that the region is confronted with) there appears to be a serious need for a structure to initiate and coordinate regional cooperation.

7.2 Establishing regional cooperation

To establish regional cooperation various conditions and demands should be met. As input for further discussion we briefly outline the most important ones in this section.

- Organisation structure: lean and mean
- Clear objectives (SMART)
- Incentives for all stakeholders to be involved
- Create synergy between education suppliers
- Monitor and evaluate structure and objectives

Organisation structure

For establishing regional cooperation an organisation structure or platform is required in which all relevant regional stakeholders participate. There is currently not a steering committee that links the different initiatives, forms a platform for tripartite discussions on the strategic agenda and functions as a knowledge portal to businesses. The self-evaluation deals with the cooperation within the three clusters, the harbour industry

complex, the medical sector and care and the creative industries. These categories are too broad. A more narrow definition of sectors within the clusters is needed, especially in the harbour industry complex.

There should be an adequate infrastructure of services, education and knowledge. A broad package and intensive cooperation is an advantage for the region. This region can vary per sector (on local, regional, national or international level). When the theme is too broad, the risk exists that too little initiatives are being taken. Special attention should be paid to the SME since they play an important role in the economic life but in general are underrepresented in coordinating bodies concerning education and labour market.

The main task of this organisation will be to coordinate demand and supply of knowledge in the region of Rotterdam. To be of relevance for the development of the region the organisation will play a role in identifying knowledge needs, articulating knowledge demands, and find (combination of) partners to meet this demand with a supply of education, advice or research.

The precise organisation structure is yet to be defined. However, since the main task of the organisation is coordination, and not developing policies, programmes or projects, we think that the new organisation should be “lean and mean”, with a small staff, supervised by a board of tripartite stakeholders. If policies, programmes or projects are to be developed this will be full responsibility of the platform partners involved.

To avoid creating a new administrative machinery it appears logic to accommodate for the new structure within an existing organisation. In the workshop held a few suggestions were made or organisations presented oneself as host for new regional coordination platform. Regarding research the city council already has a sort of coordinating function. The municipality can give support by attaining national or international subsidies. There has to be a strong ‘Rotterdam’ story to build on. However, during the workshops critical remarks were expressed on this, especially lacking leadership and vision. Another organisation to fulfil the role is the Economic Development Board Rotterdam (EDBR) . The EDBR, as an intermediary between government, higher education institutions and business companies already has a coordinating function and already is established.

For a successful platform it is seen as important that the platform is lead led by a strong inspiring puller (project leader).

Setting objectives

Aside from a clear structure the new organisation/platform should have clear objectives avoiding the pitfall of becoming just ”one of those discussion groups”. For this reason we think it should be good to formulate a general objective (e.g. contributing to regional development), targeted by specific objectives (e.g. cooperation around themes) and followed by concrete activities (e.g. projects). These objectives and activities need to be backed up by a clear needs analysis of the regional problems, claiming and feeding into a sense of urgency among all stakeholders.

However, it should be clear and emphasized at the same time that these objectives are not in anyway determining the content of the activities to take place. Triggered by the general and specific objectives the partners and stakeholders are challenged to formulate their own projects or activities (bottom up approach).

Incentives for stakeholders

Closely related to the former condition it is required to create an incentive structure for partners and stakeholders to get involved and to feel committed. At the moment the

funding mechanisms for the HE sector are by no means enhancing cooperation between the HE institutions. Existing funding mechanisms at regional as well as national level should be carefully reconsidered and if possible partly be redirected towards funding regional partnerships. Also co-financing arrangements with third parties should be considered (e.g local governments and enterprises); *Generation R* has proven that relatively small financial incentives can be very successful in creating a high quality and long lasting instrument.
Aside from financial incentives also other incentives can be helpful in enhancing regional cooperation, e.g. exposure to the public, corporate social responsibility, attractiveness to new students et cetera.

Create synergy between education suppliers: setting the agenda
To a certain degree the HE institutions are now seeing each other as competitors on the market for students and research, whereas it is clear that to a large degree their education supply is complementary to one another. This should be exploited from a cooperative perspective. In particular this should be done around the themes that have come out of the SWOT-analyses. For the theme of regional innovation (chapter 3) the following topics were brought forward:

- The creation of a strategic innovation agenda;
- An impulse towards clustering and developing science parks;
- Enhancing the interaction between the triple helix partners;
- Fine-tuning education in relation to the present clusters;
- Facilitating and promoting (market-related) research;

Regarding the labour market (chapter 4) issues were mentioned like:

