



OULUN YLIOPISTO  
UNIVERSITY of OULU

**UNIVERSITY OF OULU**

**STRATEGY  
2010-2012**

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# 1 Operating environment

## 1.1. National and international trends and developments

The operating environment of Finnish universities is marked by rapid changes in science, education and innovation policies. Globalisation, concern over sustainable development, the aging of the population, as well as rapid technological development are increasingly impacting on decision-making concerning societal and economic issues.

Globalisation continues to intensify due to the opening-up of borders, increased information flow, and new developments in communication technology. There is growing interconnectedness between all actors in international networks. At the same time, these networks are in a constant state of flux, as members are forming new alliances in the quest for a better competitive position.

The international political agenda is increasingly being shaped by environmental concerns. Slowing down the speed of climate change requires a clear commitment to the common good of mankind, and willingness to implement measures to slow global warming. As natural resources are depleted, renewable energy sources take on new significance. In industry, the focus is more and more on material efficiency and clean production technologies. Sustainable, long-term solutions are gaining in importance.

Over the coming decades, the age structure of the Finnish population will change considerably. It is estimated that 30 years from now the share of over 65 year olds will have grown by 50 %, while the share of people over 80 will have doubled. These effects will not yet make themselves felt in the near future, however. For instance, up until 2012 the numbers of young people in the 16-21 age bracket will actually grow somewhat. The changing age structure will significantly affect society in many ways, with the availability of skilled labour as one of the most serious concerns.

Both businesses and people are increasingly mobile. Already today it is a challenge to retain Finnish firms targeting international growth markets. Asia, in particular, offers new markets and skilled labour at a cost far below employment costs in Finland. Inside the country, the larger cities and growth centres attract the young and those of working age, causing a corresponding loss and aging of the population in the countryside. The North and East of the country are the areas most affected by this trend.

Technology is developing at an ever faster rate. New findings and knowledge emerge continuously in fields such as information and communication technology, biotechnology, and nanotechnology, giving rise to new applications. At the same time, regional innovation ecosystems gain in importance, due to changes in the nature of innovation activities and the competitive environment. It is one of the aims of the Finnish national innovation policy to create, based on strategic content choices and regional strengths, a number of powerful regional innovation clusters that enjoy world-class operating conditions. Oulu, one of the fastest-growing cities in Finland, has emerged as a major centre of innovation thanks to the cooperation of

businesses, higher education institutions and research organisations. Thus, Oulu is in a good position to become one of these key clusters.

## **1.2 Higher education policy perspectives**

The Finnish university sector is faced with new challenges brought on by continuing internationalisation, the redistribution of work and production, and society's need to focus on innovation. In scientific research, the emphasis is on enhancing professionalism, collaboration and networking, and on creating bigger units and a competitive infrastructure. In a time of economic recession, the cost and productiveness of the public sector are more than ever subject to critical scrutiny. In this situation, one of the key priorities has to be the concentration of resources on areas critical to the development and profile of universities.

The Finnish government programme includes ambitious reform targets for science, education and innovation, including university reform, structural development of higher education, formulation of a national innovation strategy, reform of state research organisations, a national infrastructure policy, and the introduction of a four-tier career structure for researchers. These are complemented by the cross-cutting themes of internationalisation, and the strengthening of the funding base for research and innovation.

Following the new Universities Act, ensuring the prerequisites for success is more than ever the responsibility of the universities themselves. It is up to the individual university, through its own policy decisions, to formulate a comprehensive and inspiring staff policy, provide a creative and innovative research and learning environment, and achieve excellence in teaching and research. The universities are called upon to renew their management system in order to strengthen their strategic leadership and decision-making capabilities. The aim is for universities to grow in strength and vitality by actively anticipating, influencing and exploiting the opportunities offered by their operating environment.

The reform of the university sector, with its mergers, alliances and fundraising drives, is bringing changes to the previously unified university landscape. The purpose of the reforms is both to intensify cooperation and clarify the division of labour between individual universities, in order to raise the quality of research and enhance the universities' appeal. This, however, leads to increased competition for resources between universities, which may cause inequality and thus weaken the basis for collaboration at the national level.

New indicators for operational quality and effectiveness are coming into use alongside existing efficiency and productivity targets as measures of a university's performance. International comparison of European higher education institutions, along the lines of the Pisa study, will be made easier through benchmarking, auditing, accreditation of programmes, and the development of methods to evaluate learning outcomes.

The deepening and widening of cooperation at the European level is increasingly affecting also scientific research. The global competitive position of top European research is being strengthened through the strategic development of the European Research Area (ERA) and the European Research Council (ERC). Asian nations are

also investing heavily in scientific research and the infrastructure needed for it. This means increasing competition worldwide for researchers, especially the most talented among them, causing fundamental changes in patterns of academic mobility.

Finland has been actively implementing the so-called Bologna process to develop the European Higher Education Area (EHEA). There is growing mobility among staff and students, and the internationalisation of education is continuing apace. The Finnish government has created new opportunities for educational export by granting a trial period during which fees may be charged to students from outside the EU/EEA for studies at Finnish universities.<sup>1</sup> At the same time, the emphasis on competencies as a measure of success in teaching poses new challenges to university teachers in terms of pedagogical skills and workload.

Developing the Finnish degree structure is made more challenging by the harmonisation of European higher education, the rapid changes in the requirements of working life, the need for life-long learning, and the pressure to develop new skills mixes. In a world dominated by brands and images, there is increasing tension between preserving what is, and the need for change. Higher education institutions, too, have to be able to commercialise their competencies in order to differentiate themselves from their competitors.

## **2 The University in 2010**

In its 50 years of operation, the University of Oulu, which at its founding was the northernmost university worldwide, has developed from a small and modest seat of learning whose departments were scattered all over town into a research and innovation university with a distinctly international outlook. Today, three different institutions can be said to function within the University: a traditional, broad-based multi-discipline university, a University of Technology, and a School of Economics. The teaching remit of the University is unusually wide by Finnish standards, including 8 disciplines, 45 degree programmes leading to a Master's, and 70 majors. The University boasts top-level international expertise and innovative research in such diverse fields as intelligent radio networks and information systems, robotics, optoelectronics, imaging, data security, material technology, bioprocess technology, and collagen research.

In March of 1972, the foundation stone for the Linnanmaa campus was laid; since then, the size of the student body and staff has tripled. At the end of 2009, the University counted 15 000 students and 3000 staff.

Over the years, the University of Oulu has created an attractive, multi-disciplinary technology campus that has been of key significance for the development of the Oulu region and the northern part of Finland. There are 18 000 high-tech jobs in the region; as early as 1982, the Oulu Technology Park started operating, the first in the Nordic countries. The Oulu model has been emulated in other locations around the world, and has provided the blueprint for the design of Finnish national competence centres.

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<sup>1</sup> In Finland, university education is free of charge.

