

RoUTe'14+ strategy memorandum

- **Enhancement of the RoUTe'14 vision document** -

17 May 2011

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1. FOREWORD

This document contains an enhanced version of the RoUTE'14 strategy plan. In spite of our wide range of high-quality programmes and research activities, some of which rank among the best in the world, circumstances have compelled us to accelerate the implementation of certain aspects of the strategy, in an enhanced form. This document is the result of extensive discussions between the Executive Board and various key functionaries in the organization itself, and also of contact with external parties like the Ministry of Education, Culture and Science.

Through our ambitions, we are helping to contribute towards the objective of the Cabinet to put the Netherlands in the top five knowledge economies. We are developing a model for making education at Twente fit for the future. With our combination of sciences and social and behavioural sciences, we are excellently placed to stand out from other universities in the Netherlands, both in terms of teaching and research. For the future, we see many opportunities and possibilities for further strengthening our expertise and for putting it on the national and international map. You can find out about the strategy we will be adopting for that purpose in this enhanced strategy memorandum, RoUTE'14+.

2. INTRODUCTION

In 2008 we, the University of Twente, set out our strategic vision for the future in the RoUTE'14 document. It described what kind of university we want to be, and covered in outline what we want to do in order to further develop and achieve that vision.

The University of Twente is a young research university with a distinctively entrepreneurial character. We are at the forefront of the field of new technology and its significance for people and society. We are working on the key technologies of the future, ICT and bio and nanotechnology, in certain areas of which we rank among the very best in the world. But of course we are also doing much more than that. What makes the University of Twente unique is the marriage of technology with social, business and behavioural sciences, based on the conviction that the most interesting and relevant innovations will take place at the cutting edges of these fields. This provides opportunities for us that we want to exploit to the full.

In RoUTE'14, we have already stated our wish to further enhance our profile, with our starting point being 'High Tech, Human Touch'. We are committed to being socially visible by highlighting our profile in specific areas. In addition, we want to provide a full range of high-quality education programmes in the fields that we stand for, at both undergraduate and graduate level, with differentiation/specialization and profiling in the Master's phase, based on the strengths of our research.

Strengthening our international, national and regional networks and strategic alliances is another important RoUTE'14 objective, both from the point of view of our social mission and our competitive position.

RoUTE'14 is the guiding principle for the University of Twente strategy. However, changes in the circumstances in which we find ourselves have obliged us to quickly enhance the focus of our strategy. Despite our wide range of high-quality education programmes, our market share among all the target groups is lagging behind. Part of the government coalition agreement entails a significant reduction in government funding in the next few years for universities, including the University of Twente. The proposals of the Veerman Committee, which will be largely adopted by the current cabinet, require that universities come up with a much more substantive profile. The Minister of Education, Culture and Science and the universities (the VSNU – the Association of Universities in the Netherlands) are working on the composition of a new management agreement, to include improvements to the quality of teaching, a higher profile for Master's programmes and research, and the national coverage of Bachelor's phase education. Our enhanced strategy plan, RoUTE'14+, serves to anticipate and respond to the aforementioned external developments, and we will be stepping up the pace of implementation for the purpose of renewing our teaching and research landscape.

With RoUTE'14+, we are building on the progress we have made in the past two-and-a-half years since the launch of RoUTE'14. The importance of high-quality teaching, educational renewal and the recognition of education have been put more emphatically on the agenda. An integrated education vision was presented in April 2010, pointing the direction in which education at UT is to develop further. Two working groups are actively working out the details of the vision: the Education Renewal working group (improving the quality, attractiveness and pass rate of our Bachelor's courses) and the Positioning and Quality Improvement of Master's Education working group. In addition, two virtual operational units have been set up in the organization of education. All activities linking VWO ('pre-

university education') schools have been brought together in the *Loket Voortgezet Onderwijs* (LVO – secondary school service desk). Fifteen programmes and around 150 PhD students are now part of the Twente Graduate School (TGS), spread over various disciplines.

The *Nota Sturing Onderzoek* ('research planning memorandum') contained specific details about how our research activities should be profiled. In terms of research performance, we can state that the average for every independent assessment score has risen. There have also been favourable developments in the area of research prizes and grants. Examples that come to mind include the Spinoza Prize for Albert van de Berg in 2009, as well as various NWO-VICI (Netherlands Organization for Scientific Research) grants in 2009 and 2010 and several other prizes and grants.

We have significantly strengthened our networks in recent years, collaborating with fellow universities in the 3TU Federation, and exploring possibilities with universities in the north-east of the Netherlands (Groningen, Nijmegen and Wageningen) and in Germany (Münster). Major successes have been achieved in cooperation with industrial partners, such as Boeing, Siemens and BP. An example of further regional embedding is the founding of two *Overijsselse Centra voor Research en Innovatie* (OCRI – research and innovation centres) with the province of Overijssel. The objectives and character of these forms of collaboration are complementary.

The RoUTE'14 Strategy has been laid down in a number of documents, such as *RoUTE'14 Strategische visie 2009-2014* and *Nota Sturing Onderzoek*, which make up part of the *Portfolio Instellingsstrategie* (institutional strategy portfolio). The University Council has already endorsed the portfolio and its component parts.

RoUTE'14+ is University of Twente's enhanced strategy plan, and is a response to the changing circumstances with which the university is faced. This memorandum contains the following chapters: Profile of the University of Twente (Chapter 2), Background to the enhanced strategy (Chapter 3), Objectives and starting points of RoUTE'14+ (Chapter 4), Strategic choices for Research (Chapter 5), Strategic choices for Education (Chapter 6), University College (Chapter 7), Vision on the development of the support services and campus (Chapter 8), our implementation methods (Chapter 9) and finally the financial aspects (Chapter 10).

2. PROFILE OF THE UNIVERSITY OF TWENTE AND EXPLANATORY NOTES

The profile of the University of Twente, as set out in the RoUTe'14 strategy, is summarized as **High Tech, Human Touch**.

We translate this as follows:

The University of Twente is a modern research university with a decidedly entrepreneurial character, where technology and life sciences come together. The development and application of relevant modern technology are key. The main areas of focus of research at the University of Twente are nanotechnology, biomedical technology, ICT, green energy and governance. Technical, natural, social, business and behavioural sciences, firmly embedded in disciplines and technologies, work jointly on resolving society's challenges. This implies that technology is application-based. Our knowledge of the life sciences makes a significant contribution to this. The current period of major changes at national level requires us to work all the harder at maintaining our identity.

We highlight the relevance and applicability of our innovations around themes with a prominent position on the national and international agenda. In RoUTe'14, these themes include health, renewable energy, water, security and learning. In recent years, extra emphasis has been placed on the themes of energy and health. The relevance of social themes changes gradually over time. Our strength is mainly embedded in the content: the technologies and disciplines on which our main focus lies. This content is the point of departure from which we are in a position to respond flexibly to the changing social agenda and from which we can find solutions for current social themes, which vary over time. In that connection, we are making more room for entrepreneurship and the campus is being given a fresh impetus.

The undergraduate programmes are explicitly academic and design-based, and encourage an entrepreneurial attitude. Among our chief goals as an academic institution is to induce a critical and analytical approach in our students, aimed at finding solutions to complex problems. This is expressly about transferable skills that can be applied across a wide range of areas. The range of Master's programmes on offer reflects the university's most important fields of research. Our Graduate School continues to grow and is highly attractive for talented researchers worldwide. We are working together with VVO schools in the region on a structural basis in order to improve their relevance to and connection with our programmes and to train teachers.

Strengthening our networks is also an important way of improving our opportunities at the national and international level, both closer to home and further afield.

The details of the partnerships with universities in the north-east Netherlands and the nearby German Länder are currently being worked out. In concrete terms, an inventory is being drawn up for five key themes, including energy and technology, to see how, by working together, we can mutually enhance our research. We are also keen to involve the various regional government bodies in our collaborative partnerships – not just for material support, but primarily in order to fulfil our mission to deploy our knowledge for resolving social issues. These partnerships can also serve to give meaning to certain parts of our enhanced strategy (such as the courses we offer). At the same time, our participation in the 3TU Federation is continuing. The objectives and the character of all these forms of collaboration are complementary.

We continue to take our responsibility for upholding the interests of the region, which remains important to us. Our partnerships with local businesses and government bodies are healthy and are being expanded upon. The University of Twente encourages knowledge-intensive entrepreneurship, and at the same time would also like to make the region more attractive for highly-qualified professionals from both inside and outside the Netherlands.

In order to realize these aims, it is essential to attract, develop and hold onto talented individuals (from the ambitious school pupil to the seasoned researcher). This is at the heart of our HRM policy and is facilitated by an organization with smaller and flexible groups and a system of tenure tracks.

Further afield, too, the University of Twente is exploiting opportunities at international level by strengthening its research networks. Among the ways we do so is by making agreements regarding the exchange of students and staff, and the arrangements by which they can progress from one programme to another, with a select group of partner universities. To that end, we have identified a number of countries as part of our 'target countries policy', in which we are targeting investment at the development of long-term relationships and at setting up exchange programmes. The networking expertise of the ITC faculty, which stretches back many years, is very significant in this respect.

The RoUTE'14+ strategy plan is not a one-on-one translation of the above profile from macro to meso and micro level. Its core message, 'High Tech, Human Touch', is fuelled by the science and social science programmes. The result is a university in which social, business and behavioural sciences are aimed at technology (and the context of technology) and vice versa. The integrated approach of these various sciences will be most noticeable in the Master's courses and in a large part of our research activities. However, there will always be areas in which teaching and research is aimed at either the high-tech or human touch aspect. There should always be sufficient teaching capacity in every University of Twente discipline in order to retain a prominent position in the academic field.

3. BACKGROUND TO THE ENHANCED STRATEGY

This chapter deals with the need to enhance the strategy of the University of Twente (RoUTE'14), which has resulted in the RoUTE'14+ enhanced strategy plan.

RoUTE'14 involves a more clearly defined profile and an improvement in the quality of research, teaching and all the relevant support services, and since 2008 it has been enhanced to a certain extent. The *Nota Sturing Onderzoek* (research planning memorandum) introduced a clear focus to our research activities, while the *Onderwijsvisie* (vision on teaching), presented in 2010, forms the central agenda for improving the quality, attractiveness and pass rate of our courses.