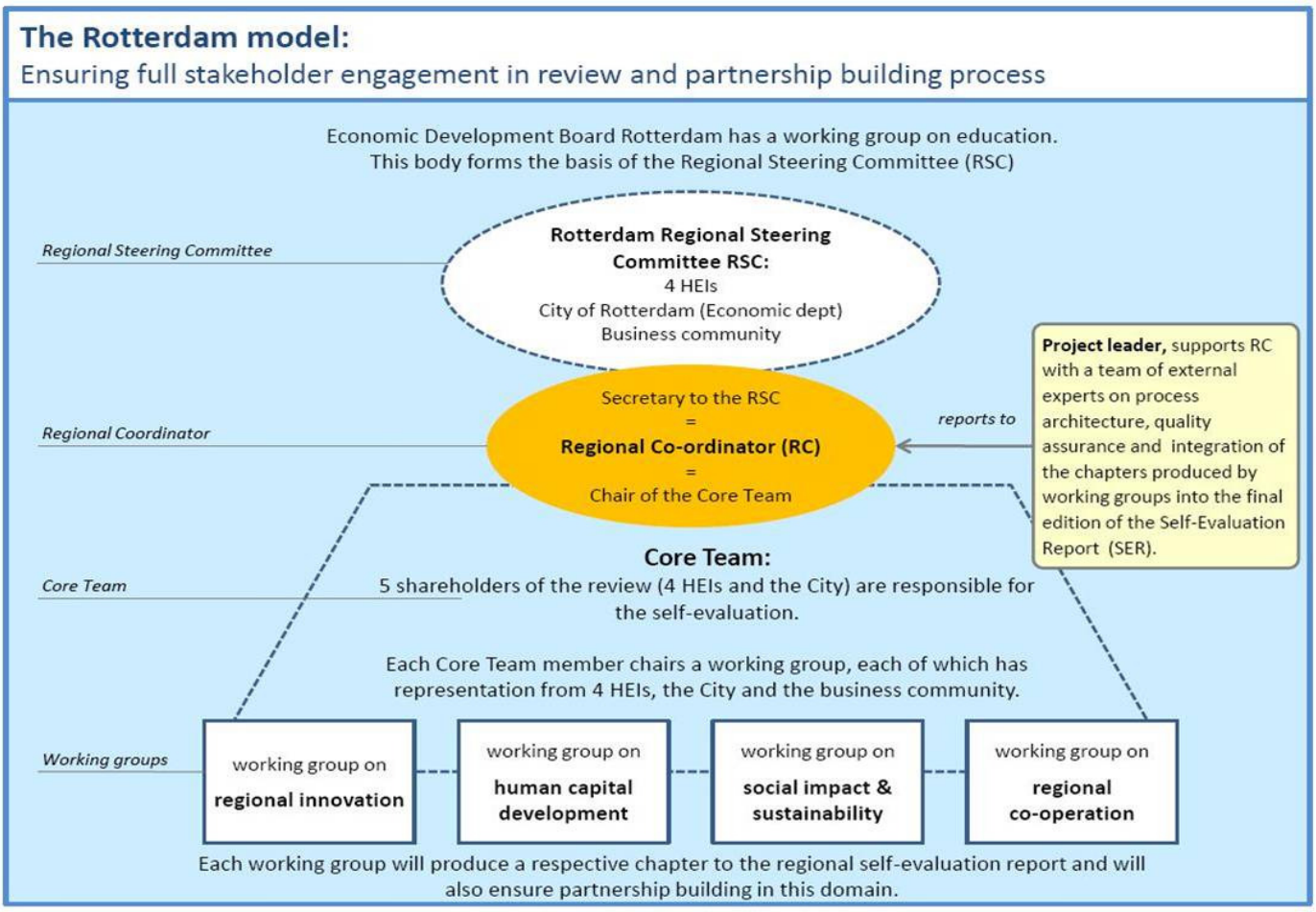
- Attracting and retaining students and graduates, e.g by an active alumni policy
- Attention for the development of highly talented youngsters from ethnic minorities
- Improving the role of HE in lifelong learning

Regarding social. cultural and environmental development (chapter 5) issues mentioned were:

- care, sustainability, diversity and creativity and generating (inter)national
- increasing (social and multicultural) entrepreneurship
- community formation;
- demand for multidisciplinary approach;

Monitor and evaluate structure and objectives
To assess the relevance and effectiveness of the new platform it is recommended to monitor and evaluate periodically and adjust structure and objectives where needed.

ANNEX 1 THE ROTTERDAM MODEL



ANNEX 2 VALORISATION AGENDA: SUMMARY

On 19 December 2007 the valorisation project started, commissioned by the Innovation Platform and the interdepartmental programme management Knowledge and Innovation. The primary goal of the project is to realize concrete agreements and actions.

The Netherlands strive to develop to an economy and society based on knowledge and creativity. Within this, knowledge valorisation has an important role to play.

Over the past few years knowledge institutions, companies and civil organisations have worked on knowledge valorisation. The government took initiatives to support valorisation. However, we do not always make the most out of our chances. As a whole, the economic en societal return on investments in public research and public-private cooperation is still insufficient.

In order to accomplish knowledge break-throughs and to implement them, it is of utmost importance to invest for a long term.

In addition, questions arise as to whether the innovation system in the Netherlands, which was formed in a period of linear and closed innovation, is still sufficient.

The most important reason why return on public and public-private investments in knowledge development is not optimal is that knowledge valorisation is not yet self-evident. This leads to insufficient attention for development of the processes and competences of valorisation. Over the past few years the ministries of Economic Affairs, of Education, Culture and Science and of Agriculture, Nature and Food quality, often in cooperation with other departments, have committed themselves to solve problems concerning valorisation by developing a set of policy instruments. However, valorisation is still insufficiently embedded at knowledge institutions, companies and civil society organisations.

Four important bottlenecks may be distinguished, which will be discussed below.

Bottleneck I: Insufficient cooperation and networking between stakeholders

- *Large gap between research and business/ civil society organisations*

  Companies, civil society organisations and knowledge institutions tend to cooperate more often then before. However, cooperation does not run smoothly, is scattered and demands a lot of effort from all parties involved.

Stakeholders regard each other as competitors. This implies that there is little incentive for others to 'do business' with their research outcomes, leading to low effectiveness and efficiency in cooperation and eventually leading to little development of innovation and new business within existing companies.

- *Limited expression of demand from SME and lack of connections.*
- *Lack of visible valorisation of alpha, gamma and beta research.* Insufficient attention for cross linkages between these knowledge areas (i.e. involvement of civil society organisations with knowledge development is very limited.

Bottleneck II: Fragmentised valorisation policy

- *No integrated approach and discontinuous valorisation policy from government.* Because an integral and long term approach is missing, valorisation instruments are fragmentised, which leads to split-up resources. Policy instruments are not well geared to one another. Bottlenecks, conditions and rules for subsidies differ per authority level and the length of receiving subsidies.
- *Lack of vision and insufficient direction at knowledge institutions and business.*

Bottleneck III: Insufficient organisational embeddedness with partners

- *Fragmented organisation and limited commitment at managerial level.* Responsibility for valorisation is not clearly defined between partners.
- *No structural linkage with financing regime for implementation of valorisation.*
- *Insufficient availability of venture capital for 'early stage' and 'proof of concept' projects.*

Bottleneck IV: Insufficient expertise

- Insufficient expertise of knowledge protection and exploitation processes;
- Insufficient stimulus for entrepreneurship and new business within knowledge institutions;
- Insufficient support for and ambition of young, starting companies for development and growth. When starting a company, people usually do not have enough access to supervision, networking, facilities and capital.

Possible solutions

The above mentions bottlenecks will be translated into critical success factors (CSF). Each CSF holds several sub-solutions.