The innovation quotient of the Oulu region, i.e., per capita investment in research and development, is the highest in Europe. In the period 2000-2009, around 40 companies were created as spin-offs from research, and the local population is one of the most highly-educated by European standards. The importance of the University for the growth and attractiveness of the City cannot be overestimated; many young people from the North of Finland settle in Oulu after leaving home.

The University of Oulu pioneered strategic planning at Finnish universities, being the first to define focus areas in research in 1994. In the Academic Ranking of World Universities (ARWU) by Shanghai Jiao Tong University, the University of Oulu placed second among Finnish universities, with the University of Helsinki coming first and on the University of Turku sharing second rank with Oulu. According to an international evaluation carried out in the autumn of 2007, the research activities of the University are of a high standard. In fact, some research groups, as well as some individual researchers, are at the forefront of their field internationally. Nevertheless, the University's research performance is not commensurate with its role and position among Finnish universities. Thus, the University still lags behind key competitors in the number of Centres of Excellence awards and the international publishing activity of its researchers, although it succeeded to improve its position in 2009 with regard to research funds granted by the Academy of Finland.

The University of Oulu has played an important role nationally and internationally in efforts to develop academic education and teaching. The University obtained good results in the international evaluation carried out by the Finnish Higher Education Evaluation Council; in the most recent evaluation round, two out of the ten Educational Centres of Excellence chosen by the Council were units of the University of Oulu. The University has also significantly improved its performance in terms of Bachelor's and Master's degrees completed. Further improvement is needed, however, in terms of productivity and standards as well as in the recruitment of international students.

The position of Oulu as a regional centre of development is clearly reflected in the student intake: more than 70 % of entrants indicate that their reason for choosing Oulu University was its geographical proximity. Oulu did well in a 2008 survey of Finnish university towns, in which respondents living locally and using the town's services were asked to rate the quality of their study environment. However, in a survey asking young people nationally to rate the desirability of different university locations, Oulu placed only 15th. Statistics for 2009 show that while the University's key competitors experienced an increase of over 20 % in applications, the increase in the number of applicants to the University of Oulu was only 8,4 %.

The majority of students graduating from Oulu University find employment in the Oulu area or the neighbouring regions, mainly with public sector organisations and large firms employing over 250 staff. It is an issue of grave concern that academic unemployment has been rising in precisely those regions that Oulu graduates have traditionally moved to (Northern Ostrobothnia – Kainuu – Lapland).

All in all, there can be no doubt about the University's significance in raising the level of education and welfare of the population in northern Finland. At the same time, the

growing speed of social, ecological and global change is challenging the University to further enhance the quality of its research and teaching.

### **3 Mission, profile, areas of strength and areas of development**

#### **3.1. Mission**

The University's mission is

- to promote internationally competitive independent research, education and culture,
- to strengthen the competencies contributing to greater wellbeing, and
- to ensure the availability of highly-educated personnel and research staff in the region served by the University.

#### **3.2 Profile**

##### **The University of Oulu – Research and innovations from humans and culture to science and technology**

The University of Oulu

- is a northern, multi-disciplinary research and innovation university that following restructuring is taking its place as an internationally top-ranked science university
- is working to strengthen the connection of academic education to research and to the University's designated focus areas
- maintains an international focus in all its operations
- is cooperating with the business community and other research institutes
- is a key player in the alliance coordinating innovation activities at the regional level.

In addition, the University has special responsibility for research and education in the Sami language and culture.

#### **3.3 Focus and development areas**

The University's designated focus areas and areas of development will be reviewed in order to achieve a clear overall structure. Focus areas are characterised by well-established, wide-ranging research activities and elaborated research structures and networks. Development areas, on the other hand, are more narrowly-defined, emerging fields of study whose research profiles and structures are still in the process of being formulated. For both, the University has defined specific targets of scientific interest, in which research effort will be concentrated. In this way, the University aims to develop internationally significant research programmes that leverage the synergy between research groups. Research and education in the focus and development areas is taken forward through broad-based multidisciplinary

research institutes, more narrowly-focused research centres and networks, and international Master's and postgraduate programmes. Local research infrastructures serving focus and development areas may be part of national or international networked infrastructures. Research is supported by strategic partnerships, both locally and internationally. In formulating its research programme, the University closely follows significant new national and international initiatives and programmes, such as the Laguna-project and developments in nuclear energy.

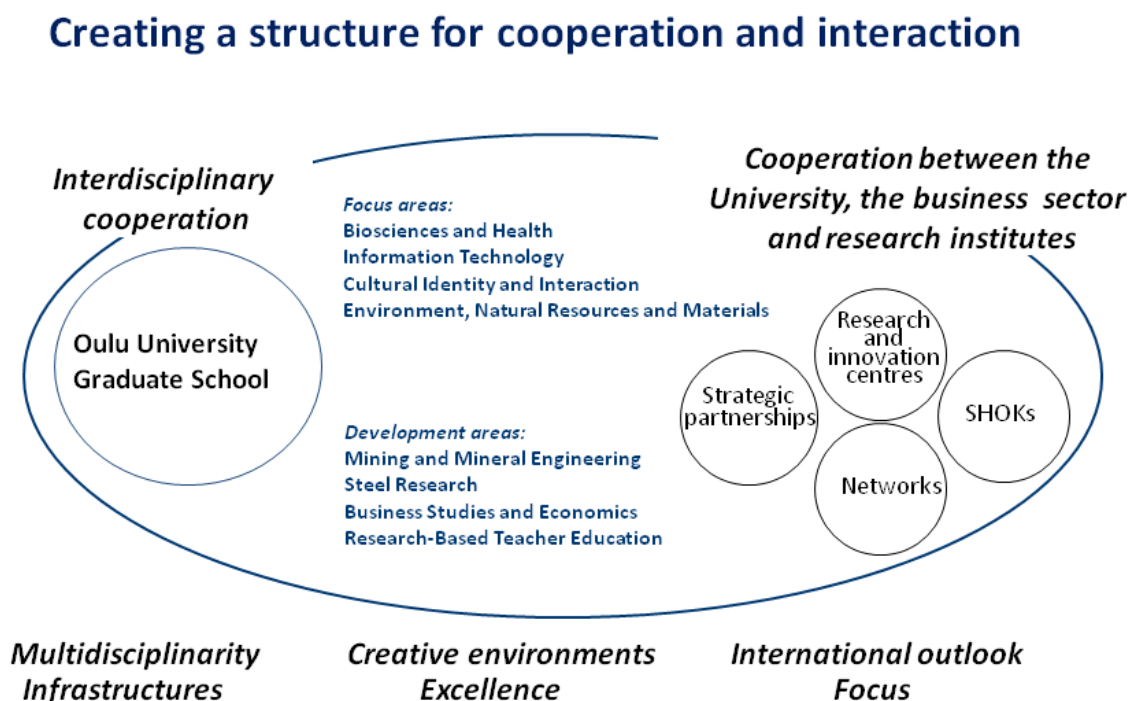
The University of Oulu concentrates on the following areas of strength (focus areas):