There have, however, been developments of late, some external and others within the University of Twente itself, which have prompted us to enhance our objectives and strategy even more, and even more quickly.

The most significant of these developments are:

- The need for a more clearly defined profile;
- Relatively cumbersome research infrastructure;
- Relatively low market share;
- Internationalization;
- Poor pass rates and slow progress by students;
- Wide range of relatively small programmes;

- Falling levels of government financing.

Each of these developments is covered in greater detail below.

The need for a more clearly defined profile

One of the purposes of RoUTE'14 is to raise our profile. Important strategic choices have been made in terms of research and teaching in the past to that end. We are focusing on those areas in which we excel. In that respect, the strategy we have chosen is in line with the proposals of the Veerman Committee. These proposals, which have largely been adopted by the current Cabinet, require universities to markedly raise their substantive profiles. Under consideration as a means of achieving this is the linking of financial support to the various profiles. Universities, including the University of Twente, will focus on research fields in which they excel, but in order to continue to offer a sufficiently wide range of courses to their regions, universities will have to work more closely together – and this applies to the smaller universities like the University of Twente in particular. This trend is already apparent. However, the Cabinet would like to compensate those universities that succeed in creating a distinctive profile and achieving demonstrable innovations in teaching and research for the reduction in government resources that the universities will be facing in the next few years.

RoUTE'14+ is therefore largely the result of far-reaching national developments, but it also offers opportunities for securing more government resources in due course. Given that it ties in very well with the arrangements in the management agreement being drawn up between the VSNU and the ministry, part of which relate to improvements in teaching, raising the profile of Master's programmes, greater regional alignment of Bachelor's programmes and more detailed profiles of the fields of research, it provides opportunities for obtaining more government support in the medium term.

The University of Twente will promote the profile launched under RoUTE'14 with extra vigour. The Veerman Committee's proposals are an affirmation that the RoUTE'14 course is the right one. Examples from abroad such as Warwick University and EPFL in Lausanne show that targeted strategic options can produce sustained growth in teaching and research. Indeed, it was during a visit to EPFL in the summer of 2008 by the University Management Team (UMT) that they laid the basis for RoUTE'14.

Relatively cumbersome research infrastructure

With six research institutes, the University of Twente has a substantial research infrastructure. For our size and in terms of our available financial resources, the current infrastructure is too cumbersome. Raising our profile also necessitates making choices in this area, too, a process the University of Twente has already embarked upon. The 'Plasterk reduction' was one reason for the University of Twente to focus more sharply on research. The 10% exercise was launched in mid-2010, with the aim of releasing funds for investing in the further growth of outstanding fields of research. The move towards better profiling of outstanding research fields, which we have already set in train, is to be pursued with greater urgency in RoUTE'14+.

Relatively low market share

The University of Twente's market share has fallen back in recent years: from 3.6% in 2005 to 3.3% in 2009. We have noted a decline in market share among males, with a slight increase among females. As regards nationality, the largest drop has been among Dutch students, with a limited decrease among German students. Looking at programmes, the technology and economy profiles show a fall. If the profiles are broken down, it is striking to note that decreases are universal, except in the cases of 'girls, Culture & Society' and 'girls, Nature & Health'. From the information available, it can be

concluded that, from the point of view of the market, the University of Twente offers a good mix of non-technology programmes with a relatively good rate of growth. As far as technology programmes are concerned, the picture is less rosy. The technology programmes we offer are showing relatively limited growth, much less than the market (5.3% compared with 27.3%). Nationally, the performance of traditional technology programmes ranges from limited growth to actual contraction.

'New' technology programmes, like Systems Engineering, Policy Analysis & Management, and Molecular Science & Technology, are growing quickly. These programmes are taught by TU Delft. The latter programme is an expanded version of the former Chemical Technology programme. This demonstrates that one way of achieving growth is to combine modifications to programme content with carefully targeted marketing.

The conclusion is that the University of Twente has a broad-based market share problem: our share is lagging behind in what is a *growing* market. This obliges us to reconsider our range of courses (in terms of content and design) and to target our marketing activities more selectively. The fact that efforts at marketing can be effective is shown by the change in intake numbers for the Business Administration and Public Administration programmes (growth of 100% and 30% in two years, respectively). This growth has been prompted in part by the increased intake of German students and by the focus on that specific market in our marketing activities (source: Analyse Marktaandeel, Stephan van Kuik, S&C Marketing, Jeroen Zijp, Jeroen van Dalen, Boulevard 47, Kim van Berkel, Newcom, 2010).

Internationalization

Higher education is acquiring an ever-more international character – the topic of international student mobility is high on the EU agenda. 'Competition' between universities is no longer contained within national boundaries. This brings extra opportunities, such as attracting foreign Master's and PhD students.

The University of Twente formulated ambitions in the field of internationalization several years ago, as laid down in the *Internationaliseringsvisie* (vision on internationalization). This was translated in 2010 into an action plan, aimed at the further implementation of our internationalization process. The addition of ITC brought a great deal of valuable knowledge and experience of internationalization, and it is being gratefully applied in shaping our internationalization ambitions. Internationalization is not limited to the odd staff department; it is something we will all have to put into practice.

Poor pass rates and slow progress by students

The speed at which students at the University of Twente progress in their studies is worryingly low: it takes four years for 30% of technology students and 40% of non-technology students to obtain a Bachelor's diploma. The University of Twente has one of the highest percentages of long-term students in its ranks, compared with other universities. On 1 May 2011, they numbered in excess of 1,500. We recognize the seriousness of the problem of pass rates and the speed of students' progress. During the last five years, we have agreed with two major external stakeholders that we would achieve substantial improvements in both. This was agreed in late 2005 with the *Platform Bèta Techniek* (PBT), and reaffirmed through the signing of a long-term agreement with the Minister of Education, Culture & Science. Together with the other universities in the Netherlands, we are committed to the objective whereby 70% of the Bachelor's intake obtain a Bachelor's diploma within four years, by 2014.

The aforementioned vision on teaching includes measures for improving pass rates and the speed of students' progress, for both the short and long term. In the short term, we will be concentrating our

efforts primarily at intensifying study support and guidance, while in the longer term it is a restructuring of our courses that will play an important part in bringing about these improvements.

Many small programmes

The University of Twente is a small university with a relatively wide range of programmes, most of which have a modest market share. The differences between the many small and the few large programmes have significantly increased at the University of Twente in recent years. Small-scale programmes have major advantages, such as the intensive contact between the teachers and students, which can have a favourable impact on pass rates. However, programmes should have sufficient critical mass, in terms of students, for them to be economically justifiable. A number of University of Twente programmes do not have this critical mass, which makes our courses expensive in comparison to 'competitor' providers. On the other hand, it is necessary to have a certain volume of courses, especially in the social sciences, in order to be able to attract enough academics and thereby attain a prominent position in the research field.

Falling levels of government financing

The government budget for 2011 reveals the initial long-term outlines of the effects of the planned cuts in public spending. As well as a generic reduction aimed at greater efficiencies in the education budget, our income is set to fall as a result of changes in how research is financed, the termination of the Economic Structure Enhancement Fund and a reduction in the number of grants available for ITC students from the Ministry of Foreign Affairs (Development Cooperation). The total scale of government cutbacks is not yet known (as of April 2011). The Executive Board has decided to set the provisional level of budget restructuring at €15 million, which will be used for improving the quality of our primary process, after deduction of the government cutbacks and the already announced increase in accommodation costs, which will ultimately amount to €4.4 million. The boost to quality will allow us to further raise our profile. In the future, a clearly defined profile will be a more important factor when it comes to securing government funding.

In broad terms, the budgets cuts will be applied as follows:

- €5 million from education and faculty support services;
- €7 million from research and faculty support services;
- €3 million from support services and centrally budgeted tasks.

Finally

In the light of the development as described, the University of Twente must bring greater focus to its strategy, and more quickly. Moreover, in order to realize our strategy, we will have to operate in a variety of networks. This is the only way that we will be able to deal with the effects of the reduction in resources and to use additional savings for further strengthening our excellent teaching and research. The next chapter covers the enhanced strategic objectives and the starting points of the strategy.

4. OBJECTIVES AND STARTING POINTS OF RoUTE'14+

Objectives

The purpose of RoUTE'14+ is to enable the University of Twente to work more vigorously towards improving quality and strengthening its profile in new circumstances, resulting in:

- High-quality and visible focused **research** by using the available resources as efficiently as possible and creating a strong bond with our environment;
- More efficient and better **teaching**, with higher pass rates and an appealing range of courses and interesting content, thereby attracting greater student numbers: '21st-century education';
- **Support services** that are tailored accordingly, and an outstanding **campus**.

Starting points

In order to **raise the profile of research**, the principle whereby all UT research activities are carried out in institutes is being dropped. Institutes are intended for the more fundamental research activities at the University of Twente, with a strong focus on the long term. On the one hand, the groups in the institutes have to meet tough academic requirements, while on the other they very much fit into the profile of an institute. Many of these groups are also highly successful when it comes to valorization. The groups that are housed in institutes on the basis of the aforementioned conditions carry out research for which our teaching can gain accreditation. Relatively speaking, research in institutes receives the most direct government funding.

It may be the case that not enough research is being conducted (in institutes) for a particular programme in order for it to retain its accreditation, for example because of only limited compatibility with the profile of the institute. If retention of the accreditation of the programme in question is important to the University of Twente, then there should be scope for research in the faculty in order to safeguard that accreditation in the future. This research applies to both Bachelor's and Master's education. Teaching capacity is so important that we want to keep it in-house. In this case, financing can be provided at a lower level than for institute-based research, namely from the teaching & research component and the premiums received when PhD students obtain their doctorates.

The unique knowledge position of a number of UT groups is such that the private sector is willing to invest in them. In that case, the valorization activities can take place in the faculty as they serve the interest of the close relationship between the private sector and the University of Twente. The level of financing for these activities can also be cut, because of the financial support from the private sector.

For each category, the research in question should be of an excellent quality.

There is to be a greater differentiation in the link between teaching and research. The profiling in the range of courses is expressed first and foremost in the various Master's programmes that are linked to research (in the institutes). For Bachelor's courses, it is the regional distribution and quality that are important, as well as the profile of Bachelor's teaching. It is assumed that the link between teaching at Bachelor's level and research is organized differently: it is not initially about research in the same discipline as the courses, but it does concern academic skills, such as methodology. In addition, it is conceivable that we will expand the range of Bachelor's programmes in cooperation with research groups from other universities. However, the transfer of academic skills to teaching should be safeguarded. This is how we can remain distinct from the HBO (Universities of Applied Sciences (HBO)).