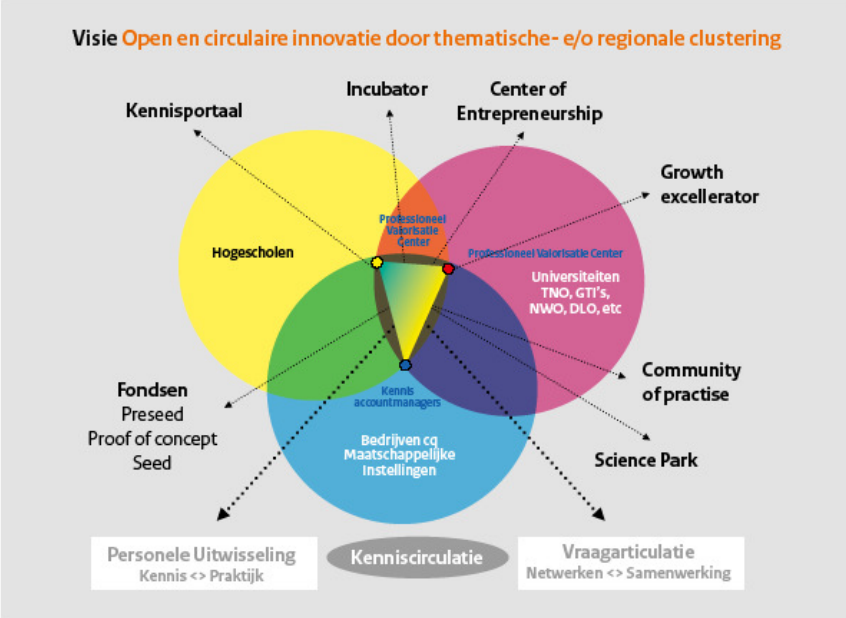
CSF I: Intensive cooperation between knowledge institutes, companies, civil society organisations and government

- Common vision with accompanying goals which should be made more concrete (content-wise) in the coming years;
- Partners provide input to the vision and goals from there own mission;
- Cooperation is made permanent by e.g. common, sustainable investment in 'best practices'.

CSF I: Consistent and coherent long term valorisation policy

- Role of government is especially geared towards facilitation of well-functioning basic infrastructure, creating financial incentives and communication.

Figuur 3: De basisfaciliteiten van valorisatie als stimulans voor kennis clustering en open innovatie.



- Build on well-functioning basic facilities for knowledge valorisation.
- Develop a transparent and consistent set of government instruments.
- Promote direction by demand and involvement by public-private cooperation.
- Implementation of policy instruments should be carried out by an existing government organisation.
- Establish a commission for valorisation with representatives from all parties.

CSF III: Structural embeddedness

- Increase commitment at managerial level at knowledge institutions and companies for valorisation activities;
- Embed valorisation within the quality care systems of partners;
- Realisation of knowledge portals and marketplaces, where demand and supply may easily find each other, both at regional as well as at national level.

CSF IV: Availability and development of expertise

CSF V: Sufficient financial resources

ANNEX 3 REFERENCES

Chapter 1:
ECORYS (2007), The State of European Cities: adding value to the European Audit (Client: EC, DG Regio), http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/urban/stateofcities_2007.pdf

Bureau Louter (2007), Economische monitor Delft 2007, http://www.bureaulouter.nl/downloads/delft07/EconomischeMonitorDelft07versie11preview.pdf

Rotterdam (dec. 2008), 'Spreiding van studenten wonend in Rotterdam, project Student City'

Rotterdam (2008), Economische verkenning Rotterdam, http://www.cos.rotterdam.nl/Rotterdam/Openbaar/Diensten/COS/MOR/PDF/Economische%20Verkenning%20Rotterdam%202008.pdf

Deloitte, 2009, Rotterdamse markt en sectoranalyse Rotterdamse regio

K. Fortuin en P vd Graaf, 2006, De stad verhaalt van de stad, http://www.nicis.nl/kenniscentrum/binaries/kcgs/bulk/onderzoek/2006/5/d3472246.pdf

SEO (2009), Review of Higher Education Institutions in regional development Amsterdam

W. Jacobs (Erasmus University), 2009, World Port City Networks

Data sources:
- CBS Statline (www.cbs.nl)
- Centre for Research and Statistics, Rotterdam (www.cos.rotterdam.nl)
- HBO Raad (www.hbo-raad.nl)
- VSNU (www.vsnu.nl)
- TU Delft (www.tudelft.nl)
- Hogeschool INHOLLAND (www.inholland.nl)
- Hogeschool Rotterdam (www.hogeschool-rotterdam.nl)
- Erasmus University (www.eur.nl)
- LISA (www.lisa.nl)

Chapter 2:

Aa, R. van der, Kans, K. & Nuland, E. van (2009). *Techniekbarometer Rijnmond 2008/2009. Ontwikkelingen op de arbeidsmarkt en in het beroepsonderwijs in de sectoren techniek, transport en logistiek*. Rotterdam: ECORYS

ARWU (2009), "Academic Ranking of World Universities 2008," Shanghai Jiao Tong University, http://www.arwu.org/rank2008/EN2008.htm (06-07-2009)

Cuelenaere, B. & Siegert, J. (2009). *Arbeidsmarktverkenning Mainport Rotterdam 2008-2012. Meting 2008*. Rotterdam: ECORYS.

HBO-raad (2008a), "Feiten & Cijfers," http://www.hbo-raad.nl/hbo-raad/feiten-en-cijfers (accessed 03-04-2009)

HBO-raad (2008b), "Lectoraten," http://www.hbo-raad.nl/onderzoek/lectoraten (accessed 02-04-2009)

HBO-raad (2009a), "Overzicht van Hogescholen," http://www.hbo-raad.nl/hogescholen/overzicht-hogescholen (accessed 02 -04-2009)

HBO-raad (2009b), "Inschrijvingen 2008," http://www.hbo-raad.nl/hbo-raad/feiten-en-cijfers/cat_view/60-feiten-en-cijfers/63-onderwijs/75-inschrijvingen (accessed 02 -04-2009)

HBO-raad (2009c), "Naar een Nieuwe Verenigingsagenda: Green Paper," January 2009, http://www.hbo-raad.nl/hbo-raad/publicaties/cat_view/43-publicaties/115-2009 (accessed 29-04-2009)