- biosciences and health
- information technology
- cultural identity and interaction
- environment, natural resources and materials, including the development areas of
  - o steel research,
  - o mining and mineral engineering

In addition, the University is aiming to strengthen its research profile in the following development areas:

- business administration and economics
- research-based teacher training

FIGURE 1. The University's new structure and environment



## 4 Vision: The University in 2020

*In 2020, the University of Oulu is a successful and attractive northern science university.*

### **In particular, the University of Oulu**

- has a clear scientific profile and is among the top research universities worldwide in its designated areas of strength,
- offers an education that evolves in step with advances in research
- is providing teaching for its degree programmes centrally at the main campus
- is part of strong networks nationally and internationally
- encourages innovation
- offers an inspiring environment to its staff
- operates from a strong financial base

## 5 Guiding principles

The University of Oulu as a community of scientists is committed to the principles of scientific inquiry and generally accepted standards of academic conduct. In addition, it adheres to the principles set out below.

### **Community**

A lively and frank communication culture, openness and mutual respect are the cornerstones of the University's success. We invest in our students and in our staff so that they can realise their full potential as part of the academic community. Success is valued and rewarded. We seek new ways of encouraging and deepening communication and cooperation between disciplines. We emphasize the link between research and education, which means that all research staff contribute to teaching, and all teaching staff engage in research.

### **Pioneering spirit**

Initiative and fresh thinking guide our work. We subject all our activities to a frank and critical review. We open-mindedly seek out new ways of operating, and abandon activities that no longer serve our goals. We are productive and effective in our work, and do not make concessions on quality. We create the basis for new departures and ground-breaking innovations. We aim to be at the forefront of developments and to contribute in significant ways to the advancement of our people.

### **Partnership**

The advancement of science at the University of Oulu is dependent on participation in the international scientific community. We are alert and anticipate new trends and directions in all parts of society at the global, national and regional level. We choose our partners with care. We see our role as contributing state-of-the-art knowledge

and expertise when cooperating with other higher education institutions, research organisations, public sector institutions, and the business community.

## **6 Programme of measures**

The ambitious goals set by the University of Oulu demand that the University focus on the development of its core activities - research and teaching - and make bold decisions regarding the allocation of resources. In keeping with this aim, an important element of the University's strategy is to strengthen the internal and external cooperation and communication structures relating to the core activities. Increasing internationalisation is an overarching aim informing all aspects of the University's activities. Human resources, support services and the financial base will all be developed in such a way as to improve the preconditions for the University's core activities.

### **6.1 Programme of measures for research**

The University of Oulu aims to distinguish itself as an internationally outstanding science university producing research of increasingly high quality and growing international repute. The University works systematically to intensify cooperation between research and innovation universities worldwide and seeks to play a leading role in such initiatives.

The University's core competence is basic research, i.e. research driven by the research community's own aims and interests, and free from short-term demands for application. The University's programme of measures for research is designed to improve operating conditions for research staff so as to promote internationally competitive, interdisciplinary, comprehensive, and innovative research, while also encouraging the widest possible application of results. In areas of strength that are of strategic importance to the future success of the University, all efforts will be made to maintain and deepen research excellence, and to create the conditions for opening up new fields of research. At the same time, the University is committed to ensuring equal opportunities for high-quality research in all academic disciplines represented at the University. The main lines of the programme of measures are set out below.

Research activities will be integrated into larger programmes offering greater scope for synergy and multidisciplinary, especially in the University's areas of strength. Appendix 1 shows the scientific focus, cooperation structures and postgraduate education provision for each of the focus and development areas chosen by the University. Many of these areas touch on northern and environmental issues. Funding of research in focus and development areas will come both from the University's basic allocation and from strategic funds. Funds available through structural and regional development programmes will also be utilised to further the University's strategy. Postgraduate education will be strengthened by bringing together activities now scattered throughout the university into a unified Graduate School comprising all doctoral and international Master's programmes in the focus and development areas. Research infrastructures will be upgraded in accordance with the infrastructure development program, and sufficient long-term funding will be

provided for this effort. Intensifying internationalisation is a central aim in all aspects of research, not only in the recruitment of students and research staff. Departments obtaining positive evaluations in overall assessments of their research will be granted long-term development funds. The share of external funding (esp. Academy of Finland, Tekes, SHOK, EU framework programmes, ERC, corporate funding) will be increased through more active grant seeking and recruitment of top-level researchers. Under the programme of measures for research, the focus will be on active recruitment; full use will be made of the possibilities offered by the FiDiPro-programme of the Academy of Finland. Improvement in the quantity and the quality of publications is a further aim. Cooperation within the framework of the Innovation Alliance and other forms of strategic cooperation will be central to the University's efforts. All research activities will be evaluated at regular intervals, with the next Research Assessment Exercise scheduled for 2013.

The administration and strategic management of research will be strengthened within the overall management system of the University. A Research Council appointed by the Rector and chaired by the Vice-Rector of Research will be responsible for defining development directions and targets, the organisation of planning processes, resource allocation for strategic measures and monitoring of implementation, as well as evaluation and reporting.

At the Faculty level, responsibility for action and resource planning lies with the Research Committee, which is appointed by the Dean of the Faculty and reports to the Research Council. Chaired by the Dean of Research, the Research Committee also monitors the implementation of action plans as well as the quality of research. Each department or equivalent unit within the Faculty, and each research centre has a Research Development Group (Finnish acronym: TETR ), which coordinates the research activities of the unit.

In order to support the realisation of research projects and the application of research results, as well as the spinning off of research findings into start-ups, the University provides professional support services, also through its network of strategic partners. The University contributes actively to the development of research and innovation services provided by Finnish higher education institutions nationally. It encourages the interplay between basic and applied research, and seeks to utilise the results of research in such a way as to add value to society as a whole, as well as to the local economy and the university community.

### **6.1.1 Research career structure and postgraduate education**

#### **Background and context**

The fragmented careers of research staff, and the resulting financial insecurity, are obstacles to researchers committing fully to a research career at the University. The University of Oulu undertakes to create a four-tier career structure for researchers that will render careers in university research more transparent, predictable and attractive. There is a lack, however, of unified criteria or procedures for progression along a research career path. Doctoral education is spread over a number of different graduate schools, and many students are outside defined programmes. Standards vary between departments, and few students are able to obtain one of the limited number of doctoral student posts funded by the Ministry of Education and Culture.

There are overlapping structures for research education in graduate schools and faculties, and potential synergies between doctoral education and international Master's programmes are not being utilized. Overall, resources are not being used in the most economical and effective ways.