In order to improve the quality, attractiveness and pass rates of our Bachelor's programmes, we are **redesigning the curricula of the programmes**, with the purpose being to devise courses of and for the future. Our aim is effective education in an academic community, with a culture of high

expectations and with a greater emphasis on learning academic and methodological skills. The link with research should remain sufficiently strong to that end. This, too, will enable our programmes to stand out even better from those offered by the Universities of Applied Sciences.

The new Bachelor's programmes will be designed around adjacent disciplines. As the programmes progress, each individual student will specialize more and more. The new Bachelor's programmes will also make it possible to offer the current small-scale and unviable programmes as modified tracks (majors) within the broader range of programmes. The key question in the redesign of the programmes is which elements belong in a modern academic programme, bearing in mind the link between teaching and research. In redesigning the programmes, we will not necessarily be using the current range of programmes as our starting point.

Becoming embedded and cooperating with our environment remains as important as ever for the University of Twente. We have traditionally had strong links with the public and private sectors in the region. We see it as our social duty to provide high-quality education in the region, with the aim being to provide a wide range in the Bachelor's phase and a distinct and outstanding range in the Master's phase. Cooperation is not restricted to the Twente region or the province of Overijssel – we are also developing our collaborative ties with universities in the north-east of the Netherlands and the neighbouring German Länder. It is through these working relationships that we can fulfil certain aspects of our enhanced strategy, such as our curriculum. At the same time, we will be continuing our partnerships in the 3TU Federation.

We are seeking to have a **student population of 10,000**, spread between sciences and social sciences. The reason this goal was formulated in RoUTE'14 is that this number of students is a requirement for receiving finance for our infrastructure. Depending on developments in relation to government funding and pass rates, an up-to-date intake target will be determined in the near future.

Explanatory notes on the new elements in RoUTE'14+

The RoUTE'14+ strategy plan is based on RoUTE'14, but contains the following new elements:

- Teaching that is more in keeping with the requirements of the future: greater emphasis on academic skills (transferable skills), and less emphasis on actual knowledge transfer;
- Better pass rates and faster progress by students, together with the aim of attaining greater efficiency in Bachelor's courses, by concentrating the range and through a new teaching model;
- Differentiation in the link between teaching and research by raising the profiles of Master's programmes and widening Bachelor's programmes, with greater scope for academic education;
- A distinction is made between fundamental, valorizing and teaching-related research. This will also be translated in terms of their place in the organization and the difference in financing.

In order to prevent any misunderstanding, we will describe here what RoUTE'14+ does *not* involve:

- It is not a traditional cutback operation using salami tactics. In fact, it is about the decision to broaden our range and to create a certain concentration of powerful fields of expertise. Differentiation based on quality is key. However, this does not mean that the balance between technology and non-technology will change. Although some shifts cannot be excluded, the balance of sciences and social sciences remains one of our greatest strengths.
- It is not a fundamental change from the governance model with the matrix of faculties and institutes. Depending on the subsequent details that are worked out, it may be that the

governance model will have to be carefully modified. It cannot be ruled out, for example, that some research activities will no longer be conducted in institutes, nor that the number of faculties will be reduced. However, this depends on the details.

5. STRATEGIC CHOICES FOR RESEARCH

This chapter details and explains the strategic choices in relation to research.

It was decided in the RoUTE'14 strategy plan of 2008 that we would increase our social visibility by raising our profile in specific fields of excellence. The 'research planning memorandum' served to provide specific details of how our research activities should be profiled more prominently. This was followed by the 10% exercise, which had the purpose of releasing funds for investment in the further growth of fields of excellence. From the start of RoUTE'14, raising the profile of research at the University of Twente by focusing on fields of excellence and on improving quality has been key.

RoUTE'14+: greater focus on differentiation

The University of Twente is already ranked among the best in the world in a number of areas of research. Given the successes that we have achieved, a further increase in the quality of our research remains a central objective, across the board. The strategy in RoUTE'14+ takes things further, with an even **sharper focus** on our research and greater differentiation according to its nature and character.

Based on our 'High Tech, Human Touch' profile, we are concentrating on the development of relevant and modern technology and on its application for resolving society's issues. This implies that various types of research are carried out at our university, namely:

- Fundamental research, aimed at the longer term;
- Valorizing research, aimed at the short-to-medium term, and;
- Teaching-related research.

In all cases, UT aims to achieve excellent quality. It should be noted that most research groups perform different types of research, with the accent lying in most cases on one of the three types. All research activities at the University of Twente should be of an excellent standard. Research that does not meet with the University of Twente's high demands for excellence or which is not compatible with the UT profile, will no longer be conducted at the University of Twente. An attempt will be made to find alternatives to these activities.

Primary **fundamental research** refers mostly to nanotechnology, biomedical technology, ICT, governance and our high-profile research in the field of green energy. This research is conducted in the institutes that function as an 'incubator' and 'shop window' – the former as the 'place of birth' of new inventions and the latter as the showcase for the international world of research.

On the one hand, the groups in the institutes meet tough academic requirements, while on the other they very much fit in with the profile of the institute. It has already been mentioned that the demarcation line between fundamental, valorizing and teaching-related research is not clear-cut, and that groups are often successful when it comes to valorization. Accreditation for our teaching can be

gained on the basis of the research carried out by groups working according to strict academic requirements and institute profiles.

The unique knowledge position of a number of University of Twente groups is such that the private sector is willing to invest in them. In that case, valorization activities can take place in the faculty as they serve the interest of the close relationship between the private sector and the University of Twente. The level of financing for these activities can also be cut because of the financial support from the private sector: while direct funding for valorizing research falls, more is available from commercial sources.

Primary valorizing research needs to be positioned and profiled towards its own distinctive market. This research is supported and facilitated by the University of Twente in order that it can operate on the market successfully.

Finally, it may be the case that not enough research is being conducted (in institutes) for a particular programme in order for it to retain its accreditation, for example because of only limited compatibility with the profile of the institute. It has already been stated in this document that if retention of the accreditation of the programme in question is important to the University of Twente, then there should be scope for research in the faculty in order to safeguard that accreditation in the future. Here too, financing can be provided at a lower level than for the institute-based research, namely from the teaching & research component and the premiums received when PhD students obtain their doctorates.

Having only primary fundamental research carried out in institutes will result in a reduction in the number of institutes at the University of Twente, which will allow us to apply a clearer focus on the University of Twente as a whole. The faculties will house the research activities that are needed for teaching-related accreditation or which have a unique valorization position; the research will therefore be substantially self-supporting.

We have been obliged to take the aforementioned strategic decisions due to the expected decline in direct government funding. Part of the reduction in the budget will be absorbed by phasing out certain groups, while the remainder of what we receive in direct funding will have to be allocated more judiciously. Priority will be given to fundamental research ('high risk, high gain'), with valorizing research receiving less from direct funding in relative terms. These groups will have to make up the lost revenue from direct funding from other sources. This means that direct funding will be used for those areas with the greatest need, based on the fact that alternative sources of finance are limited due to the high risk profile of these areas. Financing valorizing research (in part) from alternative sources will therefore result in more direct funding resources being available for the fundamental research groups. The fact that we are investing in them, however, does mean that these groups will have to continue performing at the highest international level. As already stated, the teaching-related research groups will retain their entitlement to the teaching & research component and the premiums received when PhD students obtain their doctorates. However, this does not mean that teaching-related research groups will always receive less financial support. If the quality of the research for a particular programme needs to be improved for accreditation purposes, then part of the budget that has been made available will be allocated for this. Lack of teaching capacity or quality in research are not reasons in themselves for discontinuing programmes that are important to us.

5.1 Restructuring research groups

In this section, we deal with the identification of excellence and the nature of research groups, and how this identification is arrived at.

It goes without saying that both academic research and teaching are of great importance to the University of Twente. The reason that a differentiated assessment of the quality of research first has to be made is related to the fact that the results from independent inspections can be traced back for each individual research group. Testing the quality of the teaching of a specific research group is more difficult and can often be traced back to the assessments made by individuals. Assessing teaching is an integrated assessment, from which the expertise of a research group in that curriculum can be inferred. The assessments of the research groups include the amount of teaching as a quantitative criterion.

In addition, it is possible to generate resources from research in various ways where this is a fixed component for teaching, depending on the number of students.

Having identified excellence and the nature of research groups, scenarios will be developed about what to do with the groups that do not meet the quality requirements as far as academic research is concerned. The contribution made by the groups to teaching will be closely scrutinized in the scenarios. Various future scenarios are described later in this section.

Introducing greater focus and differentiation requires a careful process for the purpose of identifying excellence and the nature of our various research groups. This cannot be done using an algorithm. Research groups are identified on the basis of strategic considerations, with a strategic fit with the institutional profile being an important starting point. Quantitative and qualitative criteria also form the basis for this. The final identification will always have to be supplemented by a balanced overall assessment by relevant experts, and from a variety of perspectives.

The groups have been identified in a process led by the University Management Team (UMT), who were closely and continuously involved. In a series of individual discussions between the Rector and the deans, directors of research and other experts in the relevant fields, the various groups were assessed from a number of angles, including the strategic fit with the profile of the organization and the following quantitative information:

- Independent inspection scores;
- Number of students who have gained their PhD;
- EC realization;
- Direct funding for research;
- Indirect and commercial funding for research.

Qualitative criteria were also defined, including:

- Employee situation (turnover, potential for staff to develop, ability to attract new employees);
- Development phase;
- Growth potential;
- Links with private sector (regional and otherwise) and government bodies.

In order to obtain a proper interpretation of the data and to arrive at a reliable definition of excellence and nature of research groups from a strategic point of view, the quantitative information from the various departments was regarded in the specific context of the department. In certain cases, subject experts from elsewhere were consulted as a means of enlarging the assessment perspective.

The final summarized assessments of the research groups have been accepted by the University Management Team, which means they now form the basis for further restructuring our research landscape. The position at group level is not part of this strategy document. This will be dealt with in a reorganization document, yet to be drawn up, which will be presented to the University Council in June in order that they can make recommendations based upon it. The summarized assessments of the research groups form the basis for the deans and directors of research to flesh out the details of scenarios for the research groups for creating a research landscape that does justice to the University of Twente's profile and which allows us to raise our national and international profile to even greater heights.