INHolland (2008), *Feiten en cijfers Jaarverslag 2008*, Den Haag. www.inholland.nl

Jongbloed, B., Salerno, C. and Huisman, J. (2004), "Bekostigd en Niet Bekostigd Hoger Onderwijs: Programma's en Klanten," Center for Higher Education Policy Studies (CHEPS), 29 January 2004

Jonge, J. de and Berger., J. (2006), "OECD Thematic Review of Tertiary Education: The Netherlands," Report Prepared for the Ministry of Education, Culture and Science, EIM Onderzoek voor Bedrijf & Beleid

KNAW (2007), "Jaarverslag 2007," Konkinklijke Nederlandse Akademie van Wetenschappen, http://www.knaw.nl/publicaties/pdf/20081005.pdf (accessed 16-04-2009)

Leiden Ranking (2009), "Top 100 Universities in Europe – Green List," http://www.cwts.nl/ranking/top100_green_lst.html (accessed 06-07-2009)

MinEZ (2004), "Pieken in de Delta: Gebiedsgerichte Economische Perspectieven," Ministry of Economic Affairs, July 2004, http://www.ez.nl/Onderwerpen/Meer_innovatie/Pieken_in_de_Delta (accessed 29-04-2009)

MinOCW (2006), "Factsheet Leerrechten," Ministry of Education, Culture and Science, http://www.minocw.nl/documenten/factsheetleerrechten.pdf (accessed 16-04-2009)

MinOCW (2007a), "The Education System in the Netherlands 2007," Ministry of Education, Culture and Science, The Hague, November 2007

MinOCW (2007b), "Het Hoogste Goed: Strategische Agenda voor het Hoger Onderwijs-, Onderzoek –en Wetenschapsbeleid," Ministry of Education, Culture and Science

MinOCW (2008), "OECD Thematic Review of Tertiary Education: Update of Country Background Report for the Netherlands," Ministry of Education, Culture and Science, 20 March 2008

Nuffic (2008), "Factsheet 'The Education System in the Netherlands'," http://www.nuffic.nl/international-students/dutch-higher-education/education-system (accessed 28-04-2009)

NWO (2007), "Jaarverslag 2007," Nederlandse Organisatie voor Wetenschappelijk Onderzoek, http://www.nwo.nl/files.nsf/pages/NWOA_7G7QHT/$file/jaarverslag2007_26juni_final.pdf (accessed 16-04-2009)

OECD (2008a), "OECD Reviews of Tertiary Education: Netherlands," http://www.oecd.org/document/47/0,3343,en_2649_39263238_41570095_1_1_1_37455,00.html (accessed 09-04-2009)

OECD (2008b), "Education at a Glance, OECD Indicators 2008," http://www.oecd.org/document/9/0,3343,en_2649_39263238_41266761_1_1_1_1,00.html (accessed 09-04-2009)

ROA (2007), "De Arbeidsmarkt naar Opleiding en Beroep tot 2012," Researchcentrum voor Onderwijs en Arbeidsmarkt, Universiteit Maastricht, ROA-R-2007/4

Sijgers, I., Hammer, M., Horst, W. ter, Nieuwenhuis, P and Sijde, P. van der. (2005), "Supporting the Contribution of Higher Education Institutes to Regional Development," Self-Evaluation Report of Twente, Prepared for the OECD Review of Higher Education Institutions in Regional Development 2005-2006

SKO (2008), "Lectoraten in het Hoger Beroepsonderwijs 2001-2008: Eindevaluatie van de Stichting Kennisontwikkeling HBO," Stichting Kennisontwikkeling HBO, December 2008

Statistics Netherlands Statline (2007a), "Beroepsbevolking; behaalde onderwijs naar herkomst geslacht en leeftijd," http://statline.cbs.nl/statweb/ (accessed 09-04-2009)

Statistics Netherlands Statline (2008e), "Onderwijsuitgaven; kerncijfers," http://statline.cbs.nl/statweb/ (accessed 09-04-2009)

Statistics Netherlands Statline (2009a) , "Voortgezet onderwijs; leerlingen en geslaagden naar schoolsoort," http://statline.cbs.nl/statweb/ (accessed 09-04-2009)

Statistics Netherlands Statline (2009b), "Hoger onderwijs, ingeschrevenen naar studierichting en leeftijd," http://statline.cbs.nl/statweb/ (accessed 09-04-2009)

Statistics Netherlands Statline (2009c), "Hoger onderwijs, eerstejaarsstudenten naar vooropleiding en studierichting," http://statline.cbs.nl/statweb/ (accessed 09-04-2009)

Statistics Netherlands Statline (2009e), "Hoger onderwijs, ingeschrevenen naar herkomstgroepering," http://www.statline.nl (accessed 14-8-2009)

Stichting Innovatie Alliantie (2009), http://www.innovatie-alliantie.nl/?id=223&t (accessed 29-04-2009)

Stichting Innovatie Alliantie, (2009). *RAAK! Beleidsevaluatie 2005-2008.* Den Haag: SIA.

THES (2008), "World University Rankings 2008," Times Higher Education Supplement, http://www.topuniversities.com/worlduniversityrankings/results/2008/overall_rankings/fullrankings/ (accessed 06-07-2009)

Versleijen, A., van der Meulen, B., van Steen, J., Boneschansker-Kloprogge, P., Braam, R., Mampuys, R. and van den Besselaar, P., "Dertig jaar publieke onderzoeksfinanciering in Nederland 1975-2005," Rathenau Instituut, pp. 1-94

VSNU (2009a), "Totaal aantal ingeschreven studenten," http://www.vsnu.nl/Universiteiten/Feiten-Cijfers/Onderwijs.htm (accessed 02 -04-2009)

VSNU (2009b), "Ingeschreven studenten naar HOOP-gebied," http://www.vsnu.nl/Universiteiten/Feiten-Cijfers/Onderwijs.htm (accessed 02 -04-2009)

VSNU (2009c), "International University Rankings" http://www.vsnu.nl/Universiteiten/Feiten-Cijfers/Onderwijs.htm (accessed 09 -04-2009)

VSNU (2009d), "Ontwikkeling rijksbijdrage universiteiten," http://www.vsnu.nl/Universiteiten/Feiten-Cijfers/Financin/Ontwikkeling-rijksbijdrage-universiteiten.htm (accessed 09-07-2009)

Weert, E. de and Boezerooy, P. (2007), "Higher Education in the Netherlands," International Higher Education Monitor Country Report, Center for Higher Education Policy Studies (CHEPS)

Chapter 3:
References can be found in the footnotes of chapter 3 (weblinks) that refer to the projects mentioned and also in annex 6 these weblinks can be found.