### **Strategic aims**

The University operates a four-tier career structure (tenure track) for researchers based on unified principles and criteria, making a career in research more transparent and predictable. In this way, the University ensures the availability of qualified research personnel to meet the needs of the research and innovation system.

A high-quality Graduate School operating along specific, jointly formulated guidelines provides a varied research environment, in which domestic and international doctoral students work alongside other research personnel. The research education provided, and the doctoral dissertations completed, within the Graduate School represent a high international standard. Doctoral theses connect to other research carried out within the department or research group; in the case of compilation theses, the constituent papers are published in respected international journals. The doctoral programmes of the University are capable of attracting high-potential research candidates from around the world.

### **Development measures**

The research conditions of academic staff will be improved in order to better support the implementation and continued evolution of internationally competitive, interdisciplinary and comprehensive research. A proposal will be elaborated by the Research Council concerning principles and criteria for progression along the four-tier research career structure. On the basis of this proposal, the University Governing Board will decide on guidelines governing research careers at the University, which will be implemented at the faculty and unit level using existing staff resources.

The University strives to ensure equal opportunities for high-quality education in research in all disciplines represented at the University. The effectiveness of research education will be improved, and new international Master's programmes will be developed as part of the new educational structure for future researchers. In this, the aim is to harmonise student intake, create general skills modules, develop student guidance and legal protection, and increase educational effectiveness. International students studying in international Master's programmes will be offered a direct transfer into doctoral programmes. The University's interdisciplinary doctoral programmes and research communities will be developed into desired partners in international networks.

In place of the multiple graduate schools currently in existence, a unified University of Oulu Graduate School will be created, bringing together all doctoral students and participants in international Master's programmes. This new Graduate School will comprise a variety of different doctoral and international Master's programmes, and cooperation between its members and other national and international players will be intensified. To implement the new model, a Graduate Education Development Group

has been formed under the Research Council, charged with drawing up the new guidelines in time for the next national call for Graduate School applications.

### **6.1.2 Internationalisation and recruitment of researchers**

#### **Background and context**

The profile and aims of the University require significant investment in the quality of research and the international competitiveness of its research community in the University's designated areas of strength. The goal of strengthening the international profile of the University makes it imperative to increase the number of students and research personnel recruited from abroad. This increase in diversity will also create significant positive effects for the development of the innovation system in the region.

#### **Strategic aims**

In terms of internationalisation, the aim is to raise the share of international undergraduate students to the national average of 5.5 % by 2012 (compared to 3.2 in 2009), which translates into a yearly increase of 150 students. The University's international Master's programmes offer a direct route into doctoral programmes; the target is for 30 % of graduates to stay on for postgraduate studies. In its postgraduate education, the University aims for 20 % international students. A similar 20 % target has been set for the share of non-Finns among the University's research staff.

#### **Development measures**

Internationalisation is seen as a cross-cutting theme in all University activities. The University's Action Plan for Internationalisation will be reviewed and updated in the light of the needs of education and research. International partnerships of strategic importance to the University will be strengthened; overall, international cooperation and mobility will be increased, e.g. through the development of joint degrees with partner universities abroad. Measures to raise the share of international students in undergraduate studies are outlined in section 6.2.4.

In order to reinforce research capability, approximately 15 so-called "recruitment packages" aimed at strategic focus areas in research will be created. Each of these packages comprises, on average, funds for two research staff plus operating costs, thus making available around 30 new staff in key areas of research. In each of the packages, funding will be provided for a period of 4-5 years. In carrying out recruitment in relation to these packages, internationalisation will be one of the criteria.

All doctoral programmes will include research or study periods at universities abroad. Active recruitment of international students and highly-qualified researchers from abroad will help raise the University's profile and contribute to improving the conditions for research and research education. This will also benefit the career development of the most talented research group leaders, and facilitate their attachment to the University. Special provisions, including the FiDiPro-programme,

will be utilised in recruiting highly-merited researchers. Faculties and departments will take steps to increase the ratio of senior staff to postgraduate students.

### **6.1.3 Research infrastructure**

#### **Background and context**

Achieving excellence in research requires a highly-developed, state-of-the-art research infrastructure, including facilities and equipment, materials collections and databases, some of which form part of national and international infrastructure networks. As it is, research equipment at Oulu University is aging at an alarming rate. Although in recent years special funds have been allocated for investment in the research infrastructure, the University's investment in fixed assets has been just a over one per cent of total expenditure, while at Helsinki University, for instance, the corresponding figure was twice as high. But also other aspects of the research infrastructure are worthy of attention. For instance, in a recent overall evaluation of research at Oulu University (Research Assessment Exercise 2007), it was noted that some of the University's data collections and research archives are highly significant, if not unique in their field.

The University's Working Group on the Research Infrastructure has proposed a development programme for the next financing period. The proposal describes the development needs based on the current state of the infrastructure, and makes recommendations for development, funding and evaluation. As pointed out by the report, the sum allocated to infrastructure investments in 2007-2009 was less than half the yearly depreciation, thus causing a deterioration of the research environment.

#### **Strategic aims**

The University's competitive edge is safeguarded by an up-to-date, scientifically sophisticated research infrastructure that facilitates an interdisciplinary approach. Shared use of facilities is widespread; open access and networking with national and international infrastructures are standard practices.

#### **Development measures**

Of the strategic funds allocated to the development of research, around 3 million euro per year will be set aside for investment in the research infrastructure. Faculties and units working in the focus areas will be directed to draw up long-term plans covering a minimum time span of three years. Funds will be granted on the basis of competitive bids and will require matching funding, with a minimum of 25 % of the total investment cost covered by the unit's own or external financing. Thus, a total sum of 12 million euro will become available on a competitive basis for infrastructure investments in 2010-2012. Proposals for investment will have to demonstrate how the planned investment will benefit research and research education, how it ties in with the University's strategy and its focus and development areas, and how it addresses the recommendations made in the most recent overall evaluation of the University's research. In addition, proposals have to take into account other potential users within the University and the wider network.

The University of Oulu is a partner in a number of projects that form part of the Finnish national roadmap of research infrastructures: FIN-CLARIN (Social Sciences and Humanities), LifeWatch and Fin LTSER (environmental sciences), Instruct (structural biology of macromolecules), and Infrafrontier (biosciences). As part of the Infrafrontier project, which is coordinated by the University of Oulu, the Finnish section of the European Mouse Mutant Archive will be established in Oulu. The EISCAT-3D radar system is another one of the international infrastructures in which the University of Oulu plays a major role. The University will also contribute in significant ways to infrastructures at the national level under a plan for the restructuring and development of the biosciences in Finland.

Investment in very large apparatus or installations, at a cost of millions of euros, will generally require a tie-in with national or international initiatives (Finnish national roadmap, ESFRI) and special funding through these initiatives, as well as a strategic decision by the University Governing Board.

