Centres of Excellence in Finnish University Education 2010–2012

Kirsi Hiltunen (ed.)
Foreword

The Finnish Higher Education Evaluation Council, FINHEEC, has implemented Centre of Excellence evaluations of university education commissioned by the Ministry of Education since 1998. These evaluations are the only part of the FINHEEC operations where financial incentives are utilised – after all, selection of Centres of Excellence is a significant funding indicator for the Ministry of Education. The choice of Centres of Excellence and ongoing audits of higher education institutions’ quality assurance systems complement each other perfectly. While the audits are focused on the processes supporting the attainment of the objectives of higher education institutions, the selection of Centres of Excellence evaluates the quality of the operations and their results.

All activities of FINHEEC are based on the enhancement-led evaluation principle. The Finnish higher education institutions are responsible for the quality of education they provide, and the aim of the evaluations is to offer tools to develop this quality further. In order to achieve this, the evaluation process must be credible and perceived to be fair and reliable by the higher education institutions. Moreover, the aim is that while engendering good practices, the process supports the development of quality in all disciplines and the entire field of higher education, not only in rewarded units.

On this occasion the selection method of Centres of Excellence was reformed considerably. In the earlier rounds, the selection was based on applications, which were evaluated by educational field-specific expert panels. The evaluation process corresponded to the traditional peer review of higher education institutions but its reliance on applications increasingly raised questions from round to round. Does a mere application offer enough information and does the picture conveyed correspond to reality? The collection and work of field-specific expert groups as well as the role of pedagogical experts used in the groups also came under scrutiny. Moreover, the lack of an international perspective in the process caused debate. Thus, a method that had initially been good and functioned well was further developed and upgraded to an international level.

This is the first time the selection of Centres of Excellence has been implemented in two stages as an international evaluation. In the first stage, the international evaluation team appointed by FINHEEC anonymously evaluated the applications submitted in English by the university units. Of the 44 applications received by the application deadline, the 18 best were chosen for the second round. In the second stage of the evaluation, the evaluation team was enlarged by Finnish experts who formed work pairs with their international colleagues. All the units chosen for the second round were visited with a view to verifying
the activities described in the application and evaluating the quality of education provided by the unit by means of interviews and observation.

The applications received by FINHEEC were all of a very high standard. The units have invested in developing the pedagogical competence of their teachers, making degrees meaningful wholes, linking research performed in the units with the education provided and taking the world of work perspective into account in the degrees. Teaching and learning are continuously and systematically developed. It is the wish of FINHEEC that the units designated as Centres of Excellence would pay special attention to spreading these good practices.

On behalf of the Finnish Higher Education Evaluation Council, I wish to thank the universities’ management, personnel and students for participating in the evaluation. I would also like to thank the evaluation team for their committed expert work to develop Finnish and European higher education.

_Riitta Pyykkö, Professor_

Chairman of the Finnish Higher Education Evaluation Council, FINHEEC
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1 The evaluation process

1.1 Background

In October 2007, the Finnish Ministry of Education requested the Finnish Higher Education Evaluation Council, FINHEEC, to submit its proposal for eight to ten Centres of Excellence in university education by 30 November 2008 as a basis for the allocation of performance-based funding for the performance agreement period 2010–2012. The Ministry has a special economic incentive, i.e. designation as a “Centre of Excellence in University Education”, to improve the quality and relevance of university education and to encourage universities to carry out long-term development. The nomination of Centres of Excellence in education is thus one means to promote the enhancement of university-level education and to highlight the importance of the quality of education also through economic incentives, in parallel with the Centres of Excellence in research awarded by the Academy of Finland.

Since 1998, FINHEEC has carried out five Centre of Excellence evaluations of university education at the request of the Ministry of Education (Table 1). In these five selection rounds, FINHEEC has desired to emphasise the importance of high-quality university education, studying and learning, to promote the development of education and to make visible good practices in education in its evaluation processes. The overall aim has been to improve the quality of teaching in every subject area and in the whole university sector. Furthermore, the objective has been that merely the application process itself increases discussion of the quality of education and supports the applicant units in their work.

Table 1. Centre of Excellence selections of university education

<table>
<thead>
<tr>
<th>Performance agreement period</th>
<th>Number of applications</th>
<th>Designated units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999–2000</td>
<td>38</td>
<td>18</td>
</tr>
<tr>
<td>2001–2003</td>
<td>53</td>
<td>20</td>
</tr>
<tr>
<td>2004–2006</td>
<td>64</td>
<td>20</td>
</tr>
<tr>
<td>2007–2009</td>
<td>64</td>
<td>20</td>
</tr>
<tr>
<td>2010–2012</td>
<td>44</td>
<td>10</td>
</tr>
</tbody>
</table>
Based on the proposal/decision\(^1\) made by FINHEEC, the Ministry of Education allocates additional funding to the nominated Centres of Excellence in each of the performance agreement period years. The allocation is associated with the universities’ annual performance agreement negotiations and also depends on the size of the universities. The universities, in turn, decide autonomously how to allocate and target the additional funding.

This report will first describe the selection process implemented for the Centres of Excellence 2010–2012. Then, the final result and the applications of the chosen units as well as the evaluation and development feedback will be presented.

### 1.2 The selection method

Over the past decade, the selection method of Centres of Excellence in university education and the evaluation criteria have developed and have been actively updated. In November 2007, FINHEEC appointed a planning group for the preparation of the selection of Centres of Excellence for 2010–2012. The planning group was to write instructions for the universities on applications, a description and timetable of the evaluation process as well as the evaluation criteria. It was also to propose an evaluation team.

The planning group was chaired by Professor Riitta Pyykkö (University of Turku, Board member of FINHEEC, later Chairman of FINHEEC). The members of the planning group included Director Asko Karjalainen (University of Oulu), Academy of Finland Research Fellow Jan Lundell (University of Helsinki), Professor Karl-Erik Michelsen (Lappeenranta University of Technology) and Student Veera Virta (Helsinki School of Economics). The Secretary to the planning group was Senior Adviser (later Secretary General) Helka Kekäläinen from FINHEEC.

Based on the proposal made by the planning group, at its meeting on 29 February 2008, FINHEEC decided to make a significant change in the evaluation method. Firstly, it was decided that evaluation would be implemented for the first time as a two-phase international peer review with site visits. In the earlier selection rounds, evaluations were based solely on applications, which were evaluated by educational national field-specific expert panels. The selection process then corresponded to the traditional peer review of higher education institutions but its reliance on applications increasingly raised questions from round

\(^1\) In the first four Centre of Excellence selection rounds, FINHEEC made a proposal for Centres of Excellence in university education to the Ministry of Education based on its evaluation of universities’ applications, and the Ministry made the final decision. In the recent evaluation round, however, the Ministry delegated its decision-making power to FINHEEC.
to round. That is, it was considered somewhat problematic that it was not possible to verify the activities described in the application in the same way as in an evaluation based on a site visit, although according to a study\(^2\) commissioned by FINHEEC on the Centre of Excellence selection method it was concluded that applications corresponded adequately to the activities described. Secondly, the collection and work of field-specific expert groups as well as the role of pedagogical experts used in the groups also came under scrutiny. It was concluded that the quality of education could be evaluated by experts regardless of their subject-specific expertise. Lastly, it was decided that the evaluation process, previously conducted nationally, would be upgraded to an international level and that FINHEEC would invite international experts onto the evaluation team.

Thus, the revised evaluation method had six main stages:

1. FINHEEC published a call for proposals and evaluation criteria for Centres of Excellence in university education.
2. Universities sent their applications to FINHEEC.
3. The best applications were chosen for the second round by international experts.
4. Units selected for the second round were visited by international and Finnish experts.
5. Experts made a proposal to FINHEEC regarding the Centres of Excellence to be awarded.
6. FINHEEC selected Centres of Excellence 2010–2012 based on the work of the evaluation team.

The evaluation process was implemented according to principles approved by FINHEEC, which are independence, expertise, proaction, international perspective, interaction, transparency and impact orientation. Transparency signifies that the evaluation criteria are published in advance, the report is public and all applications are published on FINHEEC’s website. Another focal principle of FINHEEC’s evaluations is that students are always represented on the evaluation team. Moreover, according to the enhancement-led evaluation principle adopted by FINHEEC, all applicants are given evaluation and development feedback.

1.3 The evaluation criteria

Based on the proposal of the planning group, FINHEEC decided to assess the performance of the applying units in the following content areas (1–5 below): mission of the unit, programme and course design, delivery of education, outputs and continual development. On 7 March 2008, FINHEEC published a call for proposals and requested universities to submit their applications for Centres of Excellence in university education 2010–2012 in English by 30 June 2008. It was emphasised that the performance of a unit responsible for education would be assessed and that it would be desirable for all the content areas assessed to include a description of the activities of the essential personnel groups and student-staff cooperation. Furthermore, the applicants were requested to describe their good practices as concretely as possible and to use the structure indicated by content areas as the headings in their applications.

Content areas

1. Mission of the unit

A brief description of the unit and the way in which the application was compiled and who participated in the work. How does the unit define its role and significance of its own educational mission as part of the academic community and as part of the overall mission of the university? How does the work community as a whole support this educational mission and how does the unit see to the appropriate use and development of the available resources?

2. Programme and course design

A description of curriculum design. How are the degrees made into meaningful wholes and how are their successive and cumulative nature taken into account? How are research and teaching in the unit interlinked? How are lifelong learning and labour markets taken into account in the degrees?

3. Delivery of education

A description of the teaching methods used and how they are chosen and applied. What methods are used to assess learning and on what grounds? How are teaching and assessment methods and work methods mutually supportive?

4. Outputs

A description of the qualitative and quantitative outputs of the unit. Qualitative output means the usefulness of student knowledge; does it meet the objectives set? Is learning enhancing the profound knowledge of the field? The quantitative
output is reported on the attached form, and the applicants are requested to evaluate the balance between the qualitative and quantitative outputs.

5. Continual development
A description of the procedures used to identify critical points in education and in the curriculum and how the problems are solved. How are the degrees, curriculum, and teaching and learning methods developed in the unit? Which development projects is the unit currently engaged in to enhance the quality of education?

The set of criteria was intended to be used flexibly to ensure the objectivity of the evaluation, not as a set of absolute “gauges”. It was planned as a tool geared to help the evaluation team to form an overall picture of each unit’s application and to compare the applications. The aim was to find the real performance quality behind different presentations and linguistic variations.

International interaction, cooperation across disciplinary, institutional and unit boundaries and networking were to be regarded as favourable factors in all the content areas.

Each application had to be a maximum of six pages, including the appendices. The units were requested to submit a background and statistical information form (see sections 2.1–2.10). The application had to be followed by identification information in a sealed envelope. The application was also requested to be written in such a way that the applicant university/unit could not be identified. The universities could propose a faculty or a department as a Centre of Excellence unit.

The maximum number of applications per university has in all selection rounds been proportioned with the number of registered students of the university. On this occasion, each university could submit at least one application; universities with more than 1000 students could nominate two units, and universities with more than 10,000 students could submit one nomination for each starting 10,000 registered students.

Units that had been successful in previous application rounds could participate without restrictions. In the earlier evaluation rounds units that had been awarded a Centre of Excellence status for the two preceding performance-agreement periods were not eligible to apply. Appended is a calculation based on the KOTA database as to the number of applications for each university.

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3 KOTA online service, maintained by the Ministry of Education, offers statistical data on universities and fields of education from 1981 onwards.
<table>
<thead>
<tr>
<th>University</th>
<th>Number of Students</th>
<th>Maximum number of applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Helsinki</td>
<td>38806</td>
<td>5</td>
</tr>
<tr>
<td>University of Jyväskylä</td>
<td>13740</td>
<td>3</td>
</tr>
<tr>
<td>University of Oulu</td>
<td>16041</td>
<td>3</td>
</tr>
<tr>
<td>University of Joensuu</td>
<td>8051</td>
<td>2</td>
</tr>
<tr>
<td>University of Kuopio</td>
<td>6135</td>
<td>2</td>
</tr>
<tr>
<td>University of Turku</td>
<td>16110</td>
<td>3</td>
</tr>
<tr>
<td>University of Tampere</td>
<td>15558</td>
<td>3</td>
</tr>
<tr>
<td>Åbo Akademi University</td>
<td>6781</td>
<td>2</td>
</tr>
<tr>
<td>University of Vaasa</td>
<td>5089</td>
<td>2</td>
</tr>
<tr>
<td>University of Lapland</td>
<td>4680</td>
<td>2</td>
</tr>
<tr>
<td>Helsinki University of Technology</td>
<td>14550</td>
<td>3</td>
</tr>
<tr>
<td>Tampere University of Technology</td>
<td>12285</td>
<td>3</td>
</tr>
<tr>
<td>Lappeenranta University of Technology</td>
<td>5573</td>
<td>2</td>
</tr>
<tr>
<td>Helsinki School of Economics – HSE</td>
<td>4326</td>
<td>2</td>
</tr>
<tr>
<td>Hanken School of Economics</td>
<td>2447</td>
<td>2</td>
</tr>
<tr>
<td>Turku School of Economics</td>
<td>2342</td>
<td>2</td>
</tr>
<tr>
<td>Sibelius Academy</td>
<td>1478</td>
<td>2</td>
</tr>
<tr>
<td>Theatre Academy</td>
<td>437</td>
<td>1</td>
</tr>
<tr>
<td>University of Art and Design Helsinki</td>
<td>1874</td>
<td>2</td>
</tr>
<tr>
<td>Finnish Academy of Fine Arts</td>
<td>252</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

1.4 Universities’ proposals for Centres of Excellence in university education 2010–2012

FINHEEC received 44 applications by the 30 June 2008 deadline. All universities submitted applications. As in every earlier evaluation round, FINHEEC received close to the maximum number of applications (44 out of 47 on this occasion), which also indicates that universities are greatly interested in developing their education. Every application was checked for the formal requirements of the applications and was found to fulfil them. The applications with their identification data were published on FINHEEC’s website in August 2008 after the decision of the units for the second round had been made.

Universities’ proposals for Centres of Excellence in university education 2010–2012:

**Finnish Academy of Fine Arts**  
Department of Painting

**Helsinki School of Economics**  
Department of Languages and Communication  
Finance Area
Helsinki University of Technology
Department of Biotechnology and Chemical Technology
Department of Computer Science and Engineering
Department of Radio Science and Engineering

Lappeenranta University of Technology
Department of Industrial Management

Sibelius Academy
Department of Music Education

Hanken School of Economics
Department of Finance and Statistics

Tampere University of Technology
Department of Mathematics
Department of Production Engineering
School of Architecture

The Theatre Academy
Department of Acting in Swedish

Turku School of Economics
Department of Management
Department of Marketing

University of Art and Design Helsinki
School of Design
School of Motion Picture, Television and Production Design

University of Helsinki
Department of Computer Science
Department of Finnish Language and Literature
Faculty of Medicine
Faculty of Pharmacy
Faculty of Theology

University of Joensuu
Department of Law
Faculty of Forest Sciences

University of Jyväskylä
Department of Physics
Department of Psychology
Faculty of Education
In the first phase of the expert evaluation, an international evaluation team of four members appointed by FINHEEC assessed the applications submitted by the universities. As stated above, the first phase was anonymous, so that the international team was not able to identify the applicants. Experts wrote feedback on each application on a FINHEEC form prior to convening at a workshop on 22 August 2008 to decide on the units to be visited. Out of 44 applications submitted to FINHEEC, the team selected the best 18 for the second round. The results of the first phase were not published at this stage of the evaluation process. However, after the workshop all the applications were published on FINHEEC’s website with their identification information.
The units in the second-phase shortlist were notified separately, and the details of the visits were agreed in early September–October. The visits followed a plan devised together with the units, based on the wishes of the evaluation team. For the second phase of the evaluation, the evaluation team was enlarged by four Finnish experts who formed work pairs with their international colleagues. Each pair of experts and a secretary visited four to five units to verify the activities described in the application and to appraise the quality of the unit’s performance by means of interviews and observation. The visit was an independent part of the application process and, as such, could either augment or reduce the applicant’s weighting in the final choice. These one-day site visits took place from 29 September to 24 October 2008 (see Appendix). During the site visits, the evaluation team supplemented the feedback produced by the international experts based on the findings at the visits.

After the site visits, on 27–28 October, all the evaluators and secretaries convened at a workshop led by the Finnish chair to discuss the findings of the visits and to formulate a recommendation to FINHEEC as to the Centres of Excellence in university education to be rewarded.

The international experts:

Vice Rector Birute Klaas, University of Tartu, Estonia
Professor Arild Raaheim, University of Bergen, Norway
Deputy School Secretary Helen Uglow, London Business School, UK
Head of Unit Stefan Bienefeld, German Rectors’ Conference, Germany

The Finnish experts:

Student Suvi Eriksson, University of Oulu
Student Jonas Heikkilä, Åbo Akademi University
Professor Emeritus Juhani Jussila
Regional Development Director Vesa Taatila, Laurea Polytechnics

Experts represented neither their disciplines nor their background organisations, but acted as independent experts on the quality of university education.