Chapter 4:
Werkgelegenheidsmonitor najaar 2007 en voorjaar 2008; Economische Verkenning Rotterdam 2008

Final report: "Alternative investment in education: economic effects of talent leaks in the Rotterdam region", October 2008

Deltaplan Rotterdam Education, April 2009

Chapter 5:
PM

Chapter 6:
De Randstadhogescholen, motoren van onze economie, mei 2007 (hoofdocument G 5)
TU Delft & Kennisvalorsatie, the nest perpective, TU Delft, 2007
Gemeentelijk Uitvoeringsprogramma Haven en HIC 2008-2012 , Ontwikkelingsbedrijf Rotterdam, juni 2008
Plan van aanpak kredietcrises, B&W Rotterdam, 12 maart 2009
Plan van aanpak Rotterdam Climate Campus, januari 2009
Economische Ontwikkeling Rotterdamse Gezondheidszorg, Jaarplan 2009

Creatieve Economie, Uitvoeringsprogramma 2009. Ontwikkelingsbedrijf Rotterdam: http://www.bds.rotterdam.nl/content.jsp?objectid=197865&highlights=patching%2Czone&frompage=search_quick&sr=t

ANNEX 4 RESEARCH INSTITUTES AND RESEARCH CENTERS

Research institutes TU Delft[24]

Research institutes are research organisations that vary enormously in terms of accreditation, size and the participation of disciplines. TU Delft has three officially recognised research institutes: the Interfaculty Reactor Institute IRI, the Research Institute for Housing, Urban and Mobility Studies OTB and the International Research Centre for Telecommunications-transmission and Radar IRCTR. The latter comes under the Electrical Engineering, Mathematics and Computer Science faculty EWI.
TU Delft also takes part in three of the four top institutes recognised by the Minister: Nutrition, Metals, Telematics and Polymers. Scientific management of the top institute, Metals (NIMR), takes place in Delft. There are numerous smaller research institutes, which have no official accreditation.

- BKC - BatchKennisCentrum
- CCD - CIM Centrum Delft
- DCA - Delft Centre for Aviation
- DCED (Delft Centre for Engineering Design
- DEOS - Delft Institute of Earth Observation and Space Systems
- DIDE - Delft Instituut voor Duurzame Energie
- DIMES - Delfts Instituut voor Micro-Elektronica en Submicrontechnologie
- DISens - Delft University Research
- DITSE - Delft Institute for Information Technology in Service Engineering
- Delft Cluster
- DUWIND - Delft University Wind Energy Research Institute
- Hechtingsinstituut TU Delft
- ICTO Programma TU Delft
- IRCTR - International Research Centre for Telecommunications-transmission and Radar
- Interduct
- Kavli Institute of Nanoscience
- KID - Koiter Institute Delft
- NIMR - Netherlands Institute for Metals Research
- Onderzoeksinstituut OTB
- SIMONA - International Research Institute for Simulation, Motion and Navigation Technologies
- VEMC - Vermogenselektronica en Elektromagnetisch Conversie Centrum
- intelligent Systems consortium (iSc)

[24] Source: http://www.tudelft.nl/live/pagina.jsp?id=d900ce35-5afb-4b41-a601-63a6fdfb76b7&lang=en

Research institutes Erasmus University[25]

Erasmus University Rotterdam has 20 research schools that have been accredited by the Accreditation Committee (ECOS) of the Royal Netherlands Academy of Arts and Sciences (KNAW). EUR is the secretary of 6 and a participant in 14 KNAW-accredited research schools. Besides the research schools mentioned beneath, the faculties also have research institutes and research centres.

EUR faculty research school (secretary EUR)

- Cardiovascular Research School Erasmus University Rotterdam (COEUR)
  Faculty research school of Erasmus MC – Faculty of Medicine and Health Sciences
- Erasmus Research Institute of Management (ERIM)
  Interfaculty research school of the Rotterdam School of Management and the Rotterdam School of Economics

Interuniversity research schools (secretary EUR)

- Tinbergen Institute (TI)
  Interuniversity research school of three faculties of Economics: Erasmus University Rotterdam, Universiteit van Amsterdam (UvA) and the Vrije Universiteit Amsterdam (VU)
- Netherlands Institute for Health Sciences (Nihes)
  Interuniversity joint venture involving Erasmus MC / Erasmus University Rotterdam, Amsterdam Medical Center / University of Amsterdam, Netherlands Cancer Institute (NKI), National Institute of Public Health and the Environment (RIVM), University Medical Center St Radboud / Radboud University Nijmegen, and University Medical Center Utrecht / Utrecht University.
- Postgraduate School Molecular Medicine / MM
  Interuniversity research school Faculty of Medicine and Health Sciences
- Research School Safety and Security in Society (OMV)
  Interuniversity research school, School of Law in collaboration with the Europa Instituut Leiden (ULEI), the VU, the Netherlands Organisation for Applied Scientific Research TNO and the Netherlands Institute for the Study of Crime and Law Enforcement (NSCR)

EUR participates in the following interuniversity research schools

- Medical Genetics Centre South-West Netherlands (MGC)
  Erasmus MC / Faculty of Medicine and Health Sciences
  MGC is a participant in the top research school Centre for Biomedical Genetics (CBG)
- Helmholtz School for Autonomous Systems Research
  Erasmus MC / Faculty of Medicine and Health Sciences
- Netherlands Institute of Government (NIG)
  Faculty of Social Sciences
- Huizinga Institute, Netherlands Graduate School for Cultural History
  Faculty of History and Arts
  Faculty of Philosophy
- Interuniversity Research School N.W. Posthumus Institute
  Faculty of History and Arts
  Faculty of Philosophy
- Netherlands Research School for Transport, Infrastructure and Logistics (TRAIL)
  Rotterdam School of Management, Faculty of Social Sciences