The condition and effectiveness of the University's research infrastructure will be monitored, evaluated and further developed in accordance with recommendations. Special care will be taken to ensure the continuity and predictability of investment activities. Information will be disseminated to scientists at the University about the principles governing the allocation of strategic resources for infrastructure development. Investment decisions will be based on the following criteria: scientific productivity (in terms of University strategy and research assessment results), anticipated use (number of users and utilisation rate), and the possibility of joint use and/or funding.

#### **6.1.4 Creative research environments**

##### **Background and context**

Research activity at the University of Oulu is frequently too specialised and fragmented to allow for the effective use of resources. The possibilities offered by the University's wide range of disciplines and its network of partners are not being used sufficiently.

##### **Strategic aims**

The University's research activities are combined in ways that provide greater synergies and scope for research across disciplines. Multidisciplinary cooperation and cross-discipline communication within the scientific community are encouraged to help identify promising new areas for research. Activities are organised in two main formats: on the one hand, broad-range, multi-disciplinary research institutes and, on the other, more narrowly-focused research centres of 50-100 researchers. Many of these institutes or centres have achieved special distinction as National Centres of Excellence, Nordic Centres of Excellence, or internal quality units of the University.

##### **Development measures**

The University will strengthen the prerequisites for top-quality research through support for its multi-disciplinary research institutes, Biocenter Oulu, Infotech Oulu and

Thule Institute. At the same time, it will continue to develop the activities of a range of more narrowly-focused research centres: the Sodankylä Geophysical Observatory, with its special responsibilities at the national level, the Centre for Wireless Communication (CWC), the Centre for Advanced Steels Research (CASR) and the Centre for Cell Matrix Research (previously known as Collagen Research Unit). In the future, more centres with a specific research focus are likely to be established, such as the Population Research Unit, currently in the planning stage, and possibly a Centre for Language Research.

### **6.1.5 Innovation centres and other forms of strategic cooperation**

#### **Background and context**

The University is well connected with other players in its area of operation, and has a wide-ranging network of partners. However, existing opportunities for cooperation are not being used sufficiently when it comes to turning research findings into new business opportunities.

#### **Strategic aims**

Basic research is one of the elements of the overall innovation system. The University's activities in its chosen areas of focus and development are closely linked to its partnerships within the Oulu Innovation Alliance, as well as other strategically important forms of cooperation with actors in the innovation system at the regional, national and international levels. The University is a key player in the Oulu Innovation Cluster made up of a number of nationally and internationally significant innovation centres and development initiatives aimed at promoting the application of research findings.

#### **Development measures**

The University of Oulu acts to promote cooperation and to improve the structural prerequisites for cooperation in close connection with its strategic partners in the business sector, the VTT Technical Research Centre of Finland, other research organisations, the City of Oulu and the Oulu University of Applied Sciences. The partners in the Innovation Alliance are committed to promoting innovation by developing the necessary structures for cooperation, by creating, strengthening and internationalising jointly defined centres of innovation, and by ensuring the infrastructure and other conditions required for their success. Resources for these activities will be made available under cooperation agreements between the partners, providing joint financing to projects designed to achieve shared targets. Within this innovation ecosystem, the knowledge, knowhow and infrastructure of the University will be made available to the University's partners.

Initially, centres of innovation were formed in the following fields: internet research (Center for Internet Excellence, CIE), print electronics (Printed Electronics and Optical Measurements Innovation Center, PrintoCent), and international business (Martti Ahtisaari Institute of Global Business and Economics, MAIGBE).

Plans are underway for centres of innovation and/or development programmes related to the environment and natural resources (Centre of Expertise in the Water

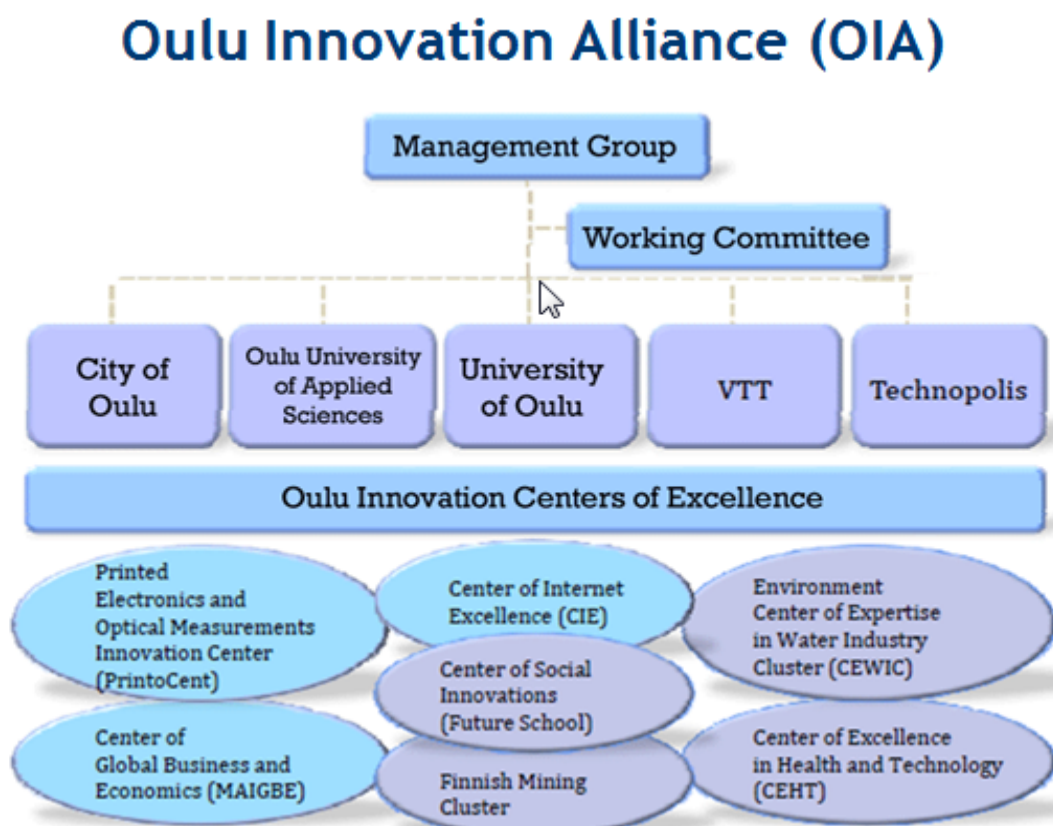
Industry Cluster, CEWIC; SkyPro – Clean Air Cluster), as well as health and medical technology (Centre of Excellence in Health and Technology, CEHT).

In the field of mining and mineral engineering, a national research network is being formed around the Finnish Mining Cluster. This network is coordinated by the Oulu Mining School, which is the national Centre of Excellence in Mining and Mineral Engineering. In the Kajaani region, an innovation centre for measurement and information systems (Centre for Measurement and Information Systems, CEMIS) is being created under the leadership of the Kajaani University Consortium.