The Finnish chair of the evaluation team was Professor Karl-Erik Michelsen from the Lappeenranta University of Technology. The evaluation team was assisted by Secretary General Helka Kekäläinen and Project Managers Kirsi Hiltunen and Kenneth Lundin from the FINHEEC secretariat.
Project timeline in summary

**Stage I: Publication of a call for proposals and evaluation criteria**
Time: 7.3.2008

**Stage II: Universities prepare their applications**
Time: 7.3.– 30.6.2008

**Stage III: Evaluation of applications**
Time: July–August 2008
The international evaluation team appraised the applications and gave concise feedback on each application on a FINHEEC form. The team convened to select 18 units for the second round at its workshop on 22 August 2008.

**Stage IV: Organisation of site visits**
Time: September–October 2008
The evaluation team, augmented by four Finnish experts, decided on its division of work, and the dates of the visits were set with the units. Each unit planned the programme of the visit together with FINHEEC, based on the wishes of the evaluation team.

**Stage V: Site visits**
Time: 29.9.–24.10.2008
The evaluators and secretaries visited the units.

**Stage VI: Workshop for formulating a proposal to FINHEEC**
Time: 27.–28.10.2008
The evaluation team and secretaries met at a workshop led by the Finnish chair to discuss the findings and to decide on the units to be recommended to FINHEEC. The team formulated a recommendation to FINHEEC as to the Centres of Excellence to be rewarded.

**Stage VII: FINHEEC’s decision**
Time: 13.11.2008
FINHEEC discussed the evaluation team’s proposal at its meeting and decided accordingly to designate ten Centres of Excellence in university education for 2010–2012.

**Stage VIII: International seminar**
Time: 24.–25.2.2009
The evaluation process ends in an international seminar where the evaluation method is presented and the designated Centres of Excellence present themselves.
1.6 Experiences on the selection method
1998–2008

The evaluation team was genuinely impressed with the high quality of the Finnish university education and the quality of applications, which showed that teaching is at the core of the activities of the applicant units. Designated units have made full use of the opportunity, offered by the Bologna process, to reform the structure and content of their degree programmes. Furthermore, there was good balance between teaching and research, and research performed in the units was very well linked with the education provided.

The evaluation criteria were considered to be clear and successful. This was displayed also by the unanimity of the experts when, first, choosing the units for the site visits as well as deciding on the final ten units. The revised framework of the evaluation process functioned extremely well. The units had made a great effort in organising the site visits and the atmosphere at the visits was constructive. The visits genuinely either augmented or reduced applicants’ weighting in the final choice and, thus, provided true added value. Some of the applicant units were whole faculties, some, in turn, small departments, which caused, in some cases, difficulties in assessing and comparing the performance of the units.

On the basis of the experiences over the past decade of all five Centre of Excellence selection rounds, the underlying enhancement-led evaluation principle adopted by FINHEEC has been recognised by the universities as a procedure that supports their work to further improve the quality of their education. According to the feedback from the applicant units, involvement in the evaluation process and merely formulating the application have enabled them to identify their own strengths and development needs.

Applications sent by the universities have generally been of high quality and they have indicated that the applicant units truly appreciate the significance of the quality of teaching and invest in it. The importance of the quality of education and teaching has been highlighted in parallel to research. The units have been very proactive towards pedagogical development, and large numbers of staff have participated in pedagogic training. In the performance of the awarded units, there has also been great emphasis on, among other things, leading education strategically, a clear profile and mission of the education, interlinking research and teaching in the unit as well as continual and systematic development of education.

Finnish and European higher education competes in the global education market. It is no longer sufficient to have confidence in the quality of a country’s higher education at national level, but higher education also must be comprehensible and reliable internationally. In particular, the mobility of students and labour emphasises the need to be able to demonstrate the quality of education.
Therefore, the nomination of Centres of Excellence in university education also aims to improve the overall competitiveness of Finnish university education by demonstrating that Finland has competent and high-quality university education.
2 Centres of Excellence in university education 2010–2012


Centres of Excellence in university education 2010–2012

- Helsinki University of Technology, Department of Computer Science and Engineering
- Lappeenranta University of Technology, Department of Industrial Management
- University of Art and Design Helsinki, School of Motion Picture, Television and Production Design
- University of Helsinki, Faculty of Pharmacy
- University of Helsinki, Department of Computer Science
- University of Jyväskylä, Department of Physics
- University of Lapland, Department of Social Work
- University of Oulu, Department of Educational Sciences and Teacher Education
- University of Oulu, Department of Process and Environmental Engineering
- University of Turku, Faculty of Medicine

In the performance of the selected units, there was great emphasis on, among other things, the pedagogical training of the teaching staff, making degrees into meaningful wholes, interlinking research and teaching in the unit, versatile and international cooperation and networking in education and research as well as the continual and systematic development of education. The units also provided evidence for using teaching methods that enhance deep learning and active participation of the whole work community and students in curriculum/course design and implementation. It is the wish of FINHEEC that the units designated as Centres of Excellence for the period 2010–2012 would pay special attention to spreading these good practices within the whole university community.

In the following, the applications of the units chosen as well as the evaluation and development feedback on each of these units will be presented in alphabetical order. All other applicants have received their feedback only by e-mail.
2.1 Helsinki University of Technology, Department of Computer Science and Engineering

Proposal for a Centre of Excellence in University Education 2010–2012

The Unit (anonymized) applies for a status of Centre of excellence in education for years 2010–2012. The Unit was formed by combining three laboratories A, B and C, when the University (anon.) was wholly reorganized in January 2008. Together with two other departments, the Unit has the responsibility of the Degree program of Computer Science and Engineering (CSE degree program). This application was prepared jointly by two professors from A and B, and many teachers from A, B and C. Several drafts were circulated for comments among teachers/professors and the representatives of the CSE Student Guild.

1. Mission of the Unit

Our mission is to educate professionals and researchers in software engineering (lab. A), software technology (B), and data communication software (C), who can actively tackle challenging computing related problems in all fields of society in collaboration with other people. The education is based on the academic research conducted in the Unit’s research groups. Due to the applied nature of the research and intensive collaboration with companies in research projects, industrial relevance is considered an important part of the education.

The Unit has a wide role in higher computing education. 1) We give basic computing and programming education for the whole university, thus the basic courses in IT, programming and software engineering are very large (200–1200 students). 2) We give three of the six major MSc level specializations of the CSE degree program, corresponding to about 60% of graduates in the whole program. 3) We have two international Master’s programs organized in collaboration with several European universities (e.g, the NordSecMob programme has gained a good reputation as an interesting and well-organised study programme). Foreign students enrich our student population and enable international collaboration among students and teachers. 4) The unit gives doctoral education in all mentioned subjects, and also in Computing Education Research, and is active in several national graduate schools.

The unit is new, but it has very good competences on which we build the quality of education. 1) The pedagogical competence of our faculty teachers is on a high level. Two professors and 18 teachers/researchers researchers (including almost all teachers giving 1st/2nd year courses) have voluntarily taken the pedagogical programme (20 ECTS) of the University, indicating their strong internal
motivation for learning more about education. Many others including several professors have taken shorter courses. Often these studies have been taken as a group, which strengthens their impact on education even more. This commitment is recognized by the Unit when filling teaching positions. The teaching merits have a strong weight in the decisions. It is not a surprise that within the past few years, several teachers have been awarded Teacher of the year award either on the University or the degree program level. 2) The laboratory A has the internal Centre of Excellence in Education status at the University for years 2007–2009, especially for its collaborative development of pedagogical activities. The whole laboratory is engaged in this systematic work. 3) The Basic Computing Unit (BCU) at laboratory B has a very strong experience in developing computing specific learning environments and applying them. Moreover, BCU has a strong research tradition in computing education, which gives it a rigorous base to evaluate and enhance its education. BCU had twice the national Centre of Excellence in Education status (2001–2003, 2004–2006). 4) Laboratory C has a long tradition in developing students’ soft skills, using and developing general and specialized ICT tools, and much experience from international students and collaboration with other European universities in developing education. Jointly these factors provide us common pedagogical awareness, systematic processes, efficient use of specialized technology, and finally, research tradition in computing education. This is an excellent base for our development of education, especially due to the fact that many teachers among the former laboratories have taken joint actions to solve problems already in the past.

2. Programme and course design

In this section, we present the planning of modules and courses (course planning issues are also discussed in Sections 3 and 5, in the context of course development). We also describe the close connection of research and education within the Unit. We do not describe the formal process of compiling the various study guides as it has little effect on actual planning.

The modular structure of the MSc and doctoral degrees are defined by the University. The MSc degree is built from modules, each including several courses, which form general studies, major/minor specializations, methodological as well as elective studies and BSc/MSc theses. We provide the majority of general studies for the CSE degree program, three major specializations for MSc level and several specializations for doctoral level. The contents of the general studies are agreed on with other departments giving computer science education.

Goal setting and planning. The CSE degree program provides many different specializations from theoretical computer science to usability. Therefore, the joint goals for all MSc graduates can be defined only in very general terms (see the mission statement). Actual goal setting takes place in the departments giving
courses for majors/minors, joint basic studies, and doctoral studies. Professors and teachers agree on a set of prerequisite knowledge and skills that are needed from the perspective of the majors. The joint committee with participants from all CSE departments defines the minimum subset of topics each graduate should master. In this phase, the widely known international reference, ACM/IEEE Computing Curriculum has been used as a reference. In 2004–2005, all joint modules were carefully analyzed and revised, after which incremental updates have been implemented each year.

Each major is supervised by 1–5 professors who jointly define the expertise in topics and skills that all students should master (compulsory module) and elective topics in other modules. This wholeness is reviewed and updated each year. The elective modules are used as a flexible tool to create new subspecializations to match the emerging needs of the society. In doctoral education, the Unit has strong collaboration with many other Finnish universities in organizing joint graduate schools (HECSE, GEBSI, SoSE, UCIT). These networks provide our students excellent access to special courses given by national and international experts.

Finally, the Unit has also a very important role in giving basic computing courses to other degree programs at the University. A large number of students also take the general CS minor module, supervised by the Unit. When major changes in this education are to emerge, discussions with other degree programs are carried out to explain the arguments for change, to inform about consequences for further computing studies, and to get any feedback, which aids us to modify courses to better fit general needs. Such rounds have been carried out in 2004 and 2008. The discussions have been successful and good feedback has been received.

Teaching and Research. The Unit has many connections between teaching and research (see Figure 1). All subunits A, B and C have, in addition to more theoretical research topics, research projects with close connections to enterprises and society. This research often originates from practical problems, and especially in subunit A, multidisciplinary approaches have been used (software engineering, usability, social sciences, law). New theories, methods, practices and tools are developed in the projects, and piloted in partner enterprises. The same results give input to developing education in major and doctoral level in the form of new methods, contents and case examples. Examples can be presented both in basic and advanced courses. Many research projects provide topics for students’ team project works. Researchers can test ideas and develop prototypes in these projects in which they act as instructors. Students get relevant topics to explore and work with, and often contact with real customers in enterprises; thus they can experience the relevance and applicability of the skills and knowledge they have learned. Finally, research projects offer MSc thesis topics, often initiated from the team projects. Many students end up working part time in the research
projects and continue to do their Master’s thesis. Some papers from these theses lead to international publications, and some of these students start doctoral studies thereafter.

Another collaboration form is enterprise training where special courses on current theories, methods and tools are directed to people working in companies. On the other hand, many experts from industry and many foreign visitors give special lectures in courses, or run whole graduate courses and seminars.

A specialty in the Unit is the strong research tradition in computing education that originates from the development of automatic assessment and visualization software to support programming education since mid 1990’s. Currently BCU is one of the largest Computing Education Research (CER) groups in the world. Since the year 2000, this multi-disciplinary group has published over 25 international journal papers and over 50 international conference papers. Two doctoral theses, 4 licentiate’s theses and 12 MSc theses on this field have been written since 2003. The Unit has established a doctoral specialization in CER to support getting more doctoral students work on these problems. Eight doctoral thesis projects are currently active on topics like students’ understanding on computing concepts, dropout reasons in a programming course, adaptive feedback on assignments and interactive visual learning environments. As this is a
multi-disciplinary field, we emphasize giving both qualitative and quantitative research methods courses and sharing research traditions and practices of different fields, especially in computing and educational sciences. The courses have had participants from many Finnish universities, but also from Sweden and Baltic countries.

Research and education benefit from each other in many ways. The research utilizes the large courses as an excellent data collection pool for experimental and longitudinal studies. The objectives are to study effects that the developed educational technology tools and methods have on students’ studying practices, attitudes and learning outcomes. The results are applied to improve our education in terms of enhanced software tools, new types of exercises, better lectures, and course materials. One such tool, developed in the group (Anonymous Tool 1), is currently used in 7 other universities in Finland, and one in US.

In addition to BCU group, several other people in the Unit work in the CER field. Jointly they act as an example and innovator for others in the University and in other institutes. Research method training supports conducting educational studies in other fields. We have been strongly involved in developing the international Koli Calling conference on computing education research that is currently one of the top conferences in the field. We have also chaired a national engineering education conference, and organized there an internationally reviewed research paper track and special sessions for engineering education research to support this growing field. Moreover, BCU coordinates a programming education network with other Finnish universities that develop new technologies. The network meetings support dissemination of the tools and best practices. Currently a survey is conducted to identify obstacles for adopting such tools, and based on that, new initiatives will be taken.

3. Delivery of education

Quality of teaching is always based on **competent and motivated teachers.** *Professors* lead the process and define the broad lines. They mostly concentrate on instructing and supervising MSc and doctoral thesis projects, and giving specialized graduate and doctoral level courses. *External experts* give special courses often providing a link to industrial applications. *Teaching assistants* (TA) assist other teachers in the large courses by providing classroom exercises and personal instruction, and grading homework and exams. TAs are usually majoring in the subject they teach and work often as research assistants, furthering their own skills. However, the faculty teachers have the most important role in implementing MSc education and they form the heart of the strong teaching culture. The interest in pedagogical studies started in BCU in late 1990’s launching a culture of discussion on education. The enthusiasm spread as a grass root movement to other labora-
tories that form the Unit. It has brought us a culture, where innovations, experiments and discussion on education flourish.

**Teaching methods** are versatile as based on pedagogical studies, most faculty teachers have a fair understanding of current pedagogical concepts and trends, and a willingness to adapt their courses to match current needs. Most courses have lectures, but various exercise types and sessions, laboratory works, projects, team works, seminars, problem based learning, learning diaries, etc. are widely used to activate students. In all large programming courses, automatic assessment tools are used for activation by setting up lots of compulsory programming or algorithmic assignments and giving each student immediate feedback on submitted solutions. For example, in the Data Structures and Algorithms course, the students work with and explore the topics on a conceptual level in terms of graphical interaction and personally tailored exercises with feedback in Anonymous Tool 1. Our research has shown that this method produces similar learning outcomes as with human tutors, but with human resources such feedback would be impossible to give. Moreover, by automating assessment of the basic exercises, we can direct human resources to instruct more advanced topics.

**Assessment** is often a process with several factors affecting the final grade. *Authentic evaluation* has a strong role in the personal and team projects as well as in assignments. Portfolios and even blogs are used on some courses. Written examinations are used mostly for two reasons: as a control method against plagiarism, and to assess theoretical knowledge. ICT tools, email, newsgroups, and chat have been used regularly since late 1980’s. Collaborative web tools like Gatherplace, Flashmeeting, Wikis, and Google Groups are used on several courses. Course web pages include instructions and learning resources on most courses. Integrated environments, like Moodle, are used on some courses, but often standard ICT tools and web are used to provide the same services. Much effort has been put on building and adopting specialized learning environments, also in collaboration with other departments. For example, the Anonymous Tool 1 was extended to include algorithmic exercises in geoinformatics together with Institute of cartography and geoinformatics. Also international collaboration in developing educational tools is carried out (JHAVE, WebCat).

All major specializations in the Unit require students to take a *year long project work* in which a major software system is built in a team. The goals of this project course are manifold. The project allows to apply knowledge and skills acquired during previous studies to solve a practical large scale problem. The project imitates industrial or research projects closely. Each project has a real customer, which in many cases is some external company. In addition to applying technical skills, the goal of the project is to learn important soft skills, including customer negotiations for gathering requirement specifications, software project management, long time team work, project documentation, presentation and evaluation skills.
4. Outputs

Our goal is to educate professionals capable for tackling challenging problems of the society. This is well achieved, because the employment rate of graduates is close to 100%. In fact, as there is shortage of professionals in our field, our problem is that students are recruited too heavily and too early during their MSc studies. About 90% of MSc thesis projects are carried out in companies/other organizations. Most MSc theses get high grades (at least 4 out of 5), and the local instructor’s final statements about the projects are in generally very positive, and indicate high professional level and good skills to work independently. A survey for external instructors conducted in this spring confirmed this feedback. Doctoral graduates are also well received in enterprises or as postdoc researchers/faculty teachers in many institutes.