[25] Source: http://www.eur.nl/english/research/schools_and_institutes/

- Amsterdam School for Social Research (ASSR)
  Faculty of Social Sciences
- Netherlands School for Research in Practical Philosophy
  Faculty of Philosophy, Erasmus MC / Faculty of Medicine and Health Sciences
- National Research School for Human Rights
  School of Law
- Experimental Psychology Research School (EPOS)
  Faculty of Social Sciences
- Center for Resource Studies on Human Development (CERES)
  School of Law
- Kurt Lewin Institute
  Faculty of Social Sciences

Senior lectureships Rotterdam University

- Human centred ICT
- Communication in a digital age
- Business Development
- Innovative entrepreneurship
- Ideal Harbour
- Product innovation by practice
- Smart Energy
- Logistics
- TransUrban
- Enterprise Risk Management
- Urban Education
- Lifelong learning and Social quality
- Primary health care
- Prevention, labour and health care
- Transitions in care
- Cohesion in elderly care
- Enhancing vocational education

Senior lectureships INHolland Rotterdam

- E-Learning
- Cross-media, Brand, Reputation & Designmamagement
- Digital World
- Dynamics of the city
- Democracy
- Corporate Finance & Government

ANNEX 5 COOPERATION IN HEALTH CARE

Erasmus MC and the regional Municipal Health Services (MHS), and also other parties like hospitals, have several joint projects aimed at the local situation. A few examples ares stressed out here.

ERGO ("Rotterdam Study")
A population study about ageing healthy and geriatric disseases started in the nineties. The study follows 8,500 healthy people aged over 55 in Ommoord. Recently the study was extended to 45+. In academic literature the study became known as the "Rotterdam Study".

Centre for Effective Public Health In the larger Rotterdam area (CEPHIR)
In 2008 research of Erasmus MC showed that people of Rotterdam have a life expectancy rate that's 1.5 years less than for average Dutch. The study shows that environmental measures and primary preventive interventions in lifestyle of youth and primary health care the best wil give the best results. Also due to this study the local government made healthy school, enhancing primary health care, centre for education and work and stimulating a healthy living environment by urban development to priorities of policy.

This activity is part of the longer existing cooperation in the academic workplace CEPHIR (Center for Effective Public Health In the Rotterdam area), one of nine academic worplaces in the Netherlands in the area of public health care, who where fouded with financial support of ZonMw. CEPHIR brings together reasearch, policy and practice in public health care so an interaction arises between knowledge development, policy making and services. Without this long tradition the project would not succeed.

Erasmus MC-Sophia Birthing Centre: an innovative Dutch alternative for home births in deprived districts
In October 2009, the Sophia Birthing Centre, the first of its kind in The Netherlands and built on the roof of the Erasmus MC-Sophia Children's hospital, will open providing care for 1000 community deliveries yearly. This initiative is part of a municipal program, co-directed by the Erasmus MC, to improve urban perinatal health in Rotterdam. Over the years, the number of home births in Rotterdam has been falling to 10% of all deliveries (as compared to 30% in The Netherlands). The resulting shift towards hospital births led to capacity shortfalls because of a relative shortage of delivery suites in hospitals. New innovative primary care birthing centres can guaranty immediate availability of specialised care in case of obstetric emergencies. These birthing centres do more than simply provide a solution for the capacity deficit in the hospitals. In deprived urban districts, the home situation often is not suitable for safe delivery or for the care of mother and baby in the first days following birth. A birthing centre offers mother and baby a good and safe alternative. After delivery, mother and baby can stay in the birthing centre - with professional maternity care on hand - for at least four days.

Erasmus Centre for Migration, Ethnicity and Health (ECMEH)
Though this isn't a cooperation with the MHS but interfaculty cooperation, this interesting initiative is stressed out here. Purpose is concentrating knowledge from several scientific areas (sociology, economy, health care and medicine) to stimulate high-quality education and research in the areas of migration, etnicity, and ethnic differences in health and health care. This combination of knowledge areas in one centre is unique in the Netherlands. The initiative is financed by the Board of the EUR and the Trustfund. The next main and subtopics are considered for the future:

- Health of several ethnic groups and health differences between several ethnic groups
- Differences in use of health care between different ethnic groups
- Career medicin students and assistant physicians of immigrant origin
- In and troughput of staff of immigrant origin in health care

GeNeRO, network that interconnects the first-, second- and third lines of care for the elderly in the south-west of the Netherlands.
In 2008 the Erasmus MC initiated GeNeRO, a network for professionals from health care, community services, and companies, volunteers involved in elderly care. The network is centered around Rotterdam and extends into parts of the provinces of *Noord-Brabant, Zeeland* and *Zuid-Holland.* Within one year a variety of partners (general practitioners, pharmacies, healthcare organisations, hospitals, companies, health insurance company's communities, associations etc.) has joint the network, to actively participate in its activities. The aim of the network is to redesign and restructure the elderly care throughout the entire healthcare chain, focussing on the problems encountered by the so-called frail elderly. Frail elderly may be physically, psychologically, socially or economically (and combinations thereof-) handicapped in their daily life, and experience a strong dependence on their social networks. Projects aimed at demonstrating new concepts in care and welfare may apply for public founds, that have been made available through the ministry of Health Welfare and Sports in the framework of the National Programme of Elderly Care. Erasmus MC is organiser of the network, participates in innovation projects, and provides advice and coaching to network participants.