The assessment of the groups is based on the quality of both fundamental and valorizing research. It should be pointed out that in practice, there is often a correlation between fundamental and valorization research: groups that are good at fundamental research often achieve significant successes in valorization. As far as the link with teaching is concerned, Chairs possess expertise, and a healthy interrelationship with research is particularly important for Master's level teaching. This expertise is crucial during the independent inspections of our teaching. This will also be looked at when the research groups are restructured.

The assessments of the excellence and nature of the groups have shown the following variations:

- A positive assessment has been given to groups that are good at both fundamental and valorizing research.
- In the case of groups that are only good at fundamental research, their relevance to UT themes and institute research programmes is being looked at.
- For the groups with a heavy accent on valorization which have been assessed positively, the possibilities for structural collaboration with industrial or social partners (who are willing to provide financing) are being explored.

Groups which have not scored well in either fundamental or valorizing research have received a negative assessment.

However, it may well be the case that these groups are important for retaining a specific programme accreditation, for example because the programme is so large and is very much in keeping with the profile of the University of Twente. The scenarios that are developed for categories III and IV (as shown below) must provide solutions to the problems that exist – that does not always mean that the groups will be wound up, but it does mean that action of some kind has to be taken. In that case, there are three variants on how teaching can be organized:

1. For Bachelor's teaching, the way in which research is translated into teaching is relevant. If most of the research group activities are related to this, then it is sufficient to finance the group in question from teaching & research resources and research premiums.
2. If the research by a group is given a negative assessment, but the expertise of the group is sufficiently important for teaching, then the group may be transferred to or merged with another group, so that the teaching activities are assured by a redistribution of teaching capacity.

3. If the details of the scenarios make clear that the research activities of a specific group are important on account of the teaching element, then investments will have to be made in the group.
4. A final possibility is that investment in a group is stopped and the study programme discontinued. However, this will require more arguments than a lack of teaching capacity or quality in the research activities. Examples that come to mind are problems in relation to the size of the programme, its relevance to the University of Twente profile, etc. Another option to be considered will be for the study programme to be provided by another university.

Based on the assessment of the excellence and the nature of the research groups, they are subdivided into a number of categories, namely:

I: means that the University of Twente is a suitable home for the Chair in terms of its quality and focus, and that it will be continued. It does not mean that nothing has to change, however. It may be that the way the Chair is embedded in the organization will have to be looked at.

II: means in principle that the Chair should be continued. However, attention should be paid to the Chairs in this category using scenario analyses, either because of their appositeness to the University of Twente profile (focus) or because of their valorization potential. It should be stated how such considerations are to be dealt with in the scenarios.

III: means that the Chair does not meet the requirements. A decision will have to be taken to determine the extent to which it can be modified in order to continue to exist.

IV: means that the Chair in question does not meet the set requirements, and that drastic action will be needed if the Chair is to continue to exist.

V: means there are already plans to abolish the Chair in question (perhaps for reasons other than those relating to quality, such as the retirement of a professor and little likelihood of finding a successor of a similar calibre).

IMPACT and IBR research institutes

A proposal has already been put forward for abolishing the IMPACT and IBR research institutes as organizational units in due course, and to transfer the research activities that currently take place there to elsewhere in the University of Twente, in a manner yet to be decided. This is in spite of the fact that in recent years, both institutes have successfully pursued lines of research that are very much in keeping with the profile of the University of Twente. However, the lines of research of the groups at IMPACT vary so widely that it is difficult to reach any level of cohesion in the institute. There are no scenarios whereby any kind of cohesion could be created with this combination of research groups in the future.

The question that has been hanging over IBR in recent years is whether there is sufficient space for an individual institute of this kind. The Executive Board and the UMT have been looking critically at this question for the past two years, and they have concluded that there is not enough evidence to support its continued existence as an independent institute.

It is proposed that the IMPACT and IBR groups be repositioned in the most appropriate environment. They can be moved to either one of the other institutes or one of the faculties.

The strong research groups at IMPACT and IBR will not lose their resources when they relocate to another institute or faculty, and they will retain sufficient resources in order to make the link between research and teaching.

Scenarios for organizing research

Based on the aforementioned starting points, the deans and directors of research have been developing scenarios for each research group. The emphasis lies on focusing research within more

restrictive financial parameters as a result of a fall in financial support from the central government. The amount by which government funding will fall is not yet known. Nevertheless, it has been decided that the organization will cut expenditure to the tune of 15 million euros from the year 2012, of which 7 million will come from research and faculty support services. It is intended that as much of this money as possible will be reinvested in top-level research at the University of Twente.

Attention was paid to the following aspects when the scenarios for the current research groups were being drawn up:

- The internal and external options for the research group:
 - relocation to/merger with one of the other research groups;
 - relocation to a faculty;
 - relocation to another institution;
 - abolition, or phasing out;
 - other scenarios;
- valorization potential of research group;
- the consequences for permanent staff, both academic staff and administrative and support staff;
- the financial consequences of each scenario;
- the period of time within which scenarios can be achieved.
- In the case of numerous alternative scenarios for each group, a total assessment for each scenario.

It is noted that although a number of groups (who together form a distinct research cluster) meet the set criteria, they do not fit in neatly with the MIRA, MESA+, IGS or CTIT institutes. More scenarios are being drawn up for the future embedding of these research clusters (such as Biomass).

The research group scenarios are being included in a reorganization plan that is to be put before the University of Twente employee representative body (the University Council) in June 2011.

5.2 Repositioning and structuring of valorization

This section sets out the vision in relation to the support for valorizing research.

The strategic decision for greater differentiation between fundamental and valorizing research has resulted in fundamental and valorizing groups being embedded in the organization in different ways. Fundamental groups are being positioned in institutes and valorizing groups in the faculties. In addition, the groups are financed differently. Fundamental research groups receive a relatively higher contribution from government funding than do the valorizing groups. The idea behind this is that the valorizing groups are able to attract more commercial funding, and some have already been very successful in doing so. Among some groups there is the potential for greater valorization, but in order for them to achieve greater success in this area it is likely that they need targeted support.

Valorization support can be aimed at individual Chairs that fall outside institutes and at clusters of Chairs that are located in different units. This refers to support in the following areas in particular:

- Exploring external developments (including international ones);
- Promoting and initiating internal collaboration;
- Initiating and structuring external collaboration with industrial and social parties;
- Obtaining extra finance from regional, provincial, national and European funds;
- PR, communication and exposure in relation to the relevant research fields.

Commercial and financial responsibility rests in principle with the departments themselves, as does the consideration of whether support is actually needed and in what form. Demand (from the Chairs) formulates supply, not the other way round.

Support in this area already exists at the University of Twente, albeit in a fragmented form, across various units (Strategy & Communication, Financial and Economic Affairs, Kennispark, Unit Secretary, Business Directors of the institutes). With a view to providing the best possible support for the valorizing activities of groups outside and inside the university, this expertise should be made more easily available, and expanded or strengthened where necessary. Various models on how to approach and organize this could be devised. These will be developed and assessed in the near future. Naturally we will be bearing in mind the outcome of the restructuring of the research landscape, the strategic fit with the University of Twente profile, and the plans of the faculties with regard to the structural and substantial increase and optimization of commercial funding.

6. STRATEGIC CHOICES FOR EDUCATION

The outlines of a vision for education are set out in the RoUTe'14 Strategic Vision, and have been worked out in greater detail in the *Instellingskwaliteitszorg* (institution quality assurance) memorandum. The vision can be summarized as follows:

- We see the students as partners, with a major responsibility for their own education;
- We offer students high-quality education, with room for their own individual needs and wishes;
- Students become proficient in researching, designing and organizing, coming into contact with technological, natural, social, business and behavioural sciences;
- The structure is designed so that students can find out as quickly as possible where they belong;
- Students are encouraged to develop an entrepreneurial outlook and to be actively involved in their environment;
- The campus plays an important part in the learning experience of the students.

This vision for education is prompted by a conviction about what we should be sharing with our students in order for them to succeed in a fast-changing and highly technological global environment. It is not just about a solid theoretical basis in a particular discipline or set of disciplines, but also about the skills in applying the principles that students learn along the way to other fields. These 'transferable skills' have permanent value in an environment where knowledge quickly becomes out of date.

The University of Twente has a wide range of high-quality degree programmes. However, in teaching terms we are a small player when compared with other universities. Our courses are also characterized by high drop-out levels and slow progress on the part of the students. We can and would like to change this situation. Examples from both inside and outside the Netherlands show that reshaping study programmes can lead to drastic improvements in their appeal, quality and pass rates. This is what we are seeking to achieve, in part because of the obligation imposed on us as an institute of higher education by society. We lose too many students before they have completed their degree programme, while the students who stay often need too much time in order to obtain their degrees. As an institution, we are under a great deal of pressure to perform significantly better when it comes to curbing drop-out rates and improving pass rates.

Students are feeling the same pressure. We have to provide a range of courses for them that enable them to get the best out of themselves without the risk of their falling behind without good reason. If we cannot offer them that, then they will in due course choose not to study here, and quite rightly.

The political and social debate is not just about the performance of individual institutions of higher education but also, since the publication of the Veerman Committee report (on making the system of higher education ready for the future), about the structure of the existing order. One of the conclusions that has been broadly embraced is that institutions should raise their profiles if they want to prove their added value. Because of its unique set of disciplines and amenities, our university is excellently placed to do so. However, these disciplines and amenities have to create mutual added value as well, including in teaching, and programmes like Health Sciences, Industrial Engineering and Management or Biomedical Technology are precisely the kind that present that opportunity. But we want to create added value in other areas too, in the sciences and social sciences.

We are committed to designing education of and for the future. It has to be clearly different to what else is on offer elsewhere in the Netherlands in order to reignite the interest of the people that matter.

6.1. Education model, Bachelor's portfolio

Our ideas about the configuration of the education building have not changed. It has three levels, for Bachelor's courses, Master's courses and PhD education.

The Bachelor's programmes, as the first level, provide a basic academic qualification in a particular field, and are efficient routes towards the Master's programmes. The Bachelor's programmes and Master's programmes are not constructed vertically, pillar-fashion.