However, the impact of our education is not restricted to CS majors. Computing technology is being applied heavily in all engineering sciences, and our role in providing the basic knowledge and technical computing skills are very important for all graduates from the University. This means heavy teaching load for us, but with the aid of technical solutions we have been able to produce good competences for CS minors, as well.

5. Continual development

The CSE degree program has a web based feedback mechanism coordinated by the feedback committee for CSE departments. Regular feedback questionnaires are published for all courses at the end of each semester. In addition to the standard questions, teachers can include their own questions to get more feedback and improve courses further. Serious problems are reported to department heads, but typically problems are solved by the faculty teachers. Best courses and teachers are given public credit. In addition, the Unit has also a long history on collaboration with the CSE student guild. The guild selects representatives for several formal and informal committees that coordinate and plan education together with the faculty teachers.

Often collaboration is started spontaneously among teachers when a problem or a new idea for improving instruction/assessment has been identified. Experiences of tested ideas and practices are shared jointly. The Unit supports this culture by allowing faculty teachers considerable freedom in organizing their courses: within the budget limits given to them, they can choose the teaching and assessment methods they find the best suited in their course. This freedom is important as the scope of courses range from large introductory courses with 1000+ students to small scales doctoral seminars. The discussion culture, on the other hand, dampens the risk of misusing this freedom, and supports innovations in education, analogously to research. However, to be able to maintain good practices for a
longer term, formal procedures are needed to support them. Examples of such procedures originating from the informal teacher groups include the regular feedback gathering mechanism and the feedback questionnaire authoring tool and plagiarism case instructions. The subunit A has put much effort in building processes that support collaborative planning and evaluation of education.

Examples: For all basic and intermediate level courses, the core topics have been identified, and an analysis for student workload has been carried out. The introductory programming education team continued the core topic analysis by defining and publishing requirements for different grades on their courses. Teachers of core courses of laboratory C agreed on and published rules how writing and using citations are instructed and evaluated on their own basic courses. Teachers of subunit A have adopted and developed many tools to aid collaboration both in Internet and on lectures. The OVA tool, e.g. supports lecturing by aiding students to familiarize themselves in advance with the lecture topics, and carry out formative evaluation of their own learning. Finally, as soon as the old laboratories were joined in January 2008, a new practice was started that the teachers from the laboratories get together once a month to discuss education and get to know each other better. This is important in order to disseminate good practices and to build the new department a stronger unit.

BCU research supports both basic and advanced education in many ways. Perhaps the most important thing is that teachers follow the international research on teaching/learning their subject, and thus can import ideas, methods and tools to their own teaching work, and can apply research to solve their problems in education. For example, the automatic assessment tools gather much information about students’ working processes such that would be inaccessible in traditional teaching/learning methods. This data can be analyzed, e.g. to identify student groups having problems in their working style (too much trial and error), and to improve our course material and lectures. Moreover, interviews and questionnaires for students are used to collect data of their learning. Qualitative analysis of interview data has revealed interesting knowledge about misconceptions that teachers should be aware of. Furthermore, one doctoral study surveyed how different stakeholders saw the needs for software systems graduates, and thus summarized the needs for developing this specialization further. Finally, an ongoing doctoral study surveys the problems of dropouts in basic programming courses from many perspectives. It has revealed us the complexity of dropout reasons, thus indicating that there are no simple solutions. Rather, many non-stop actions are needed on course level, organizational level, and in student counselling.

Many challenges remain, however. We need to integrate teaching cultures from the three former laboratories, and disseminate their best practices and competences within the whole department. The first steps have already been taken.
We organized a department-wide full day seminar in early spring in which the quality and best practices in education were discussed. Problems and development areas were identified and subgroups started working on them from basic computing level to doctoral education. They will propose concrete plans for the steering group of the Unit. Teachers have formed a teaching workgroup and network that provides a way to sustain and improve teaching in a peer-supported environment. The strategy process initiated by the steering group has defined coordinated development of education as one of the corner stones of the Unit. Goal setting in larger perspective, above course level, needs to be clarified. We need to build a systematic process for following students’ progress in their studies. A regular feedback mechanism for industry is also needed.

A serious problem is the high dropout rate (20–30%) in some programming courses. Based on the research carried out in BCU, however, the Unit has a better understanding of the problem, and new actions, for example, building peer networks, using team assignments, giving better feedback, and changing the first programming language next year, are taken.

The international trend of decreasing enrollment in CS programs applies to us, as well. We get more students with lower background skills and enthusiasm than a few years ago. As a consequence, CS majors’ dropout rates in CS courses have increased. In fall 2007, a team was formed to analyze the problem and control the remediation actions. Many students having problems were interviewed. Several factors that need attention were revealed, e.g. inadequate studying skills, lack of motivation, poor skills in time management and planning studies. Actions will be taken next fall: we strongly support for building a peer network and better tutoring system in collaboration with the CSE student guild. Personal study plans are prepared in a more detailed level and their realization is discussed in the tutoring groups.

Finally, as the quantity of doctoral dissertations per professor is not in a high enough level, several actions have been taken. Research method training has been increased. The culture of writing publications is being supported by mentoring, setting up goals for publications rate, and improving the instruction by acquiring external, preferably international instructors for thesis projects. A special attention has been paid to support doctoral students working in industry often lacking contacts to the academic world.

In summary, there is a long way forward. The new Unit is in the phase of transformation, where three teaching cultures will be merged to one. This is not a simple task, and takes years. However, with the help of the strong teaching personnel and many competences, we have a good chance to succeed and build an even stronger educational unit.
Supplementary statistical and background information

The university proposes (circle the appropriate item) 1 Faculty 2 Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

The itemized data is the sum of laboratories A (code 11120), B (11160) and 50% of C (11190).

Some information concerns the whole CSE degree program because there is no statistics available on department level.

NOTE. BSc degrees have been provided since 2005 only. Therefore the low numbers, all of which have transferred their studies from earlier degree requirements.

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students*</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>185</td>
<td>138</td>
<td>159</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>126</td>
<td>109</td>
<td>98</td>
</tr>
<tr>
<td>Lower (BSc) degrees awarded</td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Higher (MSc) degrees awarded</td>
<td>92</td>
<td>95.75</td>
<td>84</td>
</tr>
<tr>
<td>Median duration of study in years (BSc + MSc)</td>
<td>6.7</td>
<td>7.4</td>
<td>**</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit***</td>
<td>16916</td>
<td>16584</td>
<td>13332</td>
</tr>
</tbody>
</table>

* of Degree Program – the Unit’s share of this is about 60%

** missing data

*** Credits completed by degree students on the courses of the Unit. The large decrease in 2007 results from major changes in the degree program requirements due to the implementation of the Bologna process in 2005

<table>
<thead>
<tr>
<th>Postgraduate students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>152.5</td>
<td>159.5</td>
<td>173.5</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>5</td>
<td>6.50</td>
<td>4.00</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>5</td>
<td>6.25</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor subject students (students from other units)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students, total*</td>
<td>3958</td>
<td>3778</td>
<td>3631</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>16186</td>
<td>13601</td>
<td>12746</td>
</tr>
</tbody>
</table>

* number of enrolled minor students on all courses in the unit

<table>
<thead>
<tr>
<th>Other education provided by the unit*</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* missing statistics

Description of other education provided by the unit
2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>57,86</td>
<td>57,35</td>
<td>54,7</td>
</tr>
<tr>
<td>Professors</td>
<td>11,44</td>
<td>11,67</td>
<td>11,58</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>12,86</td>
<td>8,86</td>
<td>10,75</td>
</tr>
<tr>
<td>Other personnel</td>
<td>32,85</td>
<td>31,06</td>
<td>37,29</td>
</tr>
<tr>
<td>Docents/Adjunct professors*</td>
<td>9,5</td>
<td>11,5</td>
<td>11</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents)**</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

2.*not available in KOTA database, information gathered from Study Program
** no statistics available

3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students*</td>
<td>115</td>
<td>142</td>
<td>159</td>
</tr>
<tr>
<td>Foreign postgraduate students **</td>
<td>40</td>
<td>46</td>
<td>53</td>
</tr>
<tr>
<td>Foreign personnel***</td>
<td>2 (7)</td>
<td>2 (3,5)</td>
<td>5,5 (13,5)</td>
</tr>
</tbody>
</table>

3.*, ** of Degree program
*** The amount of foreign visitor (months)

4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>3173</td>
<td>3622</td>
<td>3890</td>
</tr>
<tr>
<td>External funding (1000 e)</td>
<td>4717</td>
<td>5396</td>
<td>6108</td>
</tr>
</tbody>
</table>

5. Graduate schools and educational networks

Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years

- HECSE, Helsinki Graduate School in Computer Science and Engineering
- SoSE, Software Systems and Engineering graduate school
- UCIT, Graduate School on User Centered Information Technology
- GEBSI, Graduate School for Electronic Business and Software Industry

6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

1) We follow statistics collected by various external organizations, like Finnish Information Processing Association, Finnish Association of Graduate Engineers TEK, ...
2) We send questionnaires to employers and instructors of students working on their MSc thesis projects
3) All graduates fill a graduation questionnaire which also asks about their working career
4) There are explicit researches, such as a doctoral dissertation “Needs assessment of Software Systems Graduates”
Evaluation team’s feedback to the unit

1. Mission of the unit

The department shows an impressive interest in and motivation towards teaching and learning. This is exemplified by the fact that many staff members in the department have taken the pedagogical programme at the university (20 credits). The fact that these studies have been taken as a group serves to strengthen the interest in and possible benefits from this training.

The unit’s mission is clearly stated, and much effort is invested into creating a good learning environment. The department is involved in teaching at various levels and in various programmes, with group sizes varying accordingly. This creates some extra challenges for the teaching staff, who, nevertheless, seem to be well managed. There is compelling evidence of the department’s strength and focus on pedagogical research, development and training. Furthermore, there is a clear and visible internationalisation strategy, and links to industry are strong.

2. Programme and course design

The planning of the educational programme is based on a collective discussion of prerequisite knowledge and skills, and with reference to an international computing curriculum. This serves to ensure a common understanding of the what’s and how’s of teaching and learning, and constitutes a very positive approach. Another obvious strength of the unit is its computing educational research group. The research activities of this group are often focused on issues relating to its own educational programme, resulting in information that may be of direct importance to the programme and to other institutions. The department is one of the largest computing educational research groups in the world. Its students are well prepared for the labour market.

3. Delivery of education

The variation in teaching and learning methods of this department is a strong element. It is also obvious that the department has a very clear and theoretically well-founded basis for its assessment procedure, in which the emphasis is on authentic assessment. At the same time, the staff are not blind to the possible drawbacks, such as plagiarism, of alternative assessment methods such as portfolio assessment.

The teaching staff are very conscious of the fact that different students learn in different ways, and they try to vary their teaching methods and assessment procedures accordingly. They acknowledge that there is a challenge
concerning dropouts. However, no dropouts have been reported in modules in which problem-based learning is employed. The question of why students drop out is also a topic of one research project in the department.

The department has developed a system of computer-based feedback that it wants to develop further, as it has been acknowledged that feedback on learning tasks is very important and that actions may be taken to improve on this. Several courses are taught in English, and the department is able to attract a high number of foreign students.

It is recognised that the department has, as one of its assets, a very motivated, highly skilled and research-oriented professor with a special interest in questions relating to learning by students. It is obvious that this person has been able to pass on this interest to other members of staff, and the department appears to be a very student- and learning-oriented department.

4. Outputs

The quantitative outputs are good as far as the employment rate and credit production is concerned. The department has also won prizes for its work on teaching and learning. There is a fairly high dropout rate in some programmes, and the median duration of study is reported to be rather high. The department explains this as resulting from the high interest from industry, with students being recruited before they finish their degrees. This obviously represents a big challenge, and good cooperation with external parties in industry is needed. The same is true if the department is to improve its post-graduate education and increase the number of students gaining doctorates.

5. Continual development

The department is the result of a merger between three formerly separate units, each with its own research strengths and history of teaching and learning. The way that the new unit has reacted to the merger, e.g. with open discussion of best practices, is admirable. Likewise, it is very positive that teachers across the old units have formed teacher workgroups to improve teaching and to provide peer support.

The department is well aware of the major challenges facing it. One challenge concerns the high dropout rates in some programmes. The department shows that it is taking this problem seriously, and will introduce measures that will most likely help this situation. Likewise, the department plans to take action to meet the challenges relating to enrolment, i.e. students with lower background skills/less motivation. All in all, the unit appears to be a very active, creative and caring teaching/learning environment.
2.2 Lappeenranta University of Technology, Department of Industrial Management

Proposal for a Centre of Excellence in University Education 2010–2012

1. Mission of the unit

Industrial management combines the fields of technology, business and management. Our mission is to help companies to improve their competitiveness by training professionals who are capable to integrate these fields and by producing research-based methods and solutions for developing business and management processes. We offer our students a combination degree: major subjects in industrial management are produced within the department, and studies in technology are outsourced from the university’s technology departments. Students may also include wider field of business studies from the business administration department. Studies of industrial management do not aim for narrow specialisation in one specific field. Instead, the goal is to merge expertise in technology and management, and consequently, to equip graduates with tools for working in a digital, international and networking business environment. As business and industrial environments are constantly evolving, the Department of Industrial Management has accommodated to these changes by branching out to the service sector, and especially to industrial services.

Studies at the department include undergraduate, postgraduate and adult education in industrial management. In addition, our strategic focus is on research and regional collaboration and development. Close cooperation with companies is characteristic of the research conducted at the department. Also the majority of Master’s theses are commissioned by businesses, which enhances the interaction between the department and industries, and promotes the employment of graduates (in 2007, 81% of the Master’s theses were completed for businesses and 19% for other organisations). We have expanded our network through regional units in two university consortiums. The role of the regional units is to convey academic expertise to the area through research and development as well as education. In the autumn 2008, one of our regional units will start a new cooperation programme with two other universities and one university of applied sciences, Institute of Design. Moreover, the department participates in multidisciplinary research conducted by three of the university’s independent research units. International students have the opportunity to participate in the International Business and Technology Management Programme (IBTM). Approximately one hundred exchange students participate in the IBTM programme each year. A completely new project at the department is an innovation-related summer school, which brings together students from three renowned Russian universities.
The department fosters a spirit of community between its members. The spirit consists of commitment, co-operation, openness, and cheerfulness and spontaneity. The key to this is the department’s annual development workshop. In this two-day event, staff and students evaluate the current activity of the department and brainstorm and plan future development projects. These projects are related to both studies and research. The development workshop creates a shared foundation for the use and development of resources. The development workshop has been a success: roughly 80% of teachers, researchers and administration from the department sign up annually. Also the present application has been discussed in the development workshop in early June 2008. In addition, the preparation of this application has involved comment rounds and team work. The teams were composed of a head of a degree programme, three professors, a study coordinator, five students and a lecturer. The application leans on the department’s quality management practices, which have been established during the past decade and substantially influenced by the Centre of Excellence acknowledgements. The Finnish Higher Education Evaluation Council has evaluated and nominated the Department of Industrial Management as a Centre of Excellence in university education for the years 2001–2003 and 2004–2006.

2. Programme and course design

The curriculum is designed to cater to the professional needs of Bachelor’s and Master’s level graduates. Currently, we consider the Bachelor’s degree as a gateway to Master’s degree studies, introducing the student to scientific thinking and methods. The Master’s degree from the Department of Industrial Management includes 60% industrial management studies, 20% basic professional-related studies and 20% technology studies. Completing the Master’s degree at the Department of Industrial Management equips graduates with

- expertise in business and a strong understanding of production and technologies in a company
- knowledge of how businesses operate, and how to further improve the efficiency of these operations
- the ability to plan and manage projects and work in a team
- develop a company.

The department accrues up-to-date information on the professional requirements of graduates through the supervision process of Master’s theses. Typically professors supervise 10–20 Master’s theses annually. In addition, 20% of the teaching staff teaches in the university’s continuing professional education programmes targeted for mature students in full-time employment. These programmes are a natural, interactive medium that allows professional experience and research expertise to meet. Personal views on the require-
ments of the world of work are backed by collecting annual feedback from the graduates and a follow-up feedback five years after graduation. Feedback over a longer period is acquired through the university’s alumni activity.

The information on professional requirements translates into instruction through systematic, extensive curriculum planning at both the strategic and the operative levels. Strategic planning comprises the work of an advisory steering committee for curriculum design and the above-mentioned departmental development workshop. Both of these bodies deal with large-scale reforms and development of content areas. A large number of participants contribute to these discussions and workshops. Operative curriculum design consists of planning carried out by the curriculum committee, and by professors and teachers coordinating specific content areas. The curriculum committee is in charge of the overall contents of the degree programme. Coordinating professors are responsible for all of the courses and modules in their major subject. The development of individual courses is the duty of the coordinating teacher(s) for the course in question. The curriculum is prepared according to an established schedule and handled in three different meetings (Fig.1). The approach is participative, and the leading idea involves open dialogue and continuous development.