ANNEX 6 LINKS TO WEBSITES

- Kansen voor West, more information can be found on the following website: www.kansenvoorwest.nl
- Pieken in de Delta, more information can be found on the following website: http://www.ez.nl/Onderwerpen/Overig/PID_Zuidvleugel_Randstad and http://www.senternovem.nl/pid/
- The Clusterregeling Provincie Zuid-Holland, more information can be found on the following website:http://www.zuid-holland.nl/overzicht_alle_themas/thema_economie_werk/c_e_thema_economie-innovatieve_clusters.htm
- Student Lab, more information can be found on the following website: www.scholierenlab.nl
- Erasmus University Rotterdam, more information can be found on the following website: www.eur.nl
- InHolland, more information can be found on the following website: www.inholland.nl
- Hogeschool Rotteram, more information can be found on the following website: www.hogeschool-rotterdam.nl
- Ontwikkelingsbedrijf Rotterdam, more information can be found on the following website: www.obr.nl
- Compilation sites: www.lectoren.nl, www.kennisalliantie.nl and www.sko-HPE.nl, www.HPEkennisbank.nl

ANNEX 7 PROFILES

Erasmus University Rotterdam

Regional engagement EUR	
Mission Statement for regional engagement	Dedication to regional needs is increasingly part of the EUR policy. The linkages with the regional community have been noted in the Strategic Plan for 2013. It has however not been adopted as a vital strategy for the viability of the EUR.
Organisation on the centralised level for regional activities • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	a. The Institutional Development Office is in charge of realising the goals set in the Strategic Plan, including the goals directed at strengthening the relationship with the environment. b. Most important communication channels are individual network contacts and the EDBR. Within the institution the chairman of the board of directors is responsible for regional decisions.
Are there financial arrangements or funds to facilitate regional cooperation at the central level of the institution?	The central government pays for regional cooperation. The arrangement for knowledge workers (which involves the input of new resources) is initiated by the Ministry of Economic Affairs. The board of directors has decided to let faculties handle their own arrangements. The faculties are requested to use the network of the organisation and scientific staff to create a list of possible candidates (businesses). SSC HR&F coordinates this arrangement.
The organisation at the decentralised level • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	Within the framework of the Strategic Plan agreements between centralised and decentralised (the faculties) level have been made in which has been agreed how the faculties will approach the enforcement of the relationship between the EUR and its environment. On a decentralised level there are no specific functions that carry regional responsibility.
Are there different entities that realise regional activities? If so, name preferably the different work units, institutes and knowledge circles.	1. For several topics chairs have been established. These can comprise research of metropolitan situations such as Rotterdam (like the chair metropolitan issues in sociology) or can be chairs established at an social institution in Rotterdam (like the GGD and IVO). 2. Two holdings are created for a diversity of operating companies, which enables them to carry out work in the region (RHV, SEOR, Risbo). 3. Within the EUR itself multiple institutes exist with a regional

	focus, like ERIPORT (port related), Centre for entrepreneurship (supporting start ups at RSM) and Drift (social sciences).
Are there special forms of multidisciplinary cooperation in regional activities worth mentioning?	Pact op Zuid, Generation R
Who are the preferred partners in regional cooperation? (max 5)	GGD (health sector) RCI City of Rotterdam Port of Rotterdam Authority
Is regional/community involvement imbedded in the educational programmes? If yes, how many ECTS credits are dedicated to this?	Some programmes are offered, like a minor on service learning
HRM and Financial Management	
Do arrangements exist to stimulate regional involvement among employees?	Fulltime employees have the opportunity to spend 8 hours per year on volunteer work at institutions in society since 2009. WorkMate was set up as pilot for SSC's, UB and EUR policy departments. Faculties can sign up when employees express their interest.
Is decentralized budgeting an option?	The faculties are free in their spending, but there are restrictions concerning quality of research and education.
Is knowledge valorised in the region? Examples?	The operating companies within the EUR and Erasmus MC holdings offer the chance to valorize and disseminate knowledge in the community, obtained with fundamental research. Aims of the EUR holding are: • Realization of a university related framework for entrepreneurial employees within EUR and Erasmus MC; • Enlargement of the EUR and Erasmus MC portfolio of contracting activities. Currently 12 operating companies exist within the EUR, and 19 within the Erasmus MC. Spin offs are created and actively supported, amongst others with financial support.
Organisation	
Are there forces impeding regional involvement?	Most impeding are the demands in terms of academic output that exist for employees. The criteria became more stringent, which made it more difficult for employees to focus on regional demands. Because of this, employees will always prefer projects with a significant academic pay-off. Two-sided unfamiliarity also obstructs regional involvement. The Rotterdam University, for example, is located very nearby the Erasmus MC, but cooperation is still limited.
Key themes for regional involvement, used by the HEI to profile itself (potentially with other HEI) (Max 5)	Medical and care Urban issues Port and transport Entrepreneurship

INHolland University

Regional engagement	
Mission Statements for regional engagement	INHolland is close in touch with students, business community and society. It focuses on the needs for education and applied science.
Organisation on the centralised level for regional activities • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	- Director meetings in the Rotterdam location - Project group G4-G5 - Participation in EDBR, Kennisalliantie, HOOR, etc.
Are there financial arrangements or funds to facilitate regional cooperation at the central level of the institution?	Because of covenants and arrangements for subsidies, central budget contributes to financing. For Schools and senior lectureships, this is done according to objectives and agreements.
The organisation at the decentralised level • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	- Service Centre Entrepreneurial activities - Learn – work combinations / project bureaus - Research and Innovation Centres
Are there different entities that realise regional activities? If so, name preferably the different work units, institutes and knowledge circles.	- Project group IN-ZICH-IN (stimulating knowledge valorization SME Rotterdam) - Senior lectureships
Are there special forms of multidisciplinary cooperation in regional activities worth mentioning?	Examples of regional activities by INHolland are: Support of 'broad schools' INWork INHolland; support/advisory desk for companies with questions concerning the (educational) consequences of the economic crisis - Team internships; (V)MBO (SVE) en HPE students cooperate within projects.
Who are the preferred partners in regional cooperation? (max 5)	EDBR, Kennisalliantie, KvK, DEltalinqs, Foundation for new entrepreneurial activities
Is regional/community involvement imbedded in the educational programmes? If yes, how many ECTS credits are dedicated to this?	Regional involvement is stimulated by various approaches: study assignments with a societal theme, minors dealing with ethics, corporate social responsibility etc. Students are encouraged to be engaged in societal, cultural or governmental work during their studies. Responsibility also needs to be developed and experienced by service learning. In regular programmes, 5 ECTS are dedicated to service learning, in honours programmes 20 ECTS are obtained by extra-curricular activities.