Bachelor's students can choose their options according to those available in the Master's programmes - the second level of our education building. Bachelor's programmes are not primarily designed for students to enter the market, but this is possible through special minor programmes such as the educational minor. The Master's is a high-level employment market qualification.

Students wishing to progress further can move on to the third level, where those with a talent for research can embark on a PhD programme. There is a design programme for students with a talent for design, while those with an aptitude for organization have the option of a PhD-level programme in business and public administration. Students considering studying at this level must decide which direction they wish to proceed in while studying for their Master's.

Teaching model

In order to achieve our mission, the teaching of Bachelor's will have to be structured in a different, more effective manner. By effective, we mean teaching that succeeds in reaching a high standard quickly, and with low drop-out rates.

There is general agreement about the ingredients¹ of effective teaching. They can be easily summarized as follows, in no particular order:

1. Reciprocity between students: learning from and with each other is a particularly effective way for students to learn, especially if they are dependent on each other.
2. Active teaching methods: reading is better than listening - discussing and applying knowledge yourself helps it stick better and helps test whether it has been fully understood.
3. Continuous effort: absorbing a lot of knowledge in a short space of time, followed by periods of low levels of activity, is not effective.
4. Accommodating differences in interests and teaching styles: different types of teaching and optional subjects in the curricula reduce the likelihood of students dropping out.
5. Regular and fast feedback: acquisition of knowledge should be followed by confirmation that it has been properly understood.
6. Community: identification with an academic community (fellow students and staff) translates to intrinsic motivation.
7. Explicitly stating high expectations. It is not always obvious to students that they are expected to achieve.

We have chosen the following design guidelines for structuring teaching, based on the above ingredients:

Modular teaching model: we are committed to designing a Twente teaching model that combines as many of these ingredients as possible. We believe we have found such a model in what we refer to as the modular teaching model.

Modules of equal size: the curricula are made up of modules of equal size. They all last the same amount of time, and the study workload for each is identical. This creates maximum flexibility for

¹ The principles of effective teaching, articulated and clustered in different forms, feature in a large body of literature. For example, see <http://www.studiesuccessho.nl/> for an introduction.

students when putting their own study programme together. A secondary reason is that such uniformity has significant administrative benefits, which are reflected in lower support service costs.

Separate subjects per module: more than one subject is given in one module, either in parallel or sequentially. The subjects may be given full-time for the first two weeks, for example, after which a number of other subjects are taught in parallel. The resultant flexibility has significant educational added value.

Project-based teaching: the module also consists of a component that we refer to as the 'project', in which students integrate the course material, test their understanding and find new questions to ask. UT has gained useful experience of forms of project-based teaching in several courses.

Modules derive their coherence from a binding theme, which also has a genuine binding effect in the project. In addition, modules have a beginning and an end. If a theoretical aspect forms part of a module, then the aim should be to teach it in its entirety – in other words, not one half now and the remainder in the next module. This would mean modules having to be given in a particular sequence and remove the dynamics of the system.

Our model assumes several test moments in each module. This may take the form of group assessments (in part) for the projects, while individual assessments would be used for the various subjects. We will have to find methods of testing that do not take up too much of the staff's energies. The results of the tests should be available quickly if the tests are to have an impact on students' progress.

The core components of this model are the integration of effective classical teaching that can be timetabled with reciprocal types of project and a structure that allows scope for optional subjects. This is in addition to the elements involving continuous efforts on the part of the students and regular feedback from several test moments.

Of the list of components for effective education that we have given above, there are two that cannot be covered by this model. These are the community and the culture of high expectations.

Nevertheless, both are highly relevant. We are investigating how these elements might also be integrated into the Twente teaching model, by looking at the form and content of the introductory period and how campus activism relates to teaching. The University College will also play an important part in this investigation.

Bachelor's portfolio

Many of the students who drop out from our Bachelor's programmes do so as a result of their having chosen the wrong course or due to a gradual realization of where their own talents and interests actually lie. The curricula we currently offer make little allowance for this aspect.

Students appear to understand that choosing a preset curriculum has its risks, or they simply find it a less attractive proposition. In any case, we have noted that the science courses which are growing are primarily those that provide scope for optional subjects and for combining disciplines.

The matrix of 20 study programmes does not offer the room we need in order to allow the modular model to truly come into its own. This is an important consideration in deciding to take a critical look at the portfolio. Another advantage of organizing things differently is that a greater level of commonality can be achieved in the courses available, which means that teaching can be organized more efficiently. The current portfolio has clear similarities in the curricula at subject level. Curricula are needed that are attractive to prospective students and which have a clear internal consistency. Finally, it is greatly important that the standard of the programmes is recognized and acknowledged by professional groups and follow-up study programmes both in and outside the Netherlands.

A Bachelor's programme serves two primary goals: it is a basic academic programme and an interface between secondary education and Master's programmes. A move into the employment market is an option, which can be explicitly exercised with an educational minor, for example. Bachelor's students preparing for their Master's are not obliged to take their Master's at our university. Nevertheless, it should be possible for most of the intake for UT Master's programmes to come from our own Bachelor's programmes.

Looking at the portfolio of our university from the above perspective, we arrive at the following clusters, based on the linking of disciplines. Their provisional working titles are Science & Technology, Biomedical Engineering, Engineering Technology, ICT, Design Engineering, Psychology, Communication, Business Administration, and Public Administration.

We have omitted the Technical Medicine programme from this operation while the BIG (Individual Healthcare Professions Act) recognition procedure is still proceeding. Once this has been clarified, then TM can be assessed to see whether and how it can be accommodated into the modular model. An additional complicating factor here is that Technical Medicine is the only six-year programme in the portfolio.

We are still considering the definitive list of programmes and the number of entry courses. It is not impossible that the detailed version of the teaching model will feature a different study landscape configuration, with perhaps three or five entry courses instead of the nine mentioned above, because developments surrounding Bachelor's teaching and the associated preconditions may have become clearer by then. It could also be because of future information relating to the accreditation of programmes, for example, or the scope we wish to retain for substantive and expert contributions from the University of Twente community in this area. The starting point here is that there should be a clear educational front, with which the University of Twente can position itself in the market flexibly, and with which the High Tech and Human Touch profile can be prominently highlighted. In order to arrive at such a cluster of programmes, some of the details of the aforementioned nine clusters should first be worked out. This will raise a number of issues, which will affect the eventual composition of the Bachelor's portfolio. When the Bachelor's portfolio is composed, it should result in the same level of efficiency as that envisaged in this document, with fewer Bachelor's programmes, more optional subjects for students and fewer gaps between disciplines. The definitive composition of the Bachelor's portfolio will be put before the University Council as a supplement to the current document at a later stage.

The new Bachelor's programmes, the final structure of which has yet to be determined, are the common front doors for a cluster of programmes with the status of major. Most existing programmes will be retained, but as majors. However, there will also be room for new majors in the clusters. An important aspect of this is marketing and communicating the programmes. The details of the form this takes is outside the scope of this strategy document. It will follow in the Bachelor's education memorandum.

6.2 Master's education

Work is now also underway at positioning and improving the quality of Master's teaching.

In 2010, the PKM (positioning and improvements to the quality of Master's teaching) project group was set up. This is the successor to the RoUTE'14 'Schools' project group, and deals with the positioning

and quality of the University of Twente's Master's programmes. The PKM project group consists of the directors of education from all six faculties, and is chaired by a dean.

Improvement activities are planned for six separate areas, about which extensive discussions are being, or are due to be, held with every UT director of education:

- (1) Safeguarding the academic character of Master's programmes.
- (2) Upholding the University of Twente identity for Master's programmes, based on the 3O (research, design, organize) concept, engineering and entrepreneurship.
- (3) Creating an international learning environment for Master's students.
- (4) Introducing UT-specific quality entry requirements for Master's programmes.
- (5) Constructing excellence tracks for UT Master's students.
- (6) Facilitating transfer to follow-up courses and to the employment market.

The implementation phase begins in 2011.

The six areas are the starting points for the improvement activities.

PKM is looking at the safeguarding of the quality of the Master's courses. The areas for attention are the quality of the intake, the development of a well-functioning international learning environment and its relevance to the employment market. The link with research at UT is essential for safeguarding the academic character of the Master's programmes (area (1)).

Changes in the Master's courses will not be as far-reaching as those in the Bachelor's programmes. The emphasis will be on safeguarding the academic character of the Master's programmes and the implementation of the 3O concept (see area (2), above). The 3 O's (research, design, organize – which all begin with the letter 'O' in Dutch) are a planning mechanism for Master's courses, for the purpose of making advance choices in relation to PhD-level programmes, and with a view to developing honours tracks.

One educational innovation that is being examined is the UT-wide multidisciplinary '3O Master's assignments', on the basis of which students can graduate jointly. Partnerships with private and public parties are being explicitly sought for this purpose.

For the creation of an international learning environment for Master's students (area (3)), the PKM is making extensive use of the expertise in the ITC faculty. There are wide variations in the level of internationalization between the different UT study programmes. There are context-neutral programmes such as Computer Science, whereas there are other programmes whose graduates have to be able to function in an international setting, for which they need specific communication and cultural skills. However, the national context of UT programmes should not be forgotten: students also come to the University of Twente in order to learn about Dutch practices.

From the discussions with the directors of education, it emerged that the quality entry requirements for Master's students (area (4)) should be about daring to make decisions about which students to admit, and which not. It is also important to remain committed to your good students.

The University of Twente also has plans for excellence tracks for Master's students. Excellence tracks are being developed for each of the three O's (see area (5)) – at Twente Graduate School for the first O (research); for the second O (design), as a stepping stone to two-year postgraduate programmes; and for the third O (organization), as a stepping-stone to a Professional Doctorate of Business Administration follow-up programme, for example.

In 2010, the University of Twente worked out the details of a programme proposal for the second O, which was submitted in order to obtain resources from the Sirius Programme. The excellence track proposal consisted of an extracurricular programme worth 15 ECTS credits. Part of the excellence track included a 10-credit individual track featuring a master-apprentice relationship involving a leading designer, where the student would come up with an academic product (such as a contribution to a conference about an academic design). Unfortunately, the Sirius proposal for this excellence track was not accepted, primarily because the assessment committee considered the costs per student to be excessive (mostly as a result of the extensive 1:1 master-apprentice working relationship). The PKM project group is looking at how excellence tracks (whether extracurricular or not) might still be accommodated in the University of Twente's Master's programmes.