The strong suit of the department, but also its greatest challenge, is its heterogeneous student body. There are six different paths for applying to Bachelor’s studies, and seven paths to admission into Master’s programmes. Half of the students have already completed one degree, possibly from another field entirely and many of them have professional work experience.
All students should be offered a learning path that suits them and their professional development. In keeping with the spirit of life-long learning, students receive not only education, but also study guidance and instruction in learning techniques and approaches. The department has invested in providing services and study guidance for a heterogeneous group of students, especially by means of individual study plans (eHOPS), and teacher and peer tutoring. To ease students into their studies, the university has prepared a quality manual aimed for all of its students. In addition, the Department of Industrial Management has its own manual “Rules of the Game”. All industrial management students take the compulsory course Introduction to Studying Industrial Management, which deals with academic learning skills, the online learning environment Blackboard, and preparing the student’s individual learning plan eHOPS. Students admitted directly into the Master’s programme prepare the individual study plan eHOPS, which is then discussed with the study coordinator. A wide course tray in major and minor subjects allows students to follow their own, individual learning path. In order for students to build on their existing knowledge, courses are linked to each other with prerequisites indicating which courses should already be completed. Core contents and workloads have been analysed for each course. The degree structure takes into account previous studies, which may be included in the degree or based on which complementary studies may be recommended. Also the university’s continuing professional education in industrial management and international studies can be included in the degree. For example 42 students from the department studied in the partner-universities abroad in year 2007.

In addition to supporting the student at the beginning of his or her studies, special attention has been paid to the final thesis. The web-based manual “Thesis Roadmap”, developed by the department, aims to help industrial management students in planning and preparing their Master’s thesis. The Thesis Roadmap is available online, and it contains all the necessary instructions and material for the Master’s thesis process. The manual is an innovative model for preparing and supervising a Master’s thesis, and it serves as an integrative tool for the student, the organisation commissioning the thesis, and the supervising professor. The Thesis Roadmap has been presented as a Best Practice at the national pedagogy days.

3. Delivery of education

Annually the department produces 98 undergraduate courses. Approximately one third of the courses are for the Bachelor’s degree, and two thirds are for the Master’s degree. Of the courses, 18 are taught in English. The department offers six major subjects: Technology Management, Management Accounting, Industrial Marketing and International Business (area of specialisation: Russia and Other Transitional Economies), Supply Chain and Op-
erations Management, Technology Entrepreneurship and Information and Knowledge Management. Since the range of courses is wide, we have adopted influences from a number of different learning paradigms. We strive towards constructive alignment, in which learning outcomes, core content analyses of courses, assessment methods of learning and teaching methods support each other appropriately and promote the student’s development as a learner. The choice of teaching methods is influenced by learning outcomes, content and quality requirements for instruction, the time and financial resources spent on instruction, the teacher’s personality and number of students in the course.

As a result of active pedagogical development of instruction, the department has strongly emphasized a student-oriented approach instead of a teacher-oriented one. The sole use of lectures and literature examinations in instruction has decreased, and pair, group and project work is on the increase. Lecturing is applied as the only method of teaching in merely 13 courses, and only 4 courses are based on a literature examination. All other courses include other teaching methods in addition to lectures, and some have abandoned lecturing altogether. Other teaching methods include tutorials – for either exercises or case studies – assignments, seminar and related presentations, supervised teamwork, games, constructing models, and learning diaries. Material produced through these alternative teaching methods is also assessed, and the assessment has an impact on the final grade. Hence the assessment is congruent with learning outcomes. An individual examination is applied as the only method of assessment in 23 courses, whereas alternative assessment methods are used in 75 courses.

The group sizes are large (80–350 students) in approximately 35% of courses, and small or medium size (10–79 students) in 65% of courses. Large courses are mainly included in the Bachelor’s degree and are also a part of the curricula of other degree programmes. The learning outcomes for these courses focus on learning the key concepts, methods and theories of the field. Real-life, motivating examples and material from the world of business and visiting lecturers demonstrate the practical importance of the topics with regard to the world of work. This also motivates and equips students for advanced courses, which are carried out in smaller groups. Interaction in instruction has been boosted by using Voter-equipment, workshops, handouts that students fill out, peer tutoring by students, and the Blackboard online learning environment. Blackboard works as a discussion platform, newsgroup and way to distribute and give feedback on assignments. Blackboard also includes an updatable course material bank. Peer tutoring, in which students guide their peers and tutors receive additional credits, has been used as a way to dividing a large group of students into smaller ones for calculation tutorials.

In small and medium-sized groups, interactive and collaborative learning and learning by doing play an essential role. Small and medium-
sized course groups apply teaching methods that promote skills and knowledge needed in real-life situations in the world of work. This is achieved through assignments that require practical problem solving, decision making and development of activities, through extensive true-to-life material, and high-pace interactive team work. In order to support the focus on the world of work, experiential learning is applied in the form of role play and simulations. They allow students to see and experience the concrete consequences of their decisions and development measures in a situation imitating real world. Problem-based learning and model-based learning are implemented to enhance the student’s ability to recognise and retrieve theoretical information and to apply it to practical problems. Students construct models with software provided by the department. Advanced courses also include assignments and extensive special projects commissioned by businesses, in which students solve practical problems for the company. The department’s GDSS research laboratory (Group Decision Support Systems), which is an effective tool in teaching and research on group decision making, is the only one of its kind in Nordic universities.

Courses typically have more than one instructor. Pair and team work among teachers enhance the possibilities for study guidance. In large-scale courses, students are usually assessed by the lecturer responsible, but in small and medium-sized courses also the assessment duties are divided among the teachers. In addition to assessment by the teacher, the department favours peer and self assessment. Teacher cooperation is also supported by the Blackboard online learning environment, which used at the moment in 36 courses. They are either blended learning courses or material banks, because the aim is to produce courses that combine web-based and contact teaching instead of pure online courses. Blackboard makes adult education and distance learning more flexible and facilitates the use of assessment methods alternative to examinations. Blackboard also introduces students to online environments, teaching skills that are applicable in working life.

4. Outputs

In 2007 the department has exceeded the quantitative educational goals by 30%. In June 2008 has been achieved the 60% of yearly educational goals. Our role in merging technology, business and management is manifest in the vast amount of studies offered to other departments, as well as in 20 continuing education courses or programmes. In terms of quantity, the educational results are sufficient in ensuring that the department remains a vital centre of expertise and continues to develop at both the national and international levels.

Measuring the quality of education from both the students and the working life’s perspectives entails that courses are of a high quality, studies do not stagnate, and one’s skills are demonstrated in a final the-
sis, after which the student should find employment in his or her own field. During their studies, students feel that they are learning something new when they are able to apply what they have learnt to subsequent courses, and when their overall picture of industrial management studies expands. An analysis of the course-specific feedback at the department indicates that the number of participants in a course affects the feedback average. According to the analysis, the average value for feedback on large-scale courses has been good, for medium-size courses and for small courses excellent. The department’s qualitative results are depicted in Table 1. The table compares the results of the department to those of other units in the university.

### Table 1. Qualitative comparison between the Department of Industrial Management and the other technology units of the university

<table>
<thead>
<tr>
<th>Quality indicator</th>
<th>Department</th>
<th>Others average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median duration of studies (time from admission to graduation)</td>
<td>4 yr. 1 mo.</td>
<td>4 yr. 7 mo.</td>
</tr>
<tr>
<td>Employment at the moment of graduation</td>
<td>82.4%</td>
<td>74.6%</td>
</tr>
<tr>
<td>Satisfaction with studies at 5 years after graduation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• extremely satisfied</td>
<td>37%</td>
<td>12%</td>
</tr>
<tr>
<td>• satisfied</td>
<td>37%</td>
<td>49%</td>
</tr>
<tr>
<td>Total</td>
<td>74%</td>
<td>61%</td>
</tr>
<tr>
<td>Accumulation of completed courses during the first two years (ECTS cr)</td>
<td>105</td>
<td>81</td>
</tr>
</tbody>
</table>

In sum the quality indicators show that the Department of Industrial Management achieved higher rank than the others.

5. Continual development

Problem areas and development needs in education are pin-pointed by monitoring information collected systematically at the university-level on quality indicators, by studying related reports, and by systematically collecting course-specific student feedback. In addition, the department makes the most of its staff members’ experiences from the world of work. An extremely important way to collect improvement ideas is to collaborate with the Industrial Management Student Association. So called “Home Circle” activities entail regular cooperation between the department and the student association. The aim is to profit from the association’s expertise in the development of instruction and in creating a welcoming environment for students. The Home Circle meets three times a year, and it is composed of various representatives from the student association and the management committee of the department.

Development needs are taken into account in the development of instruction, which has an annual schedule similar to the preparation of
the curriculum. The development process is divided into the development of individual subjects and that of degree programmes. Subject-specific development includes course feedback from students, which is collected following a department-wide policy with the W-pol feedback system. W-pol feedback is analysed in the management committee and at the major subject level in individual performance and development discussions. For advanced courses, feedback is also collected before the end of the course in feedback discussions, which students have considered useful. A key part of the development of courses is pair and team work carried out by teachers, which a reflective approach through discussions between colleagues. The department supports the continual evaluation and development of instruction by arranging “niche training”. It consists of pedagogical training provided by a third party but adapted to Industrial Management.

At the degree programme level, the annual evaluation and development cycle includes workshops of the advisory steering committee, the departmental development workshop, Home Circle meetings and monthly meetings of the management committee. In its autumn workshop, the advisory committee for the degree programme discusses the development needs related to the quality management system for studies. The spring workshop of the committee evaluates the instruction in the past year and discusses the development of the degree programme content and organisation. The departmental development workshop sets teaching and research development projects in motion. The projects are organised into project groups with teachers of different subjects, administrative staff and students. The departmental management committee, in their monthly meetings, selects which projects are implemented and monitors them.

In 2000, a new era began in the quality management practices of the Department of Industrial Management. That year, the department established a professorship with duties involving industrial management pedagogy. This tenured employee has managed and coordinated the pedagogical transformation process and training together with a committee appointed for the purpose, including representatives of all parties involved. In consequence, nearly all members of the teaching staff have taken part in pedagogical training within the department or university, or at a national level. Our ongoing development projects include a mentoring project targeted for young teachers and postgraduate students, a project aiming for the completion of old unfinished degrees, and the development of a student portal. As a result of the department's annual development workshop in June 2008, new focus areas for academic year 2008–2009 have been identified. These focus areas are related to the department’s marketing and communication, the interaction between research and teaching, the company perspective in the development of the degree and studies and support for doctoral students in firms. The development workshops for
teaching and learning, and the annual systematic development work have led to the emergence of a strong quality management culture in the department. The now established development process continues each year to produce new projects related to problem areas in instruction. This is our way to meet the future challenges and ensure the quality of education.

Supplementary statistical and background information

The university proposes (circle the appropriate item) 1 Faculty 2 Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

* no information gathered at university during the years 2005–2007

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>179</td>
<td>239</td>
<td>243</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>984</td>
<td>1064</td>
<td>1098</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded (admitted students since autumn 2005)</td>
<td>-</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>99</td>
<td>98</td>
<td>129</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>4 yr 5 mo.</td>
<td>4 yr 4 mo.</td>
<td>4 yr 1 mo.</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit</td>
<td>32560</td>
<td>29874</td>
<td>30950</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>86</td>
<td>93</td>
<td>125</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>5</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor subject students (students from other units)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students, total</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other education provided by the unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td>16368</td>
<td>13768</td>
<td>13356</td>
</tr>
</tbody>
</table>

Description of other education provided by the unit

Offering teaching for other units: other departments or degree programmes, Centre of Training and Development (programmes for industry and business and open university courses), International Services (IBTM-programme).
2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel **</td>
<td>65.7</td>
<td>81.4</td>
<td>83.1</td>
</tr>
<tr>
<td>Professors **</td>
<td>13.5</td>
<td>14.5</td>
<td>14.2</td>
</tr>
<tr>
<td>Other teaching staff **</td>
<td>51</td>
<td>66.9</td>
<td>68.9</td>
</tr>
<tr>
<td>Other personnel **</td>
<td>14.7</td>
<td>18.8</td>
<td>23</td>
</tr>
<tr>
<td>Docents/Adjunct professors **</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents)</td>
<td>26</td>
<td>12</td>
<td>16</td>
</tr>
</tbody>
</table>

** man-years

3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students</td>
<td>8</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Foreign postgraduate students</td>
<td>6</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>2612</td>
<td>3024</td>
<td>3412</td>
</tr>
<tr>
<td>External funding (1000 e)</td>
<td>979</td>
<td>1548</td>
<td>2689</td>
</tr>
</tbody>
</table>

5. Graduate schools and educational networks

**Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years**

Finnish Doctoral Program in Industrial Engineering and Management (p), Aleksanteri Institute (p), KATAJA – Finnish Doctoral Program in Business Studies (p), Graduate School in Intellectual Capital and Knowledge Management (p). Finnish university pedagogy and academic development journal “Peda-forum”: one of unit’s professors as a member of editorial board.

6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

National career survey (5 years after graduation) university employment survey for undergraduate degree recipients (appendix to the degree certificate application).
Evaluation team’s feedback to the unit

1. Mission of the unit

The department has a clear and well-formulated mission statement. There is very good collaboration between the department and the labour market and clear vision of regional development processes. The unit has close cooperation with regional companies and organisations, and takes a leading role in a number of initiatives. The panel encourages the department to strengthen its international links.

The unit has the rare distinction of being a genuinely interdisciplinary department.

The department has embedded an effective quality culture based on both systematic development work and very positive attitudes towards continual development.

The unit offers adult education in industrial management, which is well received by external stakeholders.

2. Programme and course design

The unit has developed a systematic approach towards curriculum and course design in the form of an annual cycle, based on a more overarching core analysis. Students make an important contribution e.g. through the Home Circle activities.

Teaching reflects departmental research and the needs of the professional life; case studies are often based on research projects. The panel encourages the department in their plans to strengthen the degree to which research is interlinked with teaching.

Course feedback from students is methodically used and there is evidence of actions taken in response. Staff compile feedback summaries and discuss with students actions to be taken.

There is a clear understanding of the particular needs of diverse student cohorts, and support is provided in an accessible and timely manner. A learner-centred approach to teaching and tutoring is well organized. Individual study plans (e-HOPS) form part of this. The unit also puts special emphasis on the final thesis. All this adds up to a comprehensively systematic and coordinated learning environment.
3. Delivery of education

Delivery of education effectively matches outcomes with teaching. An extensive range of interactive and student-centred learning methods is used. Students commented particularly on the use of case studies and the virtual learning environment. Co-teaching (teaching sessions undertaken jointly by two or more teachers) is successfully used to the benefit of both students and staff.

Many different assessment methods are used and they are clearly fit for purpose. Mid-course feedback is provided on longer courses.

According to students, staff are approachable and always available for extra support.

4. Outputs

Quantitative outputs are excellent. The high quality of graduates was recognised by external stakeholders, particularly the students’ readiness for professional life and knowledge of both business and technology.

It might be beneficial for the unit to track and trace more closely students not completing their studies.

5. Continual development

Work is undertaken continuously to improve the teaching and learning environment. The annual development workshop is an excellent innovation which gives the unit new ideas in this area.

The unit is very proactive towards pedagogical development. Nearly all members of the department have chosen to participate in pedagogic training. This enlightened culture really encourages continual development of teaching skills. The student tutors would also benefit from such excellent training.

The department puts significant time and effort in collaborating with external stakeholders. A variety of creative links and partnerships has been established.
2.3 University of Art and Design Helsinki, School of Motion Picture, Television and Production Design

Proposal for a Centre of Excellence in University Education 2010–2012

1. Mission of the Unit: Innovative approach to artistic practice and academic knowledge

In its educational field the school is the only university-level unit in Finland. It gives artistic education related to audiovisual and creative industries and does research that strengthens its educational base. The school values its 50-year-long tradition but is at the same time conscious of future challenges. Both the education and other processes are analysed by a working group of quality assurance. The school recognises its role in generating prerequisites for general well-being, understanding and tolerance, affecting the overall quality of life in society.

The school offers education at Bachelor’s, Master’s and doctoral level. It has two degree programmes with 10 areas of specialisation. The teachers and the researchers are among the best practitioners and theoreticians in their fields. The administrative and planning staff consists of head of education and administration, other administrative personnel, studies and research coordinators (3) and work masters. They are highly experienced and familiar with the field. The aim of the support services is to enable students and professors to concentrate on creative work instead of administration. The school coordinates one national research school. Excellent facilities and support services are offered by a separate organisational unit which employs carpenters, lighting masters, projectionists and others whose main task is to assist project work. The organisation forms a close co-operative team based on its areas of specialisation.

The school is a vital combination of traditional research university curriculum and innovative art academy education. It cultivates research and pedagogy working in close co-operation with both national and international universities. Being in a process of becoming a part of wider national university structure, the school sees as its role to act as an upholder of artistic quality and research innovation. It constantly monitors changes and developments and meets challenges by evaluating its curriculum and the relevance of research.