The University is also active in a number of Strategic Centres for Science, Technology and Innovation (Finnish acronym: SHOK) and Centre of Expertise competence clusters (Finnish acronym: OSKE ) whose research programmes support the University's focus areas and development directions. These are CLEEN, FIMECC, Forest Cluster, SaWe, and TIVIT, under the SHOK programme, and the competence clusters for HealthBio, Health and Wellbeing, Ubiquitous Computing, Nanotechnology, and Environmental Technology, under the OSKE programme.

The University also takes steps to clarify and strengthen the structures related to the governance of its strategic partnerships.

FIGURE 2. Strategic alliance of the Oulu Innovation Cluster



## **6.2 Programme of measures for education**

In the long term, the University of Oulu seeks to establish itself as a highly-ranked science university commanding interest and respect internationally for the quality of its research and education. For this to be achieved, student learning outcomes and the teaching processes enabling them need to be raised to the level of top universities internationally. This requires immediate development measures that will be financially sustainable only if the University achieves at least medium-level results among Finnish universities on the Ministry of Education and Culture's performance indicators. Achievement of this target will be a priority in all fields of education, in order to ensure the economic conditions for a balanced development of the University. In regional outreach activities, the focus will be on adult education, i.e. professional continuing education and Open University studies.

In the short term, action has to be taken to increase the number of degrees conferred, shorten study times, and grow the share of international degree students. Longer-term aims will be served by pedagogical skills development of academic staff, closer integration between teaching and research, improved standards and heightened internationalisation. All measures, including those taken in the immediate future, have to contribute to a better input-output balance, as measured by the performance indicators of the Ministry of Education and Culture.

The administration and management of education are being reformed to allow for the effective leadership needed to achieve the strategic aims for education. An Education Council, appointed by the Rector and chaired by the Vice-Rector for Education, is charged with defining development directions and targets, managing the planning process, allocating resources and monitoring implementation, as well as evaluation and reporting.

At the Faculty level, an Education Committee appointed by the Dean, and chaired by the Vice-Dean for Education, is responsible for preparing and implementing an action plan for education, and for monitoring the quality of education. The Faculty Education Committee reports to the Education Council. Furthermore, in each department or comparable unit, there is a Teaching Development Group (Finnish acronym: OKTR) charged with coordinating and developing the teaching activities of the unit.

The development programme for education includes both short-term measures designed to rapidly improve the University's performance on the criteria set by the Ministry of Education, and longer-term initiatives aimed at enhancing the University's attractiveness and the quality of education.

### **6.2.1 Research-based teaching and standard of education**

#### **Background and context**

Education leading to a university degree has to be based on scientific inquiry and scientific practices. The goal of a university education is to help students develop sufficient skills already as undergraduates to be able to critically evaluate existing and new knowledge in their field of study. Learning at this level requires deep commitment on the part of students, and a clear focus on learning outcomes on the part of teaching staff. In its educational activities, the University has to be responsive

to multiple and diverse expectations, from individuals' need for life skills to societal requirements, and from the utilitarianism of business to humanistic ideals.

### **Strategic aims**

At the University of Oulu, every teacher performs research, and every researcher teaches. Students are welcomed into the international scientific community upon entering the University, and they are included in its research activities and groups as early as possible in their studies. In all teaching activities, the emphasis is on research-based methods and ways of encouraging student responsibility.

### **Development measures**

As part of a review of teaching programmes, learning outcomes will be defined for each study module, and the relevance of teaching contents for scientific education will be assessed (core curriculum). The scope of individual modules and the workload required for their completion will be monitored, and students will be given intensive support in making effective use of their time at the University.

At the Master's level, study programmes will be developed that are closely integrated with the work of major research groups; students aiming at a career in research will be encouraged to enter these programmes. As a result, students will get involved in research and publishing at an earlier stage, and the time to doctorate will be shortened.

In order to ensure a high scientific standard in teaching, only Ph.D. holders will, as a rule, be appointed to permanent positions involving teaching duties. Similarly, only in exceptional circumstances will a candidate not holding a Ph.D. be selected for a permanent teaching position.

## **6.2.2 Teaching and study skills**

### **Background and context**

University education being science-based, teaching has to be closely integrated with research, and teaching staff will be expected to be engaged in research. This is a pedagogical challenge to which the University must respond, bearing in mind that the attractiveness of the University as a place of study is increasingly determined by the visibility and reputation of its research. One reason for the appeal of the world's top universities is their rigorous and challenging academic programmes, which is counterbalanced by intensive tutoring.

The pursuit of a university course of study requires students to acquire the appropriate learning and study skills in order to be able to engage in scientific study. At the same time, pedagogical understanding and skills are needed by the teachers who are to assist students in this process. It is essential, therefore, for academic staff to possess, in addition to their own specialised subject knowledge, an up-to-date understanding of learning and teaching processes and the uses of educational technology, while also becoming increasingly proficient in providing instruction in languages other than Finnish.

## **Strategic aims**

The University of Oulu acts to strengthen the teaching competencies of its academic staff by offering pedagogical training for university-level teaching. At a later date, such training will be required of all teacher-researchers appointed to permanent positions. This standard course of training will equip participants with the basic skills needed to provide scientific instruction, not only in Finnish but also in English. This will lead to better teaching quality, while also offering tools for raising students' motivation to engage in scientific studies. In a corresponding move, student performance requirements will be raised.

## **Development measures**

Responsibility for the pedagogical training of university teachers will be transferred to the Faculty of Education. Academic staff will be encouraged to make use of course offerings in university pedagogy (25 ECTS credits), as well as shorter teacher training modules and courses in the educational applications of ICT. Staff will also be offered the possibility to engage in further studies (35 ECTS credits), thereby gaining a general academic teaching qualification (60 ECTS credits).

Pedagogical training will be offered as an integral part of the study programme of doctoral students in the University of Oulu Graduate School (general skills section). For international staff and teachers in English-medium programmes, pedagogical training will be provided in English. In addition to pedagogical training, university teachers will be offered pedagogical consultation services, training in mentoring, and supervision.

Student guidance and support will be provided by the Student Services Office acting in conjunction with the Faculties' support units. An annual career path survey will be conducted by the Career Services office together with the Student Union; its results will be utilised by the Education Council in developing the University's student guidance provision.

At the level of study programmes, the aim is to make it possible for students to complete 60 ECTS credits per year in all programmes. A strategic project will be established in order to plan and implement the necessary adjustments to structures and practices.

### **6.2.3. Student recruitment**

#### **Background and context**

Over the past few years, the number of applications to the University of Oulu has not grown significantly, and the actual student intake has remained steady at around 1700. In order for the University to achieve its current target for completed Master's degrees (1570), more than 90 % of new students would thus have to complete their degrees, which cannot realistically be expected. Therefore, the domestic student intake should be reduced slightly, while the application and selection procedure should be improved in order to raise the retention rate.