In the case of area (6) – facilitating the transfer to follow-up courses and the employment market – a student should get a clear understanding of what he wants and where he wants to go. Is he a researcher or a designer, or perhaps an entrepreneurial organizer? The University of Twente provides context-related courses. The shrinking field indicates that it is precisely the people from Twente who know how it works.

The strategy being used by the PKM project group is that programmes are examined by a group of experts working to clearly defined terms of reference. This examination is to be the starting point for the discussion with the people responsible for the programmes. The terms of reference will of course be closely linked to the institutional quality assurance system (IKS).

The Educational Science & Technology and Biomedical Engineering Master's programmes will be the first to be examined, as part of a pilot scheme, in the spring of 2011. The content and procedures of the terms of reference will then be the subject of discussion before the summer in a PKM meeting with the directors of education. The other Master's programmes are due to be examined in the 2011/2012 academic year.

All UT Master's programmes are accredited. The starting point is that PKM is concerned with every UT Master's programme, including those of ITC, ELAN and the Post-Academic Education Department.

6.3 PhD stage education

The objectives formulated in RoUTE'14 in relation to the PhD stage of education, and for which the initial activities are already underway, have remained unchanged in the enhanced version of the strategy. With 15 programmes and over 150 PhD holders, the Twente Graduate School is one of the elements by which we can improve our international profile.

As already briefly mentioned in the previous section, we provide two-year post-graduate design programmes for outstanding students – for the time being, these are Civil Engineering, Energy & Process Technology and Robotics. It is intended that these programmes will start in September 2011. This means we offer continuous 'second O' courses for outstanding students. Demand from industry for highly qualified alumni who have taken a two-year design programme after their Master's is increasing. Businesses are only too pleased to take on PDEs with extra knowledge and experience who can be deployed straight away. The current design programmes will be moved to the 3TU School for Technological Design.

Our ambition in the field of professional learning is to develop learning tracks, including design programmes, which are primarily aimed at professionals and managers in private and public organizations. The aim is to recycle as much existing material as possible.

The following elements have been selected as starting points, for the purpose of developing our postgraduate education:

- Social relevance (rapid development of technology, globalization, ageing population – people have to constantly readapt in order to be able to participate in the knowledge society);
- Pooling of existing programmes (there is no clear overview (including for the outside world) of the current range of programmes, which both overlap and leave gaps);
- Network function (good for knowledge and contacts in the professional field, alumni, exchange of experiences).

We have offered our alumni, as well as other clients, additional courses for some time now. We are going to expand this, and organize it better.

Using professional learning, we offer courses varying from short tracks and summer programmes to fully-fledged degree programmes which can be taken on a part-time basis. These courses are based on those contained in the regular programmes and are of the same high quality. This is in response to a genuine social demand, and is a form of knowledge valorization, which also releases valuable knowledge and contacts into the professional field. For an entrepreneurial university, this activity has to be of economic benefit as well (commercial funding for education: extra source of income, compensation for reduction in direct financing from the government and possible consequences of the shrinking in the size of the full-time education market).

7. UNIVERSITY COLLEGE

UT intends to launch a University College (UC) in September 2012, for the purpose of teaching multi-faceted talented individuals who can contribute towards resolving the major issues in our high-tech society. In the process of finding these solutions, students have to be able to switch from one area to another: zooming in, zooming out, and altering their perspectives without considering disciplinary demarcation lines as obstacles. They have to regard technology and exact sciences not just as social phenomena; they also have to be able to understand and apply them to a high level. At the same time, they should see behavioural and social fields not just as areas of application, but also have a thorough understanding of the complex relationship between technological and social developments.

Within the permissible limits of the curriculum, students at the Twente UC will have to meet the admission criteria of the majority of Master's programmes in the exact and engineering sciences that exist at leading universities, and be eligible for admission to a significant number of Master's programmes elsewhere.

The renewal of science teaching will be one of the goals of the UC. The image of science and technology among students and parents is markedly less positive than the image that scientists have themselves. Tackling possible misconceptions has little effect in the short term. For the purpose of developing the UC, we have therefore decided to accept the discrepancy between the 'inside' and 'outside' world as a fact of life.

For the target group – talented and versatile science students and highly talented individuals who are not afraid of science – these courses will be unique in the Netherlands. Students will gain professional knowledge in various fields while applying that knowledge in the resolution of problems. This will allow students to practise research and design skills and to develop a solution-minded approach and the capacity to generalize and specify from the very beginning.

The Academy for Technology, Liberal Arts and Sciences (ATLAS) is being set up by the University of Twente in order to operate this programme. It is a University College of the kind that is catching on in the Netherlands; it provides liberal education in the American sense of education, whereby the personal development of the student is the most important aspect. By including 'Technology' in the name, it is clear that the programmes involve engineering (applied natural sciences, design).

Purpose, importance and distinctive capacity of the University College: the purpose of developing the University College (UC) is to create an appealing range of programmes for talented Bachelor's students with a wide range of interests. The UC will fulfil a pivotal role in putting the University of Twente on the map as an institution where the best students can develop using the full extent of their abilities. The UC will also offer the possibility of putting educational innovations like project-based teaching and the 3O concept into practice in a way that serves as an example to others, thereby contributing to the improvement in quality and the profile of UT Bachelor's programmes. In addition, there is a need in society for alumni with wider perspectives and other ambitions (such as leadership), while top-level students themselves are looking for more challenges (they are often held back by their group).

Twente is one of the peripheral regions in the Netherlands that is facing a shortage of highly qualified employees in its employment market. To an increasing degree, those with high-level qualifications are leaving peripheral areas in order to break into the employment markets in the centre of the Netherlands or the Randstad region. The result is a brain-drain situation. The business sector in Twente is feeling this and is experiencing more and more difficulty in filling the more demanding positions.

In fact, the problem is occurring at an earlier stage: students themselves are moving in large numbers to the Randstad area, returning only in dribs and drabs to strengthen the regional economy. It is therefore greatly important to the regional economy that the University of Twente is put on the map as a leading, modern and attractive education institution.

The UC will therefore be based in a part of the country that needs talented individuals, and will contribute towards resolving the problems that are specific to the region.

What will make the University College in Twente distinct from other University Colleges is that it will clearly highlight the profile of the University of Twente, High Tech Human Touch. The direct presence of sciences and social sciences on the campus means we are in a position to create a fully-fledged and distinct range of programmes at the cutting edge of these areas. There is only a limited number of programmes at the cutting edge of technology and society, and there is a lack of courses aimed at the most talented individuals, while in society there is an abundantly clear need for people who have taken 'different' programmes in the science sector. It is to meet these changing needs that the University College is being set up in the science domain at the University of Twente: a new technology, liberal arts and sciences programme.

Hidden science talent target group: six University Colleges have been established in the last decade in the Netherlands, with a 'liberal arts and sciences' signature. The proportion of their students

choosing a science programme is low. Nevertheless, there are many who could do so. The UC of the University of Twente will be aimed specifically at this hidden scientific talent: students who, in spite of having N&T (nature & technology) or N&G (nature & health) VWO ('pre-university education') profiles, do not opt for a science degree programme. The UC will also be aimed at a target group other than those on the broad-based Advanced Technology Bachelor's programme. Women are over-represented in this category.

Survey of levels of interest among the target group: in preparation for the setting up of the University College, the University of Twente has conducted a survey in the region among school deans, school pupils (the most talented) and parents of pupils on the one hand, and UT Bachelor's students (the most talented) who were taking part in the Honours Programme or the Excellence Stream on the other. The survey made clear that only a small proportion of the current range of Bachelor's programmes appealed to the pupils (and parents). Even for the most talented VWO students, there is still a high threshold as far as science degree programmes are concerned. We refer to this group as the hidden scientific talent.

However, those talented individuals who have opted to study science are very satisfied with their choice. Between 10% and 20% would have seriously considered a UC if one had been around at the time. In other words, there is a need for a new and distinctive range of programmes that appeal to the hidden scientific talent.

The existence of the target group is no guarantee that it will actually decide to take advantage of the new range. In order to identify the clinching arguments, an education expert carried out a survey of the target group and conducted interviews at various schools with representatives of the target group and their peers. He then constructed profiles of the target group, their opinions and their misgivings in relation to science. This input is relevant for both attracting students to the programme and deciding what to put in it.

The initial responses by the school heads to the UC initiative were positive: it was recognized that there is a big gap between the most talented students and other 'good' students in terms of aptitude and interest and ambition. Reference was also made to the fact that most of the hidden scientific talent can be found among female pupils, and that care needs to be taken about how UC is presented if their interest is to be aroused. What the difference appears to amount to is that 'boys are more interested in the technology itself (how it works, what can I use it for)', while 'girls wonder more about how they can contribute to a situation or a problem'. The treatment and resolution of social issues in the UC, plus the fact that the disciplinary approach that features in regular Bachelor's programmes will not be included, will be more appealing to girls with an aptitude for technology than a pure science programme, according to the interest survey.

In the opinion of the school heads and of colleagues from other UCs, there is a large group of hidden science talent, only a limited proportion of which is persuaded to cross the science 'threshold' via the range of existing 'liberal arts and sciences' programmes in the Netherlands. The thematic structure of the UC of the University of Twente appeals to the school heads, while the pupils are also showing interest. Specifically, the areas of interest they mention are 'sport and movement', 'liveability', 'leisure' and 'alternative energy'. Additionally, they consider it important that the programmes will be in English and for an international student community.

Multi-faceted and highly talented individuals: as well offering an attractive range of programmes for its target group, the UC will have the function of putting the University of Twente on the map as an institute for the most outstanding students. The UC should be the institution of choice for multi-faceted and highly talented individuals. UC students opt for high-level programmes that open doors to the world's most prestigious Master's programmes, and they choose a UC because of the challenging learning environments with like-minded students, the international orientation (a group of people from different backgrounds and a study programme taught in English) and, unlike existing University of Twente programmes, the influence they have over the course of the programme (personal development).

Talented students who are interested in greater depth in a smaller field should look for attractive alternatives elsewhere. However, both groups may cross each other's paths in multidisciplinary project teams, in specific in-depth programmes like the excellence stream, and when working in depth on any of the three O's. The content of the existing Honours Programme could serve as an example for the O for researcher.