The school follows a strategy agreed by the board of directors of the university. Resources are negotiated annually in a group consisting of the dean, two vice-deans and professors of each specialisation area. The resources are allocated on the basis of performance and according to educational, research and artistic results. The research personnel prepare the applications for external funding
sources. The school co-operates with several partners in projects and productions. Final thesis works are financed partly by outside companies and organisations and provide added value.

This application has been compiled by a working group consisting of the dean, two amanuenses, the head of education and the research coordinator. The group has received valuable advice and critique from the working group of quality of assurance in the school and the colleagues within the university.

2. Programme and Course Design: Developing creative industries – strengthening creativity

The approach to curriculum development reflects the practices of working life, acknowledging the specific tasks of each specialisation. Professors, lecturers, staff and students take an active and everyday role in evaluating the exercises and the curriculum through different work groups, boards and committees. This work is practical and goal-oriented and based on open discussion of the value base and goals of studies, research and practices. Also operators in the industry take part in the evaluation of the curriculum.

Most of the education is carried out in a fruitful dialogue of theory and practice. It provides students tools for critical thinking and abilities to respond to critique. These skills are taught creatively in exercises and productions. The working methods ensure the skills needed in the trajectory from educational institute to working life. An example is presented in Appendix 1. Constant feedback and discussions allow and encourage critical reflection and versatile evaluative considerations. Lifelong learning is built into the curriculum so that students are aware of the need and prepared to learn more after graduation.

During the last couple of years the school has carried out core analyses where new inter-disciplinary working methods have been developed to support traditional teaching. The analyses have widened the practical and theoretical approach of artistic and academic training and ensured possibilities to establish new intensive planning teams, discussions and concepts. At the organisational level this has meant new working groups for preparatory work in addition to regular teachers’ meetings. The school has developed directives and classifications through which the importance of preproduction, purposeful budgeting and resource allocation is learned.

BA degree studies offer a widening and gradually deepening process approach stressing practical and operational skills combined with a sound understanding and knowledge of culture, theory and history. Language and team work skills are practiced for functional purposes, while academic skills are introduced along and with the more practically oriented exercises. A successful BA student has learned the craft, knows the theoretical approach behind it and has developed an initial personal method of practicing, analysing and cultivating his or her art.
In MA degree studies a more personal and complex approach for artistic purposes is encouraged. It requires students to experiment and take artistic risks in exercises. In graduation projects full personal responsibility of one’s field of orientation is combined with team effort that involves solutions to production, economic and technological matters, and, of course, major artistic decisions. In theoretical studies on MA level students extend their approach and craft to more profound questions of the nature and purpose of the creative artistic processes. Sometimes the subjects dealt within the production and theory parts of graduation works generate ground-breaking research questions for doctoral studies.

The school has a 25-year-long history of doctoral education and research, which is exceptional internationally. The graduate school was established already in 1998 and has developed into a national research unit with a strong reputation at an international level. The research is process-orientated and aims at creating a new, theoretically expanded basis for the field. It renders visible and articulates but at the same time also questions the dramaturgical, production-based, conceptual, social and political presumptions and conflicts that are connected with practices. Another important thread involves a better understanding of changes in production processes brought by new technology. The results of the research have a direct impact on the development of curriculum. Recently the school has appointed docents to support and further develop research projects.

Participation in international conferences and meetings is encouraged to facilitate benchmarking. The school is an active member of different educational organisations that regularly discuss degree requirements and best practices. The school also participates in an EU programme that aims to smoothen the transition from education to working life by arranging workshops for graduating students. In these gatherings a strong emphasis is also placed on the development of co-operation at a European level since co-productions are becoming an increasingly significant future working opportunity to our graduates.

The school invites international artists and researchers to head workshops and give lectures. International co-operation is an inherent method. The curriculum includes international practical exchange and training periods.

3. Delivery of Education: Constant communication as a basis of education

The skills and knowledge of the graduating students are guaranteed by recruiting high-level professionals and experts in their respective fields to professor and lecturer posts and by working in close co-operation with the creative industries. The recruitment process is open and pedagogical talent is evaluated in demonstration lectures, which are a vital part of the selection process. Professors are usually appointed for five years to guarantee versatile artistic approaches. Appendix 2 presents a list of recent honours awarded to teaching staff.
The education is carried out in lectures, discussions, analyses and practical exercises, which make up two thirds of the studies. Students compile personal study plans with the professors.

From the very beginning the students are familiarised with teamwork and the production-oriented working process through practical exercises. During them the students gradually start to take on more and more responsibilities, so that after graduation they can administer extensive projects and lead a working group on their areas of specialisation. The students are expected to be able to analyse, develop and initiate the context of their artistic, production or research work. One of the most important tasks is to learn to balance the budget and to be able to master financial planning. Student productions grow progressively towards independent responsibilities and an artistic, technical and theoretical grasp on the students’ fields of expertise. An example of the scope and length of a student project is presented in Appendix 3.

To illustrate the important dimensions of pedagogical thinking the school has introduced three models (or pets). In the so-called CAT model creativity is combined with artistic teamwork, in RAT radical approaches are tested and, finally, MOUSE combines meaningful subjective ethos with originality and universality.

<table>
<thead>
<tr>
<th>CAT</th>
<th>RAT</th>
<th>MOUSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creative</td>
<td>Radical</td>
<td>Meaningful</td>
</tr>
<tr>
<td>Teamwork</td>
<td>Tester</td>
<td>Ethos</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Universal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subject</td>
</tr>
</tbody>
</table>

Self-assessment, meaning of reflection and goal-oriented process are emphasised in education. The productions are systematic and controlled. In the process students work both as effective members of a team and as specialised experts of their field of art. Both the outcome and functioning, economic efficiency and mental well-being of the students involved are assessed. Each exercise involves a thought-out report of self-assessment by students.

The school co-operates with other art universities: joint courses and seminars are organised regularly. Students from other universities participate in and contribute to the artistic outcomes of productions and projects. Also international co-productions have been carried out successfully.

Exercises and productions are assessed and deconstructed afterwards. The school regularly organises feedback sessions in which professionals from the field participate. Professionals visit the autumn and spring screenings which are open to the public. Informal discussions with the public are of great value, too.
4. Outputs: Possibility to succeed and courage to risk as outcomes of education

The most prominent practitioners and artists in the field have graduated from the school. The graduation productions have won several international prizes yearly – even some of the BA-level exercises have gained success in competitions. The school is about to achieve the key strategic aim: to become a top international educational unit in its field while maintaining the leading national role.

The core production groups and networks are formed already during studentship. Usually the same group continues its artistic career in professional life. As an example of long-standing co-operation we can mention two distinct artists who have been working together since their first school exercise. Subsequently they have made together three international large-scale co-productions which have been recognised and awarded nationally and abroad.

The number of applicants has grown steadily. The percentage of intake is around 2–10 depending on the specialisation. Only the most talented are accepted, therefore the motivation of our students is very high. In a sense it is an achievement in itself to be admitted to the school. For the last couple of years the quantitative results have been encouraging, the number of graduates has exceeded the number of admitted students.

Small teaching groups allow deep interaction. Teachers can effectively ascertain the learning process. The interaction could be described more as a mentoring process: professor-student relationships develop towards reciprocity, to colleague-colleague relations. Alumni also participate in the mentoring when they supervise or examine final theses.

The quality of education is regularly benchmarked on international arenas. This means also evaluation of teaching methods and the work of the organisation. Participation in festivals forms the core of the school’s institutionalised international activity. The school productions participate in 30 festivals yearly. Festival selection could be described as resembling a scientific referee system. Not all the entered works are accepted, and the prize is a real achievement. Festival participation is probably the most important tool in evaluation, and the success reflects the validity of education. In Appendix 4 there is a short list of the latest prizes to our student productions.

5. Continual Development: Maintaining strengths and recognising weaknesses

For curriculum development the school has a working group that organises and controls the evaluation and preparation process of the formal degree requirements. Current degree requirements are analysed by each area of specialisation using the SWOT model and paying special attention to the rapidly changing professional environment and global developments.
The interaction between students and teachers is an open and constant process. These contacts are an essential part of the studies, and also provide a valuable opportunity for instant feedback. However, we continuously accept and pursue more versified evaluation and assessment approaches to keep abreast with the ongoing situation and experiences of our students. In its intensity, it is a demanding but necessary system. Teachers are encouraged to keep pedagogical skills up to date.

The working group for quality assurance produces information needed for the development of the well-being of the students and the staff. Through the quality work the rationality and functionality of the organisation is checked. Also partnerships and joint activities are evaluated. Most part of this evaluation is carried out together with partners.

Our connections to working life are extremely close. The school is in a unique position to receive face-to-face feedback from the students’ future employers and from those who eventually screen or exhibit their work. This proximity guarantees also training places for the students. In the surveys the school has received highest scores on the taught skills relevant to future professional life. The employment opportunities are quite good because the relevance of audiovisual and creative sectors is nowadays increasingly recognised. Employment opportunities for graduating students are becoming more and more global – therefore international co-productions are part of the curriculum.

Appendix 1: Example of joint studies and thematic structuring of MA studies: Horror Movie

This MA-level project involves several programmes and schools and co-operates with both international and national universities and professionals. The umbrella concept ‘horror movie’ covers several study modules and courses in the MA programme and offers a possibility to either study jointly the whole project or to participate in seminars and courses both for Finnish-speaking students, international students and exchange students.

The aim of the project is to focus on the genre of horror movie, to combine research, planning and hands-on working – the traditions and present day of the genre. The project will start with a two-week seminar including lectures, screenings, visitors and case studies. A short script will be used as a basis of the work, and the group of MA-students in several fields – producers, cinematographers, cameramen, art directors, costume designers, actors – will research and make preplans, designs and final realisations of sets, props and costumes for the film. The film will be shot in a film studio; a few outdoor locations will be scouted, too.

The project includes several international workshops: sketching, storyboard, art direction and special props and masks workshops. They will host international teachers from Britain and New Zealand. Digital postproduction will be one of the special areas for students to concentrate on. The duration of the whole project will be 25 weeks. The students will be tutored to attend the courses and workshops according to their personal areas of interest as stated in their PSP.
Appendix 2: Artistic activity of teaching staff

The schools professors and lecturers have received the following prices for their artistic work during 2005–2008:


They have published 4 books and 6 refereed articles in 2005–2007 and realised several artistic projects including for example 3 TV series, 2 documentary films, 5 screenplays and 3 exhibitions or performances.

Appendix 3: Example of teaching period: student production I

<table>
<thead>
<tr>
<th>week</th>
<th>1–3</th>
<th>4–7</th>
<th>8</th>
<th>9</th>
<th>10–12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>idea</td>
<td>screenwriting</td>
<td>preprod. kickoff workshop</td>
<td>preprod. first production presentation</td>
<td>pre-production continues</td>
<td>pre-production second production presentation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>week</th>
<th>13–15</th>
<th>16–17</th>
<th>18–22</th>
<th>23–26</th>
<th>27</th>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pre-production continues</td>
<td>shooting period</td>
<td>editing</td>
<td>sound + paperwork</td>
<td>colour grading, graphic design</td>
<td>premiere, feedback, assessment</td>
</tr>
</tbody>
</table>

Appendix 4: Festival success

KESTOMERKITSIJÄT, Road Markers, fiction, dir. Juho Kuosmanen Cannes Film Festival, June 2008, France. Cinéfondation 3rd prize (out of 2000 applications 17 were selected to the competition).


Fidec – International Festival for Film Schools, October 2007, Huy, Belgium, Le Prix du Public.

Tel Aviv International Film Festival, Best film, June 2008.


Nordisk Panorama, September 2007, Oulu, Finland. Best Nordic documentary film.

International Documentary Film Festival Amsterdam, November, DFA, 2007.
KESÄN LAPSI, Summer Child, documentary film, dir. Iris Olsson
Full Frame Documentary Film Festival, April 2008, Durham, NC, U.S.A. Best student film, "President’s Award".
Tromsø International Film Festival, January 2008, Norway. Series Films from the North, best documentary, "The Tromsø Palm".

LILLI, documentary, dir. Oliwia Tonteri
4th Fresh Film Fest Karlovy Vary, August 2007, Czech Republic. 1st prize, best film.
Sleepwalkers’ Student Film Festival, November 2007, Tallinn, Estonia. Honorary mention.

Supplementary statistical and background information

The university proposes (circle the appropriate item) ① Faculty
② Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>33</td>
<td>24</td>
<td>28</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>203</td>
<td>200</td>
<td>214</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>24</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>15</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>7.5</td>
<td>8</td>
<td>7.5</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit</td>
<td>7112</td>
<td>6375</td>
<td>7185</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Postgraduate students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
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</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>22</td>
<td>24</td>
<td>22</td>
</tr>
<tr>
<td>Licentiates awarded</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>1</td>
<td>3</td>
<td>1</td>
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</table>

<table>
<thead>
<tr>
<th>Minor subject students (students from other units)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
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</thead>
<tbody>
<tr>
<td>Students, total</td>
<td>56</td>
<td>27</td>
<td>50</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>361</td>
<td>217</td>
<td>435</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other education provided by the unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>27</td>
<td>26</td>
<td>28</td>
</tr>
<tr>
<td>Professors</td>
<td>9</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>13</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Other personnel</td>
<td>9.5</td>
<td>10.5</td>
<td>10</td>
</tr>
<tr>
<td>Docents/Adjunct professors</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Amount of teaching given by adjunct professors (docents)

3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Foreign postgraduate students</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>4965</td>
<td>5285</td>
<td>5489</td>
</tr>
<tr>
<td>External funding (1000 e)</td>
<td>166</td>
<td>45</td>
<td>134</td>
</tr>
</tbody>
</table>

5. Graduate schools and educational networks

Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years

Graduate School of Audiovisual Media (c) 1998–2001 – National Graduate School of Audiovisual Media (c) 2002–2005, National Graduate School of Audiovisual Media (c) 2006–2009

6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

The system of quality assurance produces information about the placement of graduates in working life and jobs corresponding to their education. Since 1991 we have used two different questionnaires to get information systematically: one for graduating students when they are finishing their studies and leaving the school and the other for those who have graduated two years ago. In addition we use focus groups panels.
Evaluation team’s feedback to the unit

1. Mission of the unit

The school has a clear mission statement and description of the unit. The education provided is related to the audiovisual and creative industries and fits with the mission and vision of the university. This became even more evident during the site visit. The main mission is to facilitate a process of personal growth of the students as artists and to develop their own “voice” and identity.

The school also considers that its mission is to create and foster multi-professional teams of artists in film-making with different specialisations and to foster respect and understanding for the different professions. This has a profound effect on the ways and pedagogical models of teaching. Furthermore, according to the students, staff and external stakeholders, this has had a profound effect on changing and developing the Finnish film industry and the way people interact in everyday working life in their later careers.

The unit explicitly sees its mission as being to foster a combination of teaching, research and education at a very high academic level. It coordinates a national graduate school and is one of the few film schools in Europe awarding PhDs. This results in the school being used as a benchmark by many other European film schools that are currently in the process of establishing PhD studies. Research in this context means that there is a process of reflection in working as an artist, which is combined within a theoretical framework. All PhDs are a combination of artistic and theoretical work. The school attaches great importance to the fact that their PhDs are academic doctorates and not purely artistic ones.

The school has a good and strong international network and collaborates with similar schools in teaching, student exchanges, joint productions and research.

2. Programme and course design

The school offers two programmes with a total of 10 specialisations. It has conducted a core analysis of the programmes and switched to the BA/MA structure in the mid-1990s. It actively participates in EU programmes and projects. The school also has a very strong connection to the labour market and creative industries and gives consideration to developments in the professional field in designing its programmes. At the moment, a process of curriculum development is underway. These activities demonstrate that the school has a strong interest in further developing its education. It is also clear that the
education and the educational programmes are carried out/organised in close cooperation with the students and the labour market.

There is a natural and good progression throughout the programmes (BA–MA–PhD). The first year is common to all students. Student tutors help with orientation in the school. Throughout the year, all the specialisations are taught together to foster understanding and respect. From the second year onwards, the students are divided into their respective specialisations, although there is cooperation between departments on various projects.

A quality assurance system has been developed. The school is aware of the fact that it should involve the students more actively in this work. Furthermore, the school is aware that having teachers on a 5-year contract poses challenges to the stability of the programme delivery. Therefore, the policy has been changed and the school tries to ensure a balance between permanent staff, staff on 5-year contracts (tenure track) and visiting lecturers.

The needs of lifelong learning are taken into account in the programme design and through constant contacts with the labour market. Furthermore, the school cooperates with the open university in LLL courses.

3. Delivery of education

All the students have a personal study plan that is discussed with teaching staff in one-to-one tutoring on a regular basis. Students consider this helpful, especially at the master’s level. At the bachelor’s level, the majority of courses are compulsory.

The teaching model may best be described as an apprentice-master model. The teachers see their role mainly as one of facilitators or coaches, fostering the artistic development of students and helping them to increasingly make their own choices. Since the student-teacher ratio is exceptionally low, there is almost one-to-one teaching. Teaching takes place in small groups and the atmosphere in the faculty is very open and non-hierarchical. Teachers and students cooperate closely on making films and have very close personal relationships.