## **Strategic aims**

The University of Oulu is a highly regarded educational institution attractive to domestic and international students and researchers alike. Student intake has been reduced in a controlled fashion, which has led to a marked improvement in the student-teacher ratio and raised the rate of degrees awarded to well above the national average. A reform of the selection procedure has contributed to a higher retention rate.

### **Development measures**

In developing the University's degree programmes, the focus is on structural reform to increase the attractiveness of Oulu University as a place of study both nationally and internationally. Decisions on student intake and recruitment will be made part of the quality assurance system at the faculty and department level. A strategic project will be instituted to prepare and monitor the reforms.

Degree programmes with lower pass rates, less attractiveness to students, and a weaker scientific foundation, as measured by the quality of research, will be redefined in terms of their subject content; possibly, also student selection procedures and the academic title(s) offered will be part of the reform. Enrolment will be reduced, and the freed-up study places redeployed to other programmes based on past results and educational forecasting. However, care must be taken to avoid impacting negatively on the achievement of degree targets.

In order to enable higher completion rates, students who have obtained a Bachelor's degree under the new degree structure created by the Bologna process will be offered a separate route into the most sought-after programmes at Master's level. This will also increase students' motivation to complete their Bachelor's, and reduce the number of students seeking to switch to other programmes during the general application rounds, which are intended primarily for recent high school graduates. As a corresponding measure, study programmes will be reshaped to allow for painless transfer between selected Bachelor's and Master's programmes.

Decisions concerning marketing are made by the Education Council based on its monitoring of student applications and the progress of graduates in the job market. In addition, the Education Council analyses and anticipates trends in the international education market and proposes measures to increase the attractiveness of the University's educational offering.

#### **6.2.4. Internationalisation**

##### **Context**

Intensifying international recruitment is a logical direction for the University to take, thereby increasing enrolment of new students who are also likely to graduate. At the same time, this would take the University closer to meeting the target set by the Ministry of Education and Culture concerning the share of non-Finnish degree students.

In planning its international strategy, the University needs to be mindful of the fluctuations in international demand for Master's level education in different

disciplines. When establishing new international Master's programmes, plans must also be made for their discontinuation, if and when the need arises. Resources freed up from discontinued programmes will be redeployed to other uses.

### **Strategic aims**

Part of the University's Master's programmes are taught in English, replacing earlier Finnish-medium programmes. A marked share of the students in these programmes come from outside Finland.

English-language services for students and academic staff have been brought up to a good standard, which has made the University more attractive to foreign applicants. Support services are also available to academic staff to facilitate international mobility.

All of the University's international programmes participate in the national trial scheme for fee-based studies; this is complemented by an attractive system of scholarships and study grants. The share of international degree students in the University's programmes is above the national average.

The number of high-potential international staff as a proportion of total personnel has increased significantly. The University's favourable results in the Shanghai Jiao Tong academic rankings and the OECD's Assessment of Higher Education Learning Outcomes (AHELO) are a useful resource in international student recruitment, in which the primary focus is on the Far East.

### **Development measures**

Recruitment of international students to Oulu University will be widened by focusing on sought-after programmes, or parts of such programmes, that can reasonably easily be converted to English-medium instruction, and have a strong scientific base, with close connections to the best research groups in the University. The University will define the criteria and conditions determining whether plans for international recruitment and conversion of teaching to English in a particular programme will be given the go-ahead.

International programmes failing to attract sufficient student interest or experiencing problems during execution, will be discontinued. For the recruitment of international students, use will be made of networks of international exchange students and alumni of the University, as well as the international Master's Programmes based at the University. Existing recruitment strategies will be developed and diversified, in order to avoid over-reliance on a limited range of tools and processes.

The University is also investing in other factors affecting its attractiveness, including student support, tuition fees, and the availability of study grants. In this way, the University will be able to attract a sufficient number of well-qualified candidates both from Finland and abroad, allowing it to choose the best among them. By developing services tailored specifically to the needs of international degree students, the University will ensure that the most talented candidates choose Oulu as their place of study.

The International Relations Office is responsible for international affairs and internationalisation, a task it carries out in conjunction with the faculties and other departments concerned with teaching and student services.

### **6.2.5 Teacher education**

#### **Context**

The University of Oulu plays a key role in providing teacher education in northern Finland. Teacher education will be important also in the future, especially in view of the age structure projections for Northern Ostrobothnia, which differ from those for other parts of Finland. In northern Finland, there is a shortage of experts in special needs education, among others. The significance of teacher education at the University is further enhanced by the City's role as a Centre of Innovation.

The advanced level of scholarship and learning processes involved in academic education requires high-quality teaching on the part of academic staff, and a good educational background with well-developed study skills on the part of future students. The University's Teaching Development Unit has nearly 20 years of experience in research on university-level pedagogy and a strong tradition of developing the teaching skills of the University's staff. Through its activities, the Unit has significantly raised the quality of teaching at the University; this knowhow and expertise should be put to good use. The expansion of teacher training for the University's staff also requires more interdisciplinary research on the subject.

Given the strong currents of change in terms of the contents of teaching, also teacher education itself will have to undergo continual development, if society's needs are to be met. The University of Oulu is in an excellent position to develop teacher education, as shown by the Finnish Higher Education Evaluation Council's decision to award Centre of Excellence in University Education status to the Department of Educational Sciences and Teacher Training at Oulu University.

Teaching content is changing across the board, thus also teacher education itself has to change, if society's needs are to be met. The University of Oulu is in an excellent position to develop teacher education, as shown by the Finnish Higher Education Evaluation Council's decision to award Centre of Excellence in University Education status to the Department of Educational Sciences and Teacher Training at Oulu University.

Research conducted in the University's teacher training departments has highlighted a number of topics for future exploration, including multiculturalism, educational use of ICT, equality, and the prevention of violence. With respect to special needs education, there is an urgent need to widen research-based competency development to include multidisciplinary and multicultural perspectives, in particular.

Due to the speed and intensity of changes in business and technology, pedagogical expertise is increasingly required for development and consulting purposes in work organisations. Since there is no systematic education available at university level to address this need, demand has remained latent. As educational principles and know-how come to be applied more and more also in the working environment, new areas of multidisciplinary research will emerge.

## **Strategic aims**

The contents of the University's teacher education programme anticipate the future needs for teacher training and educational expertise. Teacher education at all levels is research-based and provides an attractive educational continuum to both students and graduates of its programmes.

A newly created study programme to meet the need for competency development in special needs education is operating in close conjunction with existing teacher training programmes and specialists from other faculties. In order to ensure the pedagogical quality of teaching and support the professional development of the University's teaching staff, intermediate-level studies in university pedagogy are provided. Teacher education at the University also offers much-needed educational expertise for other areas of working life. Graduates of other Master's programmes are given the opportunity to pursue Master's level studies in education specialising in organisational development.