HRM and Financial Management	
Do arrangements exist to stimulate regional involvement among employees?	It is one of the selection criteria for teachers to be part of honours programmes, career development plans and for promotion.
Is decentralized budgeting an option?	Yes, Schools and domains have some liberty for the funding of innovation, research and regional involvement.
Is knowledge valorised in the region? Examples?	Via senior lectureships
Organisation	
Are there forces impeding regional involvement?	Capacity limitations and dispersed projects/initiatives which causes suboptimal cooperation.
Key themes for regional involvement, used by the HEI to profile itself (potentially with other HEI) (Max 5)	Entrepreneurship The Young North Rechtswinkel (Law support desk) SME – desk Professional Educative Partnership

Rotterdam University

Regional engagement	
Mission Statements for regional engagement	Central in the mission of Rotterdam University is the ambition to be a HEI for and from the region. We regard it as our task to educate a number of HPE professionals, to accommodate the community needs. Equally so, it is our job to directly contribute to the development of the profession, in sectors that we participate and educate in. Research is of great importance thereto and is intertwined with education and professional practice in the region.
Organisation on the centralised level for regional activities • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	Structural participation in regional cooperation, strategic partnering and alliances like the Kennisalliantie. The education system and organization of the University are set up in such a way that linkages with community and region are inevitable. Linkages with regional stakeholders on varying levels: Board, some University wide senior lectureships on strategic level, other Boards, City of Rotterdam, EDBR, alliances etc. On University (central) level an External Affairs department is in place to answer questions from business community and to keep in touch with companies, also those who might be unfamiliar with the University. Besides, this department operates as a central portal for internal cooperation on multidisciplinary matters like the coordination of innovation vouchers. A central account manager runs several institution wide accounts and acts as linking pin between institute and the 11 other account

	managers from all institutes. Together, these account managers form a network to take on central questions and demands.
Are there financial arrangements or funds to facilitate regional cooperation at the central level of the institution?	Internal innovation funds are available to stimulate regional cooperation.
The organisation at the decentralised level • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	- Management of institutes and senior lectureships on management level and employer's association - Institute account managers on management/strategic/tactical level
Are there different entities that realise regional activities? If so, name preferably the different work units, institutes and knowledge circles.	Multi-annual themes of Rotterdam focused on innovation (education & research) that can be linked to many institutions can be approached with strategic projects. For this purpose, an external arrangement with partners is being accomplished. A work plan of cooperation is then developed with a programme manager who maintains external relationships and connects people internally (in cooperation with account managers and senior lectureships).
Are there special forms of multidisciplinary cooperation in regional activities worth mentioning?	RDM Campus, cooperative structure aimed at education, research and innovation (MBO Albeda, Rotterdam University, TU Delft and companies wishing to innovate). The RDM campus will develop into a unique spot and incubator for creative/innovative production and new energy sources.
Who are the preferred partners in regional cooperation? (max 5)	City of Rotterdam and Port of Rotterdam Authority Vestia/Woonbron (housing) Erasmus MC City of Drechtsteden and business community
Is regional/community involvement imbedded in the educational programmes? If yes, how many ECTS credits are dedicated to this?	Almost 50% of the curriculum is practice-based, meaning it is guided by case studies or work in practice (internships, projects, research). On average, an annual 18-24 ects are earned by work in practice during the first two years of study and an annual 30 ects during the last two years.
HRM and financial management	
Do arrangements exist to stimulate regional involvement among employees?	Teachers earn a salary according to certain salary scales (10 t/m 13). Quality of teaching is the main performance target, but promotion and salary are related to the effort a teacher puts in external contacts, innovation and research as well. Within the institute, HRM offers training in project-based working methods, contact management, maintaining contacts with external clients, assessment of assignments etc.
Is decentralised budgeting an option?	The institutes are provided with some freedom in the design of their account management, senior lectureships, knowledge management and innovation labs (where teachers and students can work on a multidisciplinary assignment that comes from the surroundings of the University).

Is knowledge valorised in the region? Examples?	More knowledge transfer and exchange than valorisation as such. Senior lectureships play a key role in this spread of knowledge.
Organisation	
Are there forces impeding regional involvement?	Regional involvement and an outside focus is new to the University. It takes some time before this task is incorporated into daily practice within and outside the University.
Key themes for regional involvement, used by the HEI to profile itself (potentially with other HEI's) (Max 5)	Rotterdam University incorporates links to the themes that are urgent for the region in minor programmes, innovation labs and senior lectureships. The University makes a distinction between 14 themes that are put central in education and research and relate to the chapters of this Review. Five of these are: • cultural diversity • water and energy • future mobility • growing up healthily • new concepts in health

TU Delft

Regional engagement	
Mission Statements for regional engagement	Regional engagement is crucial for ambitions in valorization of knowledge
Organisation on the centralised level for regional activities • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	Valorization Centre in cooperation with dep. Marketing and Communication
Are there financial arrangements or funds to facilitate regional cooperation at the central level of the institution?	Lump sum for regional cooperation
The organisation at the decentralised level • Aimed at coordination and matching of the supply and demand side • Aimed at communication and management of regional contacts	Technology Transfer Officers
Are there different entities that realise regional activities? If so, name preferably the different work units, institutes and knowledge circles.	Kennisalliantie, EDBR, Climate Campus, Greenport Campus, Science Port Holland
Are there special forms of multidisciplinary	Rotterdam Climate Campus (Clean Tech Delta), Greenport

cooperation in regional activities worth mentioning?	Campus, HOPE
Who are the preferred partners in regional cooperation? (max 5)	RCI/RCC, EUR, Eneco/EoN, Shell, City of Rotterdam and Port of Rotterdam Authority
Is regional/community involvement imbedded in the educational programmes? If yes, how many ECTS credits are dedicated to this?	Not imbedded in the education programmes.
HRM and financial management	
Do arrangements exist to stimulate regional involvement among employees?	No special arrangements
Is decentralised budgeting an option?	Valorization Centre and faculties are free to budget; 50% own means, 50% external finance
Is knowledge valorised in the region? Examples?	Delft Enterprise, YES Delft and Science Port Holland. Cooperation with industrial partners and Port of Rotterdam
Organisation	
Are there forces impeding regional involvement?	Cultural forces: focus on education and research, not on regional involvement
Key themes for regional involvement, used by the HEI to profile itself (potentially with other HEI's) (Max 5)	Energy, environment, infrastructure and health, entrepreneurship