The pedagogic models RAT, CAT, and MOUSE are applied in teaching situations. In addition, the school works on projects that use a so-called triangular model. Producers, directors and screen writers cooperate in teams of three people to make a single film. At a later point in time, production designers, sound designers and others join the team when the actual production plan is drawn up. This is then discussed with the teachers and put into practice. The teachers support the students in this process and collaborate closely in planning the educational process.
Teachers are encouraged by the university to take courses in pedagogy and to engage in research. Also, they are frequently given the opportunity to take sabbaticals to work in their respective field of specialisation to ensure close contacts with working life. The frequent use of guest lecturers ensures a fresh perspective in the education delivery and that the latest ideas and developments in the labour market are included in the curriculum.

Students are encouraged to carry out traineeships and many alumni who have their own companies offer these positions to students. In addition, students are encouraged to visit film festivals and study abroad.

Assessment is continuous and relies mainly on formative techniques. The system is process rather than product-oriented. Self and peer evaluation play an important role in the assessment process. Grades are seldom given. Feedback at all levels is a very important component of assessment. External stakeholders are invited to give feedback on the students’ practice films.

It became obvious during the site visit that all the parties involved in the delivery cooperate very closely and are dedicated to the teaching process to an unusually high degree. The level of trust between the teachers and students makes it possible to work constructively and openly and to provide criticism. Students and alumni have the feeling that teachers are very willing to listen to their comments and to make changes and improvements according to their wishes, if necessary.

4. Outputs

The student intake is extremely selective (for some programmes under 2%). Students are therefore very motivated. Some alumni have indicated that being accepted into the school equals being accepted into the film industry and almost guarantees employment. These might be some of the reasons for the very low number of dropouts. Most students have studied in some other degree programme usually at another higher education institution (sometimes even a complete degree) before entering the school. This results in the fact that they are more mature and are better aware of what they want when they start their studies, which is seen as a valuable asset. Furthermore, the number of completed PhDs is high for an artistic discipline.

According to the school’s alumni, the triangular model of teaching prepares the students well for everyday working life and the cooperation it requires. Many of the teams established in the school continue to cooperate in their later working lives.

The school has a unit that coordinates the participation in international film festivals and makes sure that films are entered into them. Many films have
won prestigious prizes at the national and international levels. The school also increasingly works on international co-productions.

The school’s alumni work successfully in their fields and often return to the university as visiting lecturers or to undertake PhD studies. They are all extremely happy with their qualifications and often employ other graduates from the school.

The fact that study times are long is not considered a problem per se. Firstly, the final thesis is usually a film and film financing and production usually takes a considerable amount of time. The school tries to rely less on external funding for this purpose, but resources are not high enough to guarantee funding from the school budget for every project. Secondly, students on master’s degrees are often already employed in the field and working successfully in film-making. This sometimes results in the fact that they do not finish their studies on time. The management is aware of the challenges posed by this and try to make sure that the students pass their degree.

5. Continual development

The school has some clear development plans. It is currently working on reforms to the curricula, the aim of which is to further enhance teaching. Students and external stakeholders are also actively involved in this process. Ensuring that the workload of the students is not too high is one focal point of these reforms. Teachers take pedagogical studies and frequently engage in dialogue on teaching or co-teach entire courses.

The school also hopes to be able to strengthen the QA system and its research. This includes making the transition between the degrees smoother, especially from master’s level to PhD. To ensure even closer contact with the labour market, there are discussions underway on getting alumni working in the field to act as supervisors of master’s theses more frequently.

The unit is engaged in enhancing its international reach and has plans to develop a new international Master’s degree (as a continuation of the former international Master’s degree, the financing for which has come to an end) and to undertake more international co-productions, as this is where the future of the film industry lies.

The school is also thinking about holding a workshop to clarify its common philosophy for the entire film school, which is something that is seen as essential to prepare for the future Aalto university and to determine its role within this new institution.
2.4 University of Helsinki, Department of Computer Science

Proposal for a Centre of Excellence in University Education 2010–2012

- The quality of teaching is safeguarded by systematic management of teaching.
- The guiding principle in the development of education is constructive alignment; the learning objectives, methods, materials and assessment all nurture each other.
- The department gives support to students’ autonomous efforts to develop their learning environment; the department provides premises for the peer support and IRC servers for peer consultation, and allocates direct funds for students’ own development projects.

1. Core duties of the department

The department and the background of the proposal. The department is renowned for its quality teaching and research; the Ministry of Education selected the department as one of the national centres of excellence in university education for 2007–2009. Furthermore, in the most recent research assessment exercise carried out at the University of Helsinki the department and the attached research unit were awarded the highest grades. The department also hosts one of the Academy of Finland’s national centres of excellence in research for 2008–2013.

Graduates work as experts in different areas in business or administration, in innovative development for the industry or in research and education in the field. The teaching at the department emphasises academic expertise: a capacity for conceptual thinking, acquiring and applying information, problem solving, continuous learning and producing new information. The wide selection of courses that the department offers provides the students with excellent opportunities to choose the best-suited area of specialization. Carefully analyzed core material, methods that encourage cooperation among students and student tutoring together provide a solid foundation for becoming an expert in the field.

This proposal has been drawn up at the department by the committee for the development of teaching in cooperation with the Head of Studies and the Head of Department. The committee for the development of teaching has a strong student representation. The department’s quality manual, its strategic plan for 2007–2009, a self-assessment manual for the management of teaching and a previous application for a centre of excellence in education (2007–2009) all provided background material for this proposal.
**Appropriate use of resources and development.** The department’s operations and its operational policy have been documented in detail in the department’s quality manual. The quality manual has been drawn up collaboratively by using wiki, and is a public document. In addition to the quality manual, the department’s staff policy and the personnel plan provide a framework for teaching. Teachers plan their overall teaching hours on the basis of the departmental norms, which take into account the hours spent on preparation. The hours spent on teaching have been standardized by an hourly rate of contact teaching and tutoring.

A large department makes it possible to organize work meaningfully. Although it might be useful in a short span to maintain the teacher-course bond, the department has a policy to give new tasks to new people at appropriate intervals. This decreases teacher-course dependence, and provides the teachers with new challenges. Varying the teachers’ responsibilities also promotes the collaborative development of course contents and methods. It has been possible for the department to employ junior teachers to assist the head teachers on large courses that involve studying in practise groups. The head teachers’ tasks involve group teaching too. This safeguards the quality of teaching, ensures the reception of feedback and provides the younger teachers with learning opportunities. Thesis guidance is systematically supported at the department. Guidelines are given on the duration of the guidance and on the responsibilities, both from the teachers’ and students’ point of view. Advisors keep record of the progress of the advisee in the thesis database, which enables the professors in charge of specific fields to follow the advisor-advisee ratio. This makes it possible to assure a better balance between students and advisors.

The department has a working principle according to which all researchers have a responsibility to teach as well. They participate in the teaching in their field of specialization by giving seminars or lecture courses, or – in the case of junior researchers – by teaching practise groups or by advising Bachelor’s thesis. Occasionally the junior researchers have been in charge of teaching at the basic studies level to get teaching experience. Researchers and postgraduate students also act as teacher tutors at the department. Teachers’ research work and professional development are supported with a sabbatical leave system, which enables a teacher – at intervals of a few years – to devote a full term on research or on development projects in education. In addition, most teachers have at least one period free of weekly contact teaching, i.e. half a semester per academic year.

Immediate superiors encourage teachers to develop teaching, and all teachers, including part-time and temporary teachers, take part in pedagogical training. The whole teaching staff has been provided with copies of the University Teacher’s Manual. A growing number of teachers have completed study modules in university pedagogy. The hours spent on further education are included in the total number of working hours. Each year the department organizes several train-
ing and theme days, and part-time teachers participate in training twice a year at the least. The key people in the development of teaching have all studied university pedagogy, and have frequently been invited to give lectures and presentations outside the department, at events dealing with university pedagogy or web-based learning.

Permanent teachers’ structure of office with their specified fields of teaching is based on the personnel plan of the department. Due to the nature of the field, locum posts are frequent. Temporary office-holders are usually appointed to their posts for the entire duration of the sabbatical, for an academic year at the least. Students that have advanced well in their studies can act as part-time teachers, in which cases the teaching hours are organized per each period in a way that does not hinder studies. The administration guarantees reasonable allocation of resources by taking into consideration the preferences of all part-time teachers concerning the amount and field of teaching.

The administration continuously recruits new promising teachers. The recruitment criteria are public: the qualifications (degree/success in studies), experience and aptitude. The department has been able to guarantee the continuity of the teaching positions of teachers who have done well in their studies. Pedagogical studies and teaching experience are taken into account in their recruitment too, as is the case with permanent teachers. At the end of each course, feedback is collected from the students and from the head teacher. The feedback is then reviewed in review discussions with immediate superiors and the Head of Studies.

The allocation of tasks at the department has been successful; according to the working atmosphere survey carried out in 2007 at the University, the department did better than average in all areas studied.

2. Planning of education

The curricula, the rational design of degree programmes, cumulative learning and the connection between research and education. The department is divided into three lines of specialization that are run by their head professors. The department also offers an interdisciplinary Master’s degree programme. Because of the fast development in the field, the department has frequently reviewed its degree requirements (in 2008, 2005, 1999 and 1994). Each line is responsible for planning the contents of its degree programme. The representatives of the lines also see to it that there is no unnecessary overlap between the three programmes. All the teachers and researchers, steered by the head professor, participate in planning the contents of the degree programmes. The content of the Bachelor’s degree programme is planned collaboratively between the three lines in such a way that the students are introduced to each area of specialization of the Master’s degree programme. The preparation of degree require-
ments involves department-wide discussions. The degree requirements are discussed in the steering committee at least once, as well as at staff meetings, before decisions are made.

Commitment to the contents of study modules is guaranteed by defining the learning objectives; these will restrict an individual teacher’s freedom to make changes to course content. A collective examination of learning objectives makes it possible to recognize the need for changes in study modules. The study modules are structured in a way that enables students to gradually deepen their knowledge within a specific area. The learning objectives clarify the interdependencies between different courses. These interdependencies are also described in detail to the students in a study timing model, which includes also recommendations on the sequence of courses. This structure of studies provides conditions for cumulative learning.

The lines are responsible for determining the focus areas of the research done at the department, which enables the combination of teaching and research in educational planning. The contents of the degree programmes are also in line with the curriculum work done by the international parent organization in the field. The guiding principle in planning the new degree requirements has been: 1) In the Bachelor’s degree, the students should have a common skills profile when starting the Bachelor’s thesis. 2) In the Master’s degree, when starting the Master’s thesis, the students’ skills profiles should cohere with the research done in the lines of specialization. The skills profiles specified for the Master’s degree provide a tool for educational planning and assure that learning is directed to the areas where the strongest research at the department is carried out. The social relevance of the research carried out at the department guarantees the relevance of the degree in the job market.

The skills profiles consist of the courses of particular subject matters. Course planning is based on conceptual wholes that are to be learned during the course. These conceptual wholes are called principal themes. The principal themes are presented in the learning objective matrices that also determine the requirements for previous knowledge on each principal theme. The matrices also describe a three-grade classification of learning objectives as follows: “approaches the learning objective” (the minimum requirement), “reaches the learning objective” (the objective set for the teaching), “deepens the objective” (introduces the subject matters dealt with in advanced courses). The description of objectives is based on Bloom’s taxonomy of learning objectives.

**Lifelong learning and working life perspective.** The introductory course at the department familiarizes the students with net-based and face-to-face cooperative learning. Throughout their studies the students are given personal study plan counselling (known as HOPS in Finnish), which enables the students to discover the methods and modes of learning that best suit their personal learning styles.
Several surveys carried out on the recruitment of the graduates show that the relevance of the degree in the working world is excellent as practically all graduates have been capable of finding work in the field. To improve the relevance of the degree in the working world, some of its practices have been applied in teaching too. One example is project studies. One such project involves an extensive production project where a group of 4–6 students plan and make a product in cooperation with a client. The clients come from companies, the department’s own research projects or other departments within the University. Most end-products of these projects are taken into real use, which is essential in motivating the students. The end-products are also presented to other students and to the department staff. Smaller individual and group work projects are carried out on the subjects of the core courses. In these projects the course boundaries are crossed over, as is the case with poster presentations and mini conferences that are open to all the students and staff at the department.

In order to strengthen the link between theory and practice students do projects during lecture courses too. These vary from planning or implementation tasks to usability studies and written analysis. Students with sufficient working experience in the field can be exempted from these projects on the basis of an experience account.

A colloquium course, organized at regular intervals, has proven popular and has attracted an audience of 150 to 200 students; the lecturers have been representatives of major companies in the industry and prominent researchers in other fields. The department has felt the pressure of taking the needs of the working world more into account in its programmes; but it has continued to adhere to its strategy and goal of extensive academic expertise.

Because of the international nature of the industry, the department also offers teaching in English, and the researchers recruited from abroad teach in addition to their research work. Visiting lectures and short courses given by foreign visiting lecturers are organized regularly (12 in all during the academic year of 2007–2008). The researchers working at the department represent some twelve different nationalities, and the number of foreign students is strong (exchange students in 2006, 20; in 2007, 25; degree students in 2006, 13; in 2007, 9). Teachers are encouraged to give teaching in a foreign language, and during the academic year of 2007–2008 the department organized 24 courses or seminars in English. Small group tuition is given in English when needed.

3. Implementation of education

Teaching methods and their selection. A committee for the development of education prepares the implementation of traditional and innovative methods and draws up a manual on them. The guiding principle in developing education at the department is constructive alignment. This means that the learning objectives,
methods, materials and the assessment must all support each other. The learning methods have been chosen to activate the students and improve the efficient use of time spent on studying. Adjusting to significant changes takes time and effort. The department has, however, worked persistently towards its goals and systematic studies are carried out on the effectiveness of its changes. One challenge the department faces is maintaining the alignment as the personnel changes.

Determined work on reforming the learning methods started in 2003. Since 2005 around half of the courses are based on peer support or on other student-centred cooperative learning methods. The aim is to provide graduates with professional skills such as good communication, an ability to share expertise and other skills needed in team work. The guided team work and cooperative learning methods that were implemented in teaching were soon adopted by the students, and became a dominant way among the students to organize studies; the students formed autonomous study groups outside the ones arranged by the department. The study groups strengthen students’ commitment to their studies and promote their study progress.

Learning objectives and assessment. In 2007 detailed learning objectives for all obligatory courses in basic and subject studies were defined. The objectives help the students to assess their own study progress and the teachers to plan their teaching so that is in harmony with the content of the other courses. The objectives have enabled the students to better identify the core themes of the courses and to assess their own progress in relation to the objectives set.

Development on learning assessment and assessment guidance for teachers started the same year. An assessment guidebook states that assessment should focus on the principal themes in the course contents and methods. During the courses students are given regular feedback on their progress. Self assessment, peer group feedback and ICT are used in giving and receiving feedback. The course examinations must be designed in line with the objectives. If the course consists of applied tasks, lecture notes can be taken to the course exam.

The use of ICT in teaching. The department started using information networks as part of the course arrangements as early as the 1980s. Email, file transmissions and news groups were used in internal communications. A news group set up for each course acted as a forum for discussions between teachers and students on the tasks given on the course. In the mid-1990s the Web was used as an integral part of the research and education at the department. In addition, different kinds of educational simulators and animators have been produced at the department in order to illustrate the subject matters being studied. To provide the students with immediate feedback on applied tasks, the department has also developed computer-based task checks. The most frequently used tools in the department’s net-based learning environment are Moodle, wikis and blogs. The department has its own Moodle server and support. In 2008 the most recent project, an implementation of a follow-up and reporting tool for the tutors
of web-based teaching, was started. In addition to that, the department maintains its own IRC server since the student association’s student tutoring and peer support mostly takes place through it. The majority of new students and almost all student-tutors and active members of the student association can be reached in real time through the IRC channel.

A great number of courses at the department are given as course using the Web alone. Since 2001 the department has organized online courses on the use of computers in education regularly. These have been based on cooperative learning platforms developed in the department’s own research projects. Lectures have been replaced by interactive tasks requiring creative and critical thinking, and by producing a joint blogosphere.

4. Results achieved

The teaching given at the department is widely appreciated at the University. Quality teaching does not, however, guarantee quality learning. Thus one of the major goals of the development of teaching has been to improve both the teachers’ and the students’ ability to assess their own performance. In order to reach this goal the learning process is made as transparent as possible, and it is constantly monitored. The learning objectives, which are made explicit and actively used in educational planning, also play an important role in safeguarding quality learning, as do peer group assessment and the surveys carried out at the department. The public criteria for assessing theses and the learning objective matrices also encourage quality learning.

The employment opportunities for the students at the department have been very good, and hence a great number of students have entered the working world as undergraduates. To encourage these people to continue their studies, the department has systematically developed the course contents and arrangements. In addition, special graduate clinics have been set up to help these students to finish their studies. The work carried out at the clinics consists of contacting the students, giving specialized counselling, making personal study plans and organizing thesis support groups.