Programme: the UC programme is being devised, with the starting point being the University of Twente approach to 'engineering' that is directed at major social issues. Society's problems have to be resolved with the help of technical knowledge and understanding of technology, human motives and society's processes. Every UC alumnus will be able to gain immediate entry to at least one technical Master's programme.

The UC in Twente is creating its own distinct profile: inspired by global analyses of the development of knowledge economies and the role of the modern engineer in them, the programmes will really come into their own as the students graduating from them will have a broader range of competencies than the specialists graduating from the existing programmes. Because the programme will only be for top-level students, that breadth of knowledge will hardly affect the level of depth that will be achieved, albeit in a smaller field. As is the case with other University Colleges, the depth will be more illustrative – nevertheless, the programmes will clearly meet Bachelor's level requirements, as shown from the fact that UC alumni will be eligible for Master's programmes.

The UC is being set up by the five UT faculties, with the accent on engineering. Together, they will ensure that the University of Twente adage, 'High Tech, Human Touch', courses through the veins of the programmes.

A large part of the programmes consists of thematic project teaching, the heart of which involves contributing to a solution to major social issues. From the very beginning, behavioural and social science (philosophy, communication studies, psychology, public administration, industrial engineering and management, and business administration) perspectives play as important a role as do technical discipline perspectives. All these perspectives are represented on the Programme Council of the University College.

The UC Programme Council, which comprises various professors (of whom some have a Liberal Arts and Sciences background) and a lecturer, are working on the outlines of the programmes.

Selection: the UC will select the students on the basis of their aptitude, suitability for the type of programme and their motivation. The courses will be contact-intensive, and assessments will be designed for providing feedback and support, and are not related to matters of selection. No exam retakes will be scheduled and everyone, in principle, will complete the programme within the official duration of it.

Community building: experiences elsewhere have shown that because UCs do not have fixed programmes for everyone, they require elements that enhance their identities. The formation of a UC community is considered crucial in order to prevent the relative lack of urgency associated with other programmes affecting the study activities of the UC students to too great a degree. Curricular and extracurricular activities help form a community, and it is essential that they remain in close contact in their living environment too.

Exchange of students: we want the University of Twente to portray the idea that students who decide to take their follow-up courses elsewhere, whether in the science, social science or other academic field, are not regarded as 'lost'. UC alumni from the University of Twente, who are admitted to leading institutions elsewhere, strengthen the reputation of the University of Twente. To magnify this effect, it is important that study programmes involve student exchanges with top-ranking institutions, whether in or outside the Netherlands.

A detailed UC programme will be put to the University Council separately. The 'overall effectiveness test' process will advance during the participation cycle.

8. VISION ON THE DEVELOPMENT OF SUPPORT SERVICES

This chapter deals with the effect of the enhanced strategy on the organization of support services in the future.

8.1 Analysis of the core tasks of the support services

UT is seeking further quality improvements and a strengthening of its profile through RoUTe'14+, within the newly existing circumstances. The choices being made in relation to teaching and research are leading to a restructuring of our primary process. Excellent teaching and research demand and deserve excellent support services. In certain areas, this may place new requirements on the scale and organization of support services in order that the newly structured primary process can get the best possible support. For this reason, the structure of the support services will be carefully examined while the primary process is being restructured. Here, too, improvements in quality and efficiency will go hand-in-hand as much as possible.

In addition to the demands of the renewed primary process that are being placed on the scale and organization of the support services, we also face a short-term reduction objective as a result of the recent cuts in government funding. The consequences for central support services of the university-wide expenditure reduction target of €15 million in 2012 are twofold:

1. €3 million of the €15 million in savings will have to come from the central organization, support services, and budgets.
2. The €15 million savings will be spread across the University of Twente's teaching, research and central support service activities. It has been agreed with the faculties that a reduction in academic staff will be accompanied by a corresponding reduction among support staff. The guideline governing the ratio of academic staff to support staff, which is 60:40 at central level and 80:20 at decentralized level, will be upheld.

Support service developments in the short term

In the long term, the developments in relation to RoUTe'14+ will lead to fewer units and a different UT profile. This will also affect the scope of the support services and the way in which they are organized. However, before that stage is reached, there are a number of concrete activities that need to be carried out in the short term by the support services if the University of Twente's saving objectives are to be achieved.

Savings of €3 million must be found in the central budgets and by Directorates, the Unit Secretary, among others. In addition, the size of the support staff workforce has to be assessed in the light of the anticipated cuts in the WP workforce. This will include current change programmes such as EMB, the Berger Committee, the reorganization of Communications, the reorganization of Purchasing and the support staff. The reductions in staff numbers in these programmes that have already been anticipated, and the cuts in support staff at decentralized level as a result of the teaching and research spending cuts, will count towards the evaluation of the academic staff/support staff ratio.

The support services core task analysis project group will give more details in the June 2011 reorganization plan of how and where the €3 million savings objective for the University of Twente support services will be realized, from 2012:

- Directorate and Unit Secretary staff and budgets, among others;
- Central budgets. A critical look will be taken at areas like graduation support, catering and similar services. The costs of items of this kind will be compared with that of other institutions.

The guideline for the ratio of academic staff/support staff at central level and decentralized level will remain at 60:40 and 80:20 respectively.

The starting point for the support services savings objective of €3 million is that €1.5 million will be achieved through the cutbacks in the workforce of the Directorates, the Unit Secretary, the Facility Department and Library & Archives. This will be done as much as possible through natural wastage in order to avoid any compulsory redundancies. It is also proposed to impose a 1% reduction across all services. The remaining savings will be found by reorganizing certain amenities. It has been decided that the ICT and Student & Education Service Centres will not have to make any substantial cuts, as they are still bound by obligations from the past.

Support service developments in the long term

In the long term, the core task analysis project group will develop a vision with regard to the organization of UT's support services, based on the new structure of the primary process and UT governance. We want to use this vision to make a distinction between main tasks and secondary tasks in the support services. The aim is to create a balanced support services portfolio in terms of quality and quantity for the benefit of the primary process and the University of Twente management and administrative processes. This support services portfolio must of course be compatible with the prevailing financial framework and with the guideline for the academic staff and support staff ratio.

The chief principles in the formation of the vision are:

- The desired ratio of academic staff and support staff at centralized and decentralized level;
- First-class (in terms of quality and quantity) customer-oriented support for the services that are required by law, necessity or by virtue of strategic considerations;
- Outsourced support services, where possible and desirable;
- Efficient and effective coordination and improvement mechanisms for periodically evaluating and modifying the range of support services.

This vision will be instrumental in the future development of the various support service units and amenities.

Governance

The choices that are made regarding the structure of our teaching and research may impose different requirements on how we organize ourselves into units and on our mutual responsibilities. Any decisions on this will only be taken after the future structure of our primary process is clear.

9. VISION FOR THE CAMPUS

The only true campus university in the Netherlands is located in Twente – that is the opinion of every student and employee at the University of Twente. Unfortunately though, very few people seem to know what exactly the significance of this is, or what it actually entails. For that reason, the role and the function of the campus were extensively discussed while the RoUTE'14 strategic vision was in preparation, and indeed in the period that followed. At the beginning of March 2009, the *Campusontwikkeling en Onderwijsfaciliteiten* (campus development and education facilities) working group brought out an implementation plan in the context of RoUTE'14, entitled *Verwondering, Verbinding en Ontmoeting. De campus van de Toekomst* (Fascination, Connection and Encounter. The campus of the Future).

This plan actually provides an answer to the question of the role and function of the campus. Work is currently underway on a vision document that is intended to make clear once and for all what the added value of the campus to the University of Twente is. The motto here is, 'success does not depend on the quality of the vision, but on the extent to which it is implemented'. The implementation plan, as well as RoUTE'14 and other relevant documents, proved very useful in the drawing up of the aforementioned vision.

In addition to the mission and the vision, the vision document also deals with the activities that relate to them. The question that is repeatedly asked here is, 'should the University of Twente carry out these activities itself or are there partners who could fulfil a meaningful role here?' From its beginnings as an innovative experiment in creating a new model for higher education and research in technical sciences, the University of Twente has evolved in the last 50 years to the point that we can no longer claim to be just an experiment, instead of which we want to make the work we carry out, both experimental and mature, visible to the outside world. This is why it can still be said that this innovative experiment continues onward, albeit from a different perspective.

It has already been mentioned that the significance of the campus has been specifically looked at, especially during the RoUTE'14 process. According to the University of Twente strategic vision, the campus is one of the crown jewels of the University of Twente. However, it has to be made useful, rather than functioning as a showpiece. If the university wants to attract international-level talent, the campus will have to play a major part in the process. This therefore means that the facilities of the only genuine campus university in the Netherlands that are required for excellence will have to be improved still further: optimal research and teaching facilities in the immediate vicinity of attractive residential, sport and leisure amenities, and with direct access to the economic infrastructure of the *Kennispark Twente* knowledge park.

The role that the campus can play for the University of Twente has been considered in various parts of the University of Twente strategic vision. This refers to the following statements:

- The campus as a field lab, an ideal testing and demonstration facility;
- The campus as a meeting place for students, employees and third parties;
- Making campus amenities easily accessible and available to all target groups;
- Better communications and coordination of activities;
- Sustainability as the main thread in campus policy and its implementation.

On the basis of the above, the aforementioned campus development and education facilities working group has formulated three core values, which have also been endorsed in the vision document. The core values for the campus should be 'fascination', 'connection' and 'encounter'.

The campus to be created along the lines of the vision should be enticing – to those seeking to study, live, work, do business, relax, meet and innovate there. The campus should be like a community, with a sense of security and where people can feel that they belong. It should be an environment with an open and international climate. It should be a creative, innovative and dynamic setting: a 'place to be'. It should be a place to meet, a showcase, a place to experiment. It should have a clear and recognizable identity that says, 'this is where it happens!'

The document about the development of the campus will be put before the University Council separately.

10. IMPLEMENTATION STARTING POINTS

Generally speaking, we at the University of Twente have a wide range of high-quality programmes and outstanding research activities. As a modern and enterprising university, we are known for our design-based approach to industry and on account of the creation of new and innovative businesses. We also provide eye-catching solutions to major social issues in such fields as energy shortages and sustainability, security and health.

We have stated in the previous chapters that, in spite of the good things we do, there are more opportunities for us to raise our profile through our expertise, nationally, but more especially internationally, and to further improve the quality of our teaching and research. This can be done on the one hand by organizing our teaching in a different way and on the other by applying a greater focus to our research landscape.