A multi-level, integrated system of teacher training and education studies is operating at the University, for which the University's structures provide appropriate support.

## **Development measures**

Drawing on the University's wide-ranging resources in research and development, all types of teacher education (early education, primary teaching, secondary/subject teaching, and university teaching) will be reviewed and updated in terms of their contents and methodology. Contents and competencies developed in the context of the training of classroom (primary) teachers will be disseminated to other teacher training tracks. Teacher training will be systematised to ensure up-to-date study contents at all stages of teachers' professional development. The number of study places on teacher training programmes geared to general education (from pre-school to upper secondary level) will be maintained at the current level.

Multicultural competencies from general teacher education will be applied to special needs education in order to enable appropriate support of immigrants with special needs in educational and integration programmes. This will form the basis for a new study programme in special needs education, with an annual intake of around 20 students, which will be offered also in a continuing education format.

In the Faculty of Education, staff resources freed up at the professorial level will be redirected into research on teacher education, including university pedagogy. The activities of the Teaching Development Unit will be continued under the auspices of the Faculty of Education, while also maintaining their tradition of close cooperation with all disciplines of the University. Intermediate-level studies in university pedagogy will be offered to around 25 university teachers yearly, allowing participants to obtain a Master's degree in Education through further study. The new programme will be networked between faculties and will prepare participants to serve as development consultants in public and private sector organisations.

### **6.2.6 Adult education**

## **Context**

In decree 771/2009 of the Ministry of Education and Culture, the University is charged with responding to the continuing education needs arising from the structural and technological changes in the work environment, and to society's demand for longer work careers, in ways that are financially sustainable. Thanks also to the changes initiated by the Bologna process, the University is now in a somewhat better position to address these challenges. In addition, the experiences gained from past conversion programmes can be utilised in the development of adult education provision. The Open University functions as an efficient channel for recruitment of participants to Bachelor-level studies.

## **Strategic aims**

The University offers demand-based adult education programmes at Master's level, designed to facilitate participants' transition into new professional fields, or new tasks and roles. In many cases, this will be in the form of a second Master's degree granted on the basis of a sufficient amount of intermediate and advanced level studies, and a dissertation. Although some of the required courses will be available through the Open University, studies will for the most part be integrated with the undergraduate teaching programme at the University's main campus.

## **Development measures**

Faculties will restructure their Master's degree programmes to facilitate completion of a second degree. Experience has shown that the greatest demand is for studies in business administration and education: business administration because of needs created by individuals' career progression; and educational science as a result of the growing focus on learning and development in the workplace. Students completing education studies in response to the latter need are not aspiring to teach in primary or secondary schools, which is an important consideration when defining programme content.

Another source of demand are students who took up jobs before completing their studies. This category of students should be given the possibility to take up Master's studies also in fields different from their Bachelor's degree. In order to take advantage of this possibility, candidates will first have to complete their Bachelor's degree.

Technological development and structural changes in industry also create specific continuing education needs. Responding to these needs requires full funding from outside sources.

## **6.2.7 Change management**

### **Context**

In a heterogeneous organisation such as a university, where educational cycles extend over years, rapid modification of structures and processes is difficult to achieve. Both line and process management are required in order to initiate and implement the change process.

The Ministry of Education and Culture has defined the key requirements for change in the latest round of performance negotiations conducted in 2009. The agreement requires the University to raise the pass rate and increase the overall number of degrees awarded. In addition, the Ministry demands that the University grow the share of foreign students in degree programmes.

Furthermore, the Ministry of Education and Culture has announced that performance targets for 2013-2015 will be on the level of results achieved during the previous period (2009-2011). It is therefore essential to marshal the University's resources to improve attainment of degree targets in 2009-2011, since this is the key to maintaining the current volume of activities also in 2013-2015. This policy decision by the Ministry will have to be the key criterion in all target setting and action planning by the University.

### **Strategic aims**

The University takes corrective action in areas of relative weakness, thereby responding to the Ministry's demands while also improving the input-output balance in its educational provision. Specifically, the University aims to

1. increase significantly the number degrees conferred in 2010-2011, in keeping with Ministry targets,
2. improve throughput by streamlining the early phase of study programmes in order to reduce the drop-out rate, thereby preventing a fall-off in the number of degrees granted after 2012, and
3. extend the range of its English-medium programmes in order to increase the share of international degree students, which will also serve to improve the University's results in terms of degrees conferred.

### **Development measures**

The change processes will be set in motion by the Vice-Rector for Education through specially established strategic projects that will identify appropriate measures, as well as monitoring and managing their implementation conjointly with the Education Council. Project leaders will be chosen from among the University's own specialists in the respective area. The Vice-Dean for Education will be in charge of implementing action points at the faculty level.

To increase the number of degrees conferred, study programmes will be surveyed for areas in which there are currently many students who are near to completion of their degree. Many of the programmes in the Faculty of Humanities and in the Faculty of Technology fall into this category. A strategic project will be formed to support the completion of degrees by students who have progressed to the final stages. The project will be entitled "Degree harvest".

In order to streamline progress in the initial stages of study, special attention will be paid to degree programmes in which students have problems getting going and are at particular risk of dropping out. Available statistics on student progress will help to identify appropriate measures. A strategic project entitled "Kick-starting studies" will be formed to coordinate plans and activities in this area.

Speeding up the start of studies also includes appropriate support to international degree students in order to ensure a smooth start to their studies. Matters related to the students' move to Oulu require careful preparation so as to enable incoming international students to concentrate fully on their studies. Student support services play an important role during this phase.

To improve the pass rate, special attention will be paid to creating the conditions for unhindered progress through study programmes. Known bottlenecks in teaching and learning processes will be eliminated. A strategic project entitled "Programme processes" will be established to coordinate the measures taken in this area.

In order to recruit more international degree students to Oulu University, such Master's programmes, or parts of programs, will be targeted that can be converted to English-medium teaching with reasonable effort and are in fields considered the most attractive to international students. University-wide criteria for choosing future international programmes will be drawn up in the framework of a strategic project entitled "International support". This project will also be concerned with international recruitment and strengthening the presence of the University abroad.

Overall, the focus is on structural changes that will both improve degree completion and strengthen synergies in research. In order to identify such elements of change, a strategic project entitled "Structural reform" will be established.

## **7 Monitoring implementation**

The University Governing Board oversees the implementation of the strategy and monitors the effectiveness of the measures adopted. The Vice-Rector for Research is responsible for the implementation of the programme of measures for research, and the Vice-Rector for Education for the programme of measures for teaching. Implementation and monitoring of the strategy are part of the annual planning and follow-up processes at faculty and department level within the University's enterprise resource planning system. Follow-up is based on the performance indicators of the Ministry of Education and Culture and the University's own indicators.