Sufficient, flexible and versatile counselling has proven useful; the number of degrees taken in spring 2008 was more than threefold compared to the numbers from previous years although the increase in degrees is also partly due to the end of the transition period in the degree reform.

The administration and the committee for the development of teaching constantly monitor performance, reviewing student feedback, the distribution of grades and the number of failed examinations at the department. The effectiveness of the interventions have been studied and reported on at regular intervals. The studies have been carried out by an independent expert or by the teachers and planners at the department. In addition to writing internal reports, the teach-
ing staff has also carried out international research on the subject. Since the year 2000 some 50 papers have been published on student-centred learning and web-based learning.

5. Development of education

The Bachelor's and Master's degree contents are based on the strongest research carried out at the department, and on the vision the department has on in-depth and high-quality expertise. Teaching is managed through transparent and collective processes in which the objectives are set and responsibilities distributed in an explicit manner. The degree contents and the teaching methods are developed in department-wide discussions where the students participate too. The work done for the development of teaching is monitored systematically and reports are published on the progress. The results of the follow-up and the reports written are then used to further development work.

The Head of Studies has an important role in administration. The responsibilities of this full-time post include: the coordination of schedules, recruiting temporary teaching staff, writing and maintaining the instructions for studies, the follow-up of teaching on the basis of the systems developed at the department. The follow-up systems include, among others, databases for enrolment, course diaries and theses, and a web-based feedback system.

The committee for the development of teaching prepares development projects, coordinates them and organizes student tutoring and the teaching staff's pedagogical studies. A separate working committee for virtual teaching has focused on improving the conditions for this mode of teaching. A full-time employee continues to provide support for web-courses.

In developing the contents and methods of teaching, as well as in recognizing the problem areas, the feedback from students is of utmost importance. Feedback is collected in various ways, for instance in connection with personal study plan counselling, and through personal study plan portfolios, as well as in the teacher–student discussions organized during each term. Each study period has at its disposal a web-based form for receiving student feedback, which is then analysed by the course's head teacher. In addition to that, the Head of Studies follows the feedback, which is later reviewed in review discussions between immediate superiors and teachers. The feedback received is taken into account in teaching arrangements and in choosing teachers.

Student empowerment. In addition to the steering committee, students have representatives in the committee for the development of teaching, at annual strategy seminars, in the negotiations on the objectives with the faculty, at the events dealing with studying and in temporary working committees. Part-time teachers, being often advanced level students, also bring a student perspective into teaching and planning. The representatives of the student association have direct
and informal relations with the department administration. The department is involved in the planning of student tutoring and in the tutoring itself, together with the student association and the faculty. In addition to this, a department representative takes part in the student association board meetings in order to improve the communications between the department and the student association.

The studies have been structured to encourage cooperative learning. As a result of this, the students have become active agents in developing the learning environment and the quality of learning at the department. This student empowerment is seen as an opportunity and, as a consequence, the department has provided the students with premises and the aforementioned IRC server, in addition to allocating an annual 7,000 EUR to the student association, to be used for projects improving the learning environment. The first project carried out by the student association was setting up a web-based examination archive and developing a computerized self-assessment tool. The student association has also organized student-centred remedial instruction to support the official teaching given on courses. Peer teaching benefits all kinds of students – those with a learning disability and those who aim at in-depth knowledge. Judged by the number of students participating in peer teaching, it seems to meet existing needs that the traditional teacher-centred remedial instruction has been less successful in responding to.

Supplementary statistical and background information

The university proposes (circle the appropriate item) 1 Faculty 2 Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>209</td>
<td>232</td>
<td>169</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>2339</td>
<td>2328</td>
<td>2187</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>112</td>
<td>110</td>
<td>157</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>82</td>
<td>73</td>
<td>96</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>8</td>
<td>8,0</td>
<td>8,5</td>
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<tr>
<td>Credits completed by degree students in the unit</td>
<td>25682</td>
<td>22576</td>
<td>22321</td>
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### Postgraduate students

<table>
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<th></th>
<th>2005</th>
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<th>2007</th>
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</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>89</td>
<td>88</td>
<td>86</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>3</td>
<td>4</td>
<td>8</td>
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### Minor subject students (students from other units)

<table>
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<th></th>
<th>2005</th>
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<tbody>
<tr>
<td>Students, total</td>
<td>560</td>
<td>404</td>
<td>359</td>
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<tr>
<td>Credits completed by minor subject students</td>
<td>4868</td>
<td>3290</td>
<td>2951</td>
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### Other education provided by the unit

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<th></th>
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<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
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### Description of other education provided by the unit

2. **Structure of teaching, research and other personnel**

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<th></th>
<th>2005</th>
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</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>61</td>
<td>55</td>
<td>52</td>
</tr>
<tr>
<td>Professors</td>
<td>11</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>35</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Other personnel</td>
<td>38</td>
<td>47</td>
<td>56</td>
</tr>
<tr>
<td>Docents/Adjunct professors</td>
<td>26</td>
<td>33</td>
<td>36</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents)</td>
<td>48 hours</td>
<td>90 hours</td>
<td>48 hours</td>
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3. **Internationalisation**

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<tbody>
<tr>
<td>Foreign degree students</td>
<td>48</td>
<td>56</td>
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<tr>
<td>Foreign postgraduate students</td>
<td>11</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td>11</td>
<td>8</td>
<td>14</td>
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</table>

4. **Funding**

<table>
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<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>5366</td>
<td>5349</td>
<td>5294</td>
</tr>
<tr>
<td>External funding (1000 e)</td>
<td>3626</td>
<td>4224</td>
<td>4198</td>
</tr>
</tbody>
</table>

5. **Graduate schools and educational networks**

The department has coordinated two graduate schools (2005–2007) and, in addition, participated in two other graduate schools (2005–2007, 2007). All these activities continue.

The department has 11 funded and 16 adjunct student positions in these graduate schools (2008), total numbers in the coordinated schools being 33 funded student positions and 50 adjunct students.
6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

The department follows the graduate career and recruitment surveys commissioned by the university or carried out by the faculty, in addition to national statistics. According to the information gathered from these sources, the employment situation of our graduates is very good. Our awareness of the kind of jobs our graduates hold is also increased by the fact that our graduates are often involved in research projects carried out jointly with companies. Information of undergraduate placements is received from the reports evaluated in connection with granting credits for practical training.

Evaluation team’s feedback to the unit

1. Mission of the unit

The mission comes across well through the well-structured teaching and research strategy. The teaching/educational programme of the department clearly rests on a very solid pedagogical basis. It is also evident that the unit has had enough resources to ensure good opportunities not only for the students, and their follow-up, but also for the academic staff. One example of this is the system in which members of the academic staff – on a rotational basis – may devote longer periods of time to undertake research. This no doubt has positive effects on teaching at an individual level and on the entire learning environment. This is evidenced by the high number of teachers taking modules in university pedagogy and the generally high motivation towards teaching and concern about student learning.

Research and teaching are very well integrated and support each other. The level of external research funding is high.

The department seems to be highly attractive at the international level and has a high number of international graduate and postgraduate students. The atmosphere of the unit is very supportive and motivating. Students and staff cooperate closely both formally and informally.

2. Programme and course design

The development and the design of the curriculum is well-structured. The department has a good overview of the different programmes, and the staff are very committed. The bachelor’s level curriculum has a strong profile as well as the three lines of master’s programmes provided by the department. The students participate in the course design and the department has financially supported the student association in this work. Learning outcomes are well defined for all the modules, and the curriculum allows cumulative learning.
Specialisations have been developed through a model of research lines that allows a good combination of teaching and research. Project studies facilitate exposure to real life situations.

3. Delivery of education

Cognitive alignment is a concept adopted by the faculty to ensure the compatibility of learning outcomes, teaching and assessment, which seems a reasonable and very structured approach to the issue. Student-centred and cooperative learning approaches have been introduced. The faculty has developed an assessment guide book and also uses self-assessment and feedback mechanisms. The faculty also uses ICT in education in a way that seems to support the learning process of the students in a constructive way.

The balance between lectures, group work and project works is good. The department has started to develop its assessment system, and the panel encourages the unit in this development work.

4. Outputs

The employment situation is good and the faculty introduced a special programme to help students who have been hired while still studying to complete their degree. Study counselling has been introduced and seems to be a useful practice.

Long study times are due to the fact that the students are hired at an early stage of their studies. The department, however, supports these students and is flexible in ensuring that they graduate.

The department has good contacts with the sector through personal contacts and uses researchers from industry as part time teachers. Communication with actors in the sector seems to be regular and is beneficial to both partners.

5. Continual development

The discipline is in a state of continuous development and change, and the department has acted systematically in development work. The staff are highly committed to continuous development work and it also seems to be very systematic.

The department has continuously compiled information on the use of various teaching methods. Internationalisation in education has been identified by the department as an issue for further development. The unit may also consider involving external stakeholders in its development work in a more systematic way.
2.5 University of Helsinki, Faculty of Pharmacy

Proposal for a Centre of Excellence in University Education 2010–2012

- The development of education focuses on the strand-based curriculum. The Faculty’s strength lies in its close cooperation with the labour market and interest groups.
- In addition to the subject content of disciplines, the Faculty examines the teaching practices and educational solutions used in the field, the core content of instruction, as well as practices in working life.
- Despite its limited teaching resources, the Faculty has successfully created an enthusiastic environment for teaching and learning, achieved all of its degree objectives and satisfied the increasing need for employees in the field.

1. Core duties of the Faculty

The proposal for a national centre of excellence in university education has been jointly drawn up by the Faculty’s academic leadership, Academic Committee, divisions, Faculty Office and students. The self-evaluation report prepared for the international evaluation of education has been used as material for the proposal. The Faculty consists of six academic disciplines (divisions) and a multi-disciplinary research centre. The management and development of teaching and education are the responsibility of the Vice-Dean for academic affairs, who cooperates with the Academic Committee nominated by the Faculty Council, the committee’s working groups, the Admissions Board, the Research Committee and the Planning Committee. The committees and working groups include representatives of all the divisions, the Faculty Office and students. The organisation model emphasises cooperation between disciplines and active student participation in the Faculty’s operations. The faculty structure, based on divisions instead of departments, facilitates cooperation between disciplines and provides a good foundation for developing and implementing education in compliance with the principles of constructive alignment.

The Faculty promotes and complies with the University’s core values – critical thinking, creativity and the quest for truth – in all of its activities. The Faculty’s targets and view of the future are based on the foundation laid out in the University’s strategy, which has been adapted to the operations and development needs in the Faculty’s target programme, personnel policy and operations manual (i.e. the Faculty’s quality documents). Jointly made strategic decisions and development plans are put into practice as described in the action plans for teaching and research (for example, through research-based teaching).
The Faculty’s degree programmes prepare students for professional duties and lead to a Bachelor’s or Master’s degree, both of which have a clear demand in the labour market. Postgraduate studies lead to the Licentiate and Doctoral degrees. The Faculty also arranges specialisation studies in the field. The Faculty provides half of the Finnish undergraduate education in the field and has sole responsibility for the Master’s degree education given in the Swedish language. The Faculty has systematically developed constructive alignment and made full use of the opportunity, offered by the Bologna process, to reform the structure and content of the degree programmes. In the development of education, the Faculty focuses on implementing a strand-based curriculum and developing teaching methods that make students more involved in their own learning and the Faculty’s operations. Development work aims to promote the quality of students’ learning and their growth into professionals so that graduates will have a strong foundation for maintaining the expertise needed in their future work duties and for dealing with the challenges presented by postgraduate studies.

The Faculty’s teaching staff, including researchers and doctoral students, takes part in planning and carrying out instruction. Teaching resources are scant in relation to the number of students. Despite this, the teachers are enthused about teaching and its development. This is manifested in teachers actively participating in university pedagogy training; over one-third of the Faculty’s 120 teachers and researchers have completed courses and studies in pedagogy. The Faculty also encourages participation in the development of education as a part of postgraduate studies. Every year, a student, employee or working group distinguished in the development of education is rewarded with an honourable mention and trophy. Divisions and students can turn to the Academic Committee and apply for funding for projects focusing on the development of education. Students, teachers and the administration are currently drafting joint guidelines that clarify the rights and responsibilities of students and teachers.

To enhance interaction and meetings between teachers, the Faculty arranges Teacher Forum events, as well as teacher meetings at the campus level. The Faculty invites the whole staff to a morning coffee meeting with the Dean three times a term. The Faculty’s internal bulletin is also published at these meetings. Furthermore, the Faculty emphasises international activities: student and teacher exchange programmes, as well as the number of courses offered (internationalisation at home), have been increased especially in the advanced and postgraduate studies carried on with selected partner universities (London, Bath, Utrecht, Leuven, Sydney, Otago and Tartu). The Faculty’s teachers actively participate in joint international meetings in the field of educational development, where they present their own research results and take part in programme working groups and organisational activities. The International Professional Organization and Lifelong Learning congresses are the main forums for activities.
2. Planning of education

Thanks to the amount of time and resources allocated to designing and developing education, the Faculty now has a well-defined curriculum. The objectives for learning and degrees are jointly drawn up by the teaching staff, academic administration, students, pharmacy teaching units in Finland and abroad, as well as labour market representatives. Course objectives are defined in conjunction with curriculum core analyses and updated by the course coordinators at least once every three years. Teachers are also required to develop the content of courses and to enhance evaluation using curriculum core analyses and course feedback.

The main policies and objectives for education are prepared by the Academic Committee and approved by the Faculty Council. This ensures that full attention can be given to the staff’s opinions and that the Faculty can form a shared view. Guidelines are jointly discussed and the achievement of targets and the progress of the action plan are evaluated in the Academic Committee, the twice-annual student feedback meetings, as well as the Faculty’s development seminar for teaching and research. The divisions are supported in curriculum design by the lecturer specialised in university pedagogy and by the head of academic affairs, in the use of ICT for teaching purposes by the specialist in web-based education and in matters related to international studies by the international affairs officer.

Strand-based curriculum at the focus of the development of education

To decrease the fragmentation of studies, improve the integration of disciplines and reduce the surface-orientation of learning methods, the Faculty chose a strand-based curriculum design model based on the studies and surveys carried out by its teachers and students. The strength of the strand model stems from integrated study modules that span the Bachelor’s and Master’s degrees from beginning to end. These modules, called strands, are jointly designed and implemented by the different divisions. The goal is to integrate the disciplines into multidisciplinary modules, to promote scientific thinking, which students need to evolve into experts in the field, and to enhance professional growth, which provides students with the skills needed to enter working life after the Bachelor’s degree or to continue with the Master’s degree or further on to postgraduate studies. The goal is to bring the disciplines closer together and reduce the fragmentation of studies by steering students towards constructive deep learning. Training periods have been integrated with studies by emphasising the complementary nature of theoretical and professional learning targets.

The strand-based curriculum model is the Faculty’s main focus of development. In addition to comprehensive curriculum core analyses and study modules, future work will focus on the specification of degree objectives and their presentation as detailed learning outcomes. The Faculty participates in the Learn-
ing outcomes project, which aims to enhance the strand model so that systematically and comprehensively designed courses will form educational strands that progress fluently in terms of their content and instruction. This means, for example, that instruction in different courses must not include unnecessary overlaps and that teachers are familiar with the targets and content of other courses in the strand so that they can modify their own teaching accordingly.

In line with the University’s strategy, all researchers have a minimum teaching obligation. This ensures that the latest research data is also used in undergraduate and postgraduate studies. Moreover, research-based teaching benefits from close contacts with the labour market, which are used to develop the degree programmes. Scientific research articles are used as course material from the beginning of studies in order to enhance scientific thinking and language skills. Theses are an integral part of the divisions’ research projects. Starting with the final project for the Bachelor’s degree, students are steered towards academic process writing in which they get constructive feedback from their supervisors and peers. Master’s theses and doctoral research projects are carried out in the divisions’ research groups or in cooperation with interest groups, for example, in the pharmaceutical industry in Finland or abroad.

**Research and education cooperate closely with the labour market and interest groups**

In addition to pharmaceutical topics, research is also carried out in teaching practices, educational solutions and the core curriculum. The development of teaching is also affected by research related to workplace practices, which enables the Faculty to be closely involved in enhancing and steering the field in new directions. These research projects have involved many undergraduate and postgraduate students. Active interaction with national interest groups is emphasised in the implementation of education and research, starting with the number of new students accepted to the Faculty. To deal with the serious labour shortage that the field is suffering from in Finland, the Faculty has increased the annual student intake and carried out conversion training in the field. Interest groups were also interviewed during the degree reform when devising the objectives, content and revision needs of education.

The practical training period included in the study programme is a natural and important way for the University to interact with employers. This has been taken into consideration in the degree reform, the planning of training and the National Development Group for Training. Traineeship (six months in all) is an obligatory part of the Bachelor’s degree and has been systematically developed in recent years. Cooperation with employers has been enhanced and training has been integrated more closely with the Faculty’s theoretical education by establishing a working group for training and a post for a university instructor. The
success of training periods is monitored by collecting feedback from students and employers. Besides the obligatory amount of practical training, students are encouraged to seek opportunities for additional training in Finland or abroad.