We realize that the ambitions stated in this document are far-reaching, not least because of the hastened implementation of some aspects. This also applies to the fact that the effectuation of these ambitions will place significant demands on our employees, at every level. The implementation programme will therefore be taking place in stages, both with regard to teaching and the restructuring of research activities. In the process, we are making use of the knowledge, skills and enthusiasm of our employees.

For example, the details of the Bachelor's programmes will be worked out by the relevant deans, supported by experts in the field, in order to create suitable curricula. We hope to launch our University College in September 2012, with one new Bachelor's programme as a pilot scheme. The pilot scheme will help us to gain experience and make any modifications as necessary, before rolling out programmes on a larger scale. The other programmes will then start in 2013.

This will mean that the administrative support services will have to process dual data streams for a number of years. The necessary assistance in relation to marketing the new programmes will also have to be sought, and we realize too that it will create an extra burden on those who do the teaching. The implementation of our ambitions will be closely monitored. Wherever necessary and possible, extra steps will be taken to alleviate the burden associated with the efforts required for that implementation process.

As far as research is concerned, we will have a better idea of what the landscape will look like before the summer of 2011. The choices that are made will affect the staff, and we will have a clearer picture of this in the autumn. This is not something we are treating lightly. We are conducting this process with the greatest possible care. After the decisions have been made, we expect to need at least twelve months to bring about most of the research restructuring work. With regard to the scenarios covering the abolition or phasing out of groups, we believe that this will occur as much as possible through natural wastage.

Regarding the support services, we will achieve the €3 million savings from 2012 in the Directorates and Unit Secretary, as well as from the central budgets. From 1 September, we will also be working on the development of a vision for the organization of support services, which we hope to have completed by 1 March 2012. A plan will then be devised by which the agreed vision can be implemented after 2012.

It will be clear that the developments in relation to the campus will be spread out over a longer period of time.

As far as the financing of our ambitions is concerned, we will be falling back on the reserves for the purpose of covering the transitional costs. Secondly, we will be seeking clarification about the government's spending cuts as soon as possible, which information will serve as a basis for determining which part of our financial resources will be used for renewing our teaching and research. A separate proposal dealing with this will be presented at the time.

Furthermore, a new funding model for teaching at the University of Twente will be prepared on the basis of the findings of the *Bedrijfseconomische Aspecten van het Onderwijs* (economic aspects of education activities) working group.

After this strategy memorandum, the details of how the plans are to be implemented and their organizational consequences will be worked out in a reorganization plan, which will be put to the University Council in June 2011, and considered for approval in the autumn of 2011.

11. FINANCIAL SECTION

This chapter deals with the cutbacks in government spending and the savings objective for the faculties. It gives a view of the costs that are expected to result from the teaching and research renewal process. Finally, it includes an outline of how the resources saved are to be invested in teaching and research at the University of Twente.

11.1 Consequences of government spending cuts

This section includes an estimate of the consequences of the government spending cuts and the increase in accommodation costs for the University of Twente.

Effects of government spending cuts and rise in accommodation costs in millions of euros

Efficiency reduction	3.5
Reduction in direct funding for research	4.0
Rise in accommodation costs	4.4
No more resources from Economic Structure Enhancement Fund	memorandum item
Estimated effect, overall	11.9

Since 2011, the student-related part of government support has been based on the funding of students according to the official duration of their course. Long-term students are those who have exceeded the official duration by more than twelve months. The Bachelor's and Master's phases each have an extension year. In the opinion of the Ministry, fewer long-term students means greater efficiency, so institutes of higher education are having their funding reduced because of this anticipated 'gain'. Because the long-term student rule has been postponed to 2013, the efficiency reduction will be imposed on the institutes a year later as well. The level of government spending cuts in education for 2013 will amount to €378 million, of which €178 will be made up from the increase in tuition fees for long-term students, and €200 million in the form of an efficiency reduction for the institutions. The exact division of these amounts between the universities (WO) and the universities of applied science (HBO), and between individual institutions, is not yet clear. Based on our percentage share in the education supplement of government funding, the reduction in spending on education at the University of Twente would amount to around €3.5 million.

As well as the reduction in education funding, the government intends to transfer €90 million of its research funding to the Netherlands Organization for Scientific Research and the STW foundation, from 2012. The universities will be able to 'earn back' this reduction via projects. A similar shift occurred with the 'Plasterk reduction', which cost the University of Twente a great deal of money in net terms (around €8 million). The consequences of this next reduction are difficult to estimate. On the basis of the Plasterk reduction, we reckon that the net effect of this new measure will be in the region of €4 million. The Ministry of Economic Affairs, Agriculture and Innovation has stated that some of the available innovation funding (€60 million) will be spent on technical infrastructure, leading sectors and STW. It is still unclear to what degree the University of Twente can acquire resources from this.

Finally, the Economic Structure Enhancement Fund (FSEF), which is used for knowledge development and research, is to disappear. Although this did not form part of the government's direct funding, the ending of the Fund could have enormous financial consequences for the future of the University of Twente. The FSEF was used for sustainable and large-scale investments and is one of the most important sources of funding for innovation and research. Our Nanolab, for example, is financed through the FSEF, as are many other projects. Much of the financing of research assistants through indirect or commercial funding projects originates from the FSEF. The loss of resources from the FSEF could mean the end of dozens of collaborative partnerships in the field of innovation and research and therefore the loss of jobs for young researchers. This would be a major academic haemorrhage.

Until 2011, the total accommodation costs were lower than the rates charged to the units. This benefit was added to the available resources using the University of Twente distribution model, so that it flowed back to the units. In 2010, the first new-build projects were completed. As a result, there are no more surpluses in the REH (reserve accommodation fund). The loss of the additional €4.4 will mean there are fewer resources to go round.

11.2 Savings objective

Based on the aforementioned estimated government cuts in funding and the effects of the higher accommodation costs, the Executive Board has decided that savings of €15 million should be made. In the light of the estimated cuts of around €12 million, this means that a sum of €3 million will remain for reinvesting in teaching and research:

Savings and cutbacks in millions of euros

Savings determined by the Executive Board	15
Estimated total effect of cutbacks	12

Remainder available for reinvestment 3

The savings will be made in the following areas:

- €5 million from education and faculty support services;
- €7 million from research and faculty support services;
- €3 million from support services and centrally budgeted tasks.

The way in which these savings will be achieved in these three areas will be described in more detail in the reorganization plan, which will be put before the University Council before the summer of 2011.

11.3 One-off costs

We make a distinction between two types of one-off costs: transitional costs and reorganizational costs.

To give an indication of the expected costs relating to the renewing of teaching, an outline framework is given below. More accurate estimates are not available at this time – they will be included in the Bachelor's education memorandum. There are two types of cost: those for developing the new teaching model, and the transitional costs for temporarily running two teaching models at the same time. Funds will also be needed for preparing teachers for the new teaching model.

Transitional costs

Apart from a few marginal costs for the dual provision (keeping support service systems going, and the increased level of complexity of timetabling in particular), most extra costs are the result of teaching students who have fallen behind in their studies. They are not allowed to proceed into the latter years of their courses, but they are entitled to receive tuition, which therefore has to be arranged as an addition. These costs are not easy to estimate, but a rough assessment of the extra tuition that is needed, in percentage terms, can be made:

2013 20%

2014 15%

2015 10%

2016 5%

It is thought that this leads to extra costs amounting to around €1.7million, which will gradually decrease before expiring in 2017. A more detailed calculation will follow in the reorganization plan.

The costs of training teaching staff for the new teaching model (such as competencies relating to multidisciplinary cooperation and project-based teaching) are as follows: a tutor-training course takes two to three days. Other training courses are not yet needed on a large scale (though some training courses for smaller groups are, such as academic counselling). In steady state, around 300 tutors will be needed by 2016, which means about 100 training courses a year. These are reckoned to cost about €600 each, making a total of €60,000.

Costs of new teaching model

In anticipation of the implementation of the new teaching model in 2013, a pilot programme using the new model will be launched in 2012. This means that the initial experiences and any teething troubles and the like can be modified where necessary before the entire portfolio is rolled out. For this reason, the Biomedical Technology (BMT) programme will be launched in 2012. The costs for developing the BMT pilot programme are expected to be between €300,000 and €400,000.

The costs for developing a completely renewed range of programmes and the teaching model are estimated at €250,000 per major and about €800,000 at UT level. This brings the total amount to €7.5 million.

The costs of investing in a University College (accommodation and devising an innovative programme, estimation of extra revenue and extra expenditure) will be put to the University Council at a later stage. From a financial point of view, the starting points for creating a UC are as follows:

- It is assumed that the contribution for the students will be higher. This amount may be greater than the statutory tuition fees.
- A structural contribution of no more than €0.5 million is acceptable for the UC.

Reorganization costs

The actual costs associated with the restructuring of the research groups will only become clear once the details of the scenarios have been worked out. This will feature in the reorganization plan.

Covering one-off costs

The one-off costs associated with the educational renewal and reorganization will be covered from the reserves, the USow budget and Executive Board incidental policy budgets. Part of the 3TU resources will also be used for this purpose.

A fund will be set up for transitional costs associated with the new teaching model and for costs relating to the abolition of certain research groups. The fund will be fed from our reserves and other incidental resources. Structural costs and investments will be covered as much as possible by structural resources. The details will be set out in a document; they fall beyond the scope of this strategy document.

11.4 Investments

The University of Twente expects to be able to tap into various financial sources in the near future, for the purpose of investing in teaching and research. They comprise on the one hand the expected resources from the savings that are to be made. In addition, the Veerman Committee has stated that those universities that successfully raise their profiles in the next few years will be able to count on a lifting of some of the funding reductions currently being imposed. The new provincial government agreement for the province of Overijssel suggests that the University of Twente can count on an investment boost from the province.

The financial sources are as follows:

- Yield from the savings of €15 million is around €3 million;
- 3TU resources (around 30% of €11 million): around €3;
- Redeployment based on Veerman: memorandum item
- Redeployment of NWO resources (infra, leading sectors, STW): memorandum item;
- Investment funding from the province of Overijssel: memorandum item;

We would like to use the investment funds as follows:

- General improvement in quality of top-level research in the institutes;
- Investment in Master's-related research wherever necessary for retaining the programme accreditation;
- University College;
- General improvement in the quality of the teaching.