The help of outside experts is also used in teaching. For example, during orientation studies, representatives of the field tell new students about their activities and students can interview professionals in the pharmaceutical sector. Students get a good overall view of education and work prospects at the early stages of studies. The strand dealing with scientific thought and professional growth has been selected as a special focus of development. The strand is jointly designed and implemented by the Faculty’s disciplines. It supports the development of scientific thinking, enhances professional identity and ethics, promotes professional growth and improves lifelong learning, including learning skills.

3. Implementation of education

The divisions, strands, course coordinators and individual teachers design and develop their teaching and are accountable for it. A lecturer specialised in university pedagogy works with the teaching staff to develop teaching and learning in the Faculty and to carry out relevant research and surveys. The lecturer is also involved in the Faculty’s in-house university pedagogy training in cooperation with the network for university pedagogy. Studies in the field are “school-like” in nature: most of the courses are common to all students, and the number of elective courses is small. The risk of this approach is that students adopt a passive role in relation to their own learning. However, the development of self-regulatory skills is required for students to continuously improve their competence once in working life. This is why students are introduced to self-guiding learning in study circles and to the evaluation and enhancement of their know-how with the help of, for example, tutoring, portfolio work and personal study plans. The Faculty has received good feedback from project work in which students carry out small-scale research in real-life operating environments. Teaching and practical training make versatile use of the opportunities provided by web-based education. The activeness of students has led to the introduction of a learning centre, which functions as an information search, group work and reading space that supports studies.

Educational solutions in the development of teaching

The Faculty has a large number of students in relation to the number of teachers. This poses the challenge of teaching in a pedagogically sensible manner. In addition to mass lectures, the Faculty uses teaching methods such as laboratory work, PBL, group teaching and learning, self-studies, peer support, computer-assisted simulation programmes, simulation exercises, case examples, activating lectures, practical training and web-based education. A specific form of instruction
as such does not guarantee the quality of instruction. Lectures are a cost-effective form of instruction and can be developed by introducing different kinds of teaching solutions that activate students. For example, using the Interactive Presenter system as a part of teaching and exam practices has given good results.

The evaluation of learning and suitable evaluation criteria were widely discussed in the Faculty in conjunction with the degree reform. Evaluation criteria and guidelines for the Bachelor’s and Master’s theses were also devised at this time. Curriculum core analyses also involve discussions about the compatibility of core curriculum, learning objectives and assessment of courses. The learning objectives are listed in the online course catalogue and are always explained at the beginning of each course. The evaluation matrices for theses are discussed when initiating thesis projects. The student’s and supervisor’s expectations and learning objectives are also reviewed in this context. References to the matrix are made as thesis work progresses. Discussing the evaluation criteria with students has been found to be a good practice and to have made evaluation more transparent. The goal is to support deep learning and to help students understand bigger entities. Since evaluation practices have a big impact on learning, the Faculty has developed exam practices that emphasise the application of information and analytical thought. Evaluation methods vary depending on the course and may include, for example, practical exams, “cheat-sheet” exams, essays, pair exams, work reports, oral exams, IP exams and seminars. In essays and reports written independently or in groups, assessment is an integral part of the learning process. The goal is to increase self-evaluation and peer evaluation, as well as the assessment of learning in groups.

By developing and flexibly using evaluation methods the Faculty aims to promote students’ learning and their ability to apply information. However, evaluation methods can still be improved a great deal, and further attention must be paid to teaching methods. In some courses, evaluation focuses too heavily on remembering information instead of understanding and applying it. Curriculum core analyses could be used more effectively as support when planning evaluation. In the future, the Faculty must give more attention to ways in which evaluation as a whole could provide better support to the students’ learning process. Students consider evaluation practices to have improved and to be developing in the right direction.

4. Results achieved

The Faculty achieved all of the degree requirements set by the Ministry of Education and the University in 2007. Full achievement of the requirements in both Master’s and doctoral degrees is an indication of the Faculty’s education being effective despite the unfavourable student-teacher ratio in the Faculty and its disciplines. The field is characterised by the excellent employment situation of re-
cent graduates. In the 21st century the Faculty has also offered conversion training for nearly 200 holders of Bachelor’s degrees. This has been of great assistance to society and the labour market.

Overall, the quality of instruction and related development measures are considered to be good in the Faculty. Education is of a high quality also from the students’ point of view. The Faculty pays exceptionally great attention to actively engaging students in the development of teaching. Internationally, the content of degrees and the development of teaching is usually the sole responsibility of teachers of education. Deep learning and integration of scientific-theoretical and professionally oriented course content pose challenges to the development of the content and methods of education. The Faculty’s goal has been to manage its development activities in a systematic way so as to increase cooperation between disciplines and promote the distribution of educational innovations, as well as to enhance the self-evaluation of activities and encourage student participation in the development of teaching.

The quality of the development of teaching carried out in the Faculty is attested to by the awards that the Faculty’s teachers have received for their instruction, the project funding received from the University and foundations, the University’s Quality Award for teaching in 2006 and the University’s Centre of Excellence award in 2007–2009. According to the feedback from evaluation, the Faculty has taken an exceptionally systematic approach to the management and development of education.

5. Development of education

The Faculty has worked hard to identify and rectify problems using, for example, surveys, joint discussions and dissemination of information. The degree reform was based on a student survey of studies and on an international evaluation of teaching in the field. Doctoral research projects on practical training and the integration of studies and working life have offered a solid foundation for developing degree programmes and the strand model. Students have made a considerable contribution in this respect. Recent research has focused on the entrance examination and initiation of studies of first-year students and on the experiences of third-year students concerning the achievement of degree objectives after the practical training period. The results will be used to develop student selection and teaching in order to further enhance the development of students into professionals in their field. A survey was also conducted among students who were aiming at a Master’s degree but whose graduation had been delayed. Based on the survey results, the Faculty set up a peer support group led by a counseling psychologist, which aims to help students to complete their theses. Course feedback is collected from students at the end of each term. The identified needs for development are discussed at joint feedback events for teachers and students.
Giving, receiving and using feedback are important to the learning process and to the development of teaching. This has also become clear to teachers. There are many suitable ways to collect, analyse and use feedback on teaching – at the teacher, strand, division and Faculty levels. Feedback gives information about the quality of teaching and any needs for development. Students have the opportunity to review and discuss their exams and model answers with the teacher after the exam. Students and teachers have found the publication of model answers on bulletin boards or online to be a good practice. Students get personal feedback on exercises and reports, laboratory and small-group work, practical exams, training, final project work, theses and their personal study plan. Feedback on practical training is collected from both students and employers. Teachers, in turn, give counter-feedback, including further development measures, on the students’ course feedback. Feedback is jointly discussed also at the twice-annual event for teaching feedback. The Faculty’s web-based feedback system has been developed to better serve the needs of the academic leadership, teachers and students. The utilisation of feedback must be further enhanced to offer real added value to the Divisions and strands. Feedback given to students should also be increased. The Faculty’s Academic Committee evaluates the implementation and results of teaching based on feedback collected from selected courses. The functionality of the degree programme has been assessed with a learning experience survey, coordinated at the University level, which the Faculty now uses on a regular basis to evaluate teaching and to support the students’ personal study plan activities. The assessment of the impact and success of the degree programme is based on the University’s Teaching Evaluation Matrix.

It is important to monitor learning and to collect and use feedback to further develop degree programmes (including the strand model) in a field in which students find it difficult to achieve deep learning. The Faculty carries out research in university pedagogy in cooperation with other faculties. This makes it possible to compare results between disciplines and to get important and topical information about teaching and learning at university level.
Supplementary statistical and background information

The university proposes (circle the appropriate item) 1 Faculty 2 Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>269</td>
<td>249</td>
<td>201</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>909</td>
<td>848</td>
<td>881</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>150</td>
<td>193</td>
<td>166</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>39</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>5,5</td>
<td>6,0</td>
<td>5,5</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit</td>
<td>33100</td>
<td>37288</td>
<td>30852</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>101</td>
<td>101</td>
<td>104</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>4</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>8</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor subject students (students from other units)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students, total</td>
<td>114</td>
<td>244</td>
<td>243</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>961</td>
<td>1317</td>
<td>1419</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other education provided by the unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Description of other education provided by the unit**


The Faculty also arranges industrial specialisation studies for holders of a Bachelor’s degree. The credits completed in the framework of these studies are included in the Faculty’s total number of credits.
2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>92</td>
<td>102</td>
<td>105</td>
</tr>
<tr>
<td>Professors</td>
<td>12</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>32</td>
<td>33</td>
<td>30</td>
</tr>
<tr>
<td>Other personnel</td>
<td>36</td>
<td>39</td>
<td>43</td>
</tr>
<tr>
<td>Docents/Adjunct professors</td>
<td>50</td>
<td>49</td>
<td>53</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents)</td>
<td>41 hours</td>
<td>159 hours</td>
<td>159 hours</td>
</tr>
</tbody>
</table>

3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students</td>
<td>12</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Foreign postgraduate students−</td>
<td>5</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td>9</td>
<td>13</td>
<td>18</td>
</tr>
</tbody>
</table>

4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 €)</td>
<td>5052</td>
<td>5390</td>
<td>6109</td>
</tr>
<tr>
<td>External funding (1000 €)</td>
<td>2892</td>
<td>3839</td>
<td>3916</td>
</tr>
</tbody>
</table>

5. Graduate schools and educational networks

**Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years**

The Faculty runs a national graduate school in the field. It has been active since early 1998.

The Faculty and a faculty from another Finnish university take turns in coordinating the graduate school’s operations:


6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

The employment percentage is estimated to be 100%. The field enjoys a very good employment situation at the moment: the unemployment rate among graduates was around 1% in January 2007 (according to an employment survey carried out by the Confederation of Unions for Professional and Managerial Staff in Finland in 2007). The demand for a larger workforce is on the increase, as the big age groups near retirement age. In the feedback on studies and working life collected by the University’s career services in 2006, only one respondent with a degree from the Faculty reported being unemployed at the time (the response percentage was 19.3). The Faculty actively cooperates with employers in curriculum design and traineeship and takes surveyed workforce needs into consideration when determining the annual student intake.
Evaluation team’s feedback to the unit

1. Mission of the unit

The application presents a very clear and precise description of the faculty and its teaching programme.

The mission and strategy are clearly integrated with those of the university. The unit demonstrates a strong commitment towards teaching and a focus on the pedagogical development of its staff, as demonstrated by the annual faculty award for distinguished achievement in educational development.

The faculty has close cooperation with the labour market and other interest groups. It is also an active participant in both national and international activities in education.

2. Programme and course design

The new strand-based curriculum design model, together with the use of a lecturer specialised in university pedagogy, is effective in meeting the needs of student learning and teaching. It has been systematically developed over a very long period of time and implemented through a process involving both students and external stakeholders. The objectives of the strand-based approach – to integrate the disciplines into larger multidisciplinary modules and to improve progression through the curriculum – have been successfully achieved. The model also encourages interlinking between discipline divisions in the faculty and in the educational process. However, the panel discovered that internal organisational structure can sometimes inhibit information flow.

All courses have clearly stated objectives, and learning outcomes are in the process of being defined. Teaching clearly draws on research. The faculty could, however, strengthen the degree to which research is interlinked with teaching. The faculty organises regular meetings with the whole staff and dean as well as students to discuss development issues. Employer input occurs through e.g. research projects, theses and meetings with professional associations, and other informal staff contacts. Contacts with external stakeholders might be organised on a more systematic basis.

The faculty plays a significant role in lifelong learning, especially through conversion training and provision of specialist professional training.

3. Delivery of education

The use of core curriculum analysis to ensure a good balance between teaching, studying and assessment works well. Teaching and assessment methods are varied, and outside experts are a notable feature of teaching. However, the
methods used still seem to be comparatively traditional, and decisions on their use are made by an individual course teachers. There is scope for further development here.

Staff are supported in a range of pedagogical training and research, and there is dedicated funding for this. Take up of this support is at the discretion of individual teachers. The panel recommends the unit might encourage more staff to undertake subject specific pedagogical training and development.

The students appreciated the flexibility of the virtual learning environment.

4. Outputs

The unit clearly produces good outputs, as particularly demonstrated by its high level of external funding. The pharmacy labour market is extremely buoyant. The employment of graduates is 100%. External stakeholders confirmed that the faculty puts significant effort into ensuring that graduates are well prepared for professional life. Students are particularly well versed in the interpersonal and social skills required of today’s pharmacists.

5. Continual development

The unit has clear long-term development orientated action plans to put its strategy into effect.

The faculty has for a number of years been developing the practical training placement. The traineeship is now very effectively integrated within the programme, with students being fully prepared and supported throughout to gain maximum benefit. The panel noted in particular the development and use of the work book in practical training. Teaching pharmacies are also fully supported with training and networking opportunities. The faculty employs a full-time internship coordinator, who also works in cooperation with other Finnish pharmacy faculties.

Student feedback is used by the faculty in developing teaching and the curriculum. Some teaching staff discuss with students the overall feedback outcomes and actions to be taken. This could be undertaken on a regular basis for all courses.

The panel was impressed with the range of published studies on pharmacy curriculum development by members of the faculty, and would encourage greater application of the findings by teaching staff.
2.6 University of Jyväskylä, Department of Physics

Proposal for a Centre of Excellence in University Education 2010–2012

DEPARTMENT OF PHYSICS – STIMULATING LEARNING ENVIRONMENT

1. Mission of the unit

The Department conducts scientific research in pure and applied physics and gives research-based education. Its teaching programmes produce researchers for the scientific community, teachers for schools and experts for a diversity of tasks in the industry and elsewhere in society. In both research and education the Department aims at excellence at a high international level. At present the Department has one national Centre of Excellence status in research. Regarding the number of MSc and PhD degrees produced, the Department belongs to the most productive units in its field in Finland.

The educational and pedagogical mission of the Department is to provide our students with a solid and wide professional training in physics. Particular aspects we pay attention to in our instruction include: 1) We support and facilitate our students in their growth to become members of the research and teaching community of the Department and the scientific community. Students are expected to participate in the activities of the Department, starting already in the early BSc stage of their studies. 2) We stress problem-solving skills as a key element for their education and future employment. The MSc studies contain more than a thousand problem solving tasks with increasing challenges, from straightforward calculations to laboratory exercises and research projects, which train the student to grasp the essence of complex situations and how to handle them. 3) We guide our students to appreciate the fact that interaction and collaboration are essential parts of the working culture in the field of physics. At the Department these skills are systematically developed and team work is promoted throughout the studies.

Working community. The personnel are strongly committed to the educational mission. Teaching is seen as a central activity of the Department and good instructing of students is considered as a rewarding challenge and absolutely essential for the future of the research groups and the Department as a whole. Teaching and research are not perceived as separated activities, but every researcher is expected to participate in teaching and also there are no positions devoted purely to teaching. There is lots of interaction among students and also between
students and teachers in the open and friendly atmosphere, which is a cherished characteristic of the Department. Teaching and how to improve learning is one of the favourite topics of coffee-table discussions among our personnel and students.

**Contact with research.** The Department is strongly promoting the interplay between the frontline scientific research and high-quality teaching, not only from the point of view of the scientific substance but also in the learning processes. This development greatly benefits from close connections kept to two large research facilities, the Accelerator Laboratory and the Nanoscience Centre, where a large fraction of the Department personnel works. The Department hosts two hundred international visiting scientists every year. Researchers, both visiting and permanent, give lectures, work as course or laboratory assistants and supervise research projects of the students. The MSc and PhD thesis projects constitute a major part of the actual work done in the research groups and also provide for the way to transfer practical knowledge and responsibility at the Department. The interplay between basic research and the applications of physics is also realised in multidisciplinary programs such as the recently launched international MSc programs in nanoscience and renewable energy.

**Challenges and resources.** Intentionally, the research and teaching duties are not separated in order to guarantee the sufficient teaching power in the research-oriented Department. All researchers, when allowed by their funding agents, contribute to teaching and student supervision. This facilitates the extensive use of laboratory work with front-line research equipment as part of the studies, which otherwise would be prohibitively expensive to arrange. One of the central challenges is to attract students with high motivation and the potential required by the high demands of the studies. The importance of physics in other fields means that a substantial fraction of registered students use physics studies as a springboard to prepare themselves for admission in areas like medicine or engineering, without obtaining a physics degree. Due to the systematic development of teaching and recruitment to reduce unplanned dropping-out for other reasons, the Department has succeeded in reaching its official goals in the number of graduates produced.

**This application.** This application was prepared within the Teaching Development Committee of the Department. It consists of the Head of the Department, the Head of the Pedagogical Development of the Department, two professors, a lecturer, a senior assistant, a PhD student, an MSc student and the Departmental Administrator. During the process the draft of the application was also referred to and commented by other personnel and students.
2. Programme and course design

**Learning outcomes.** The learning outcomes of education at the Department are very diverse in nature, including skills in physics and more generic skills. In addition to a knowledge structure of physics, the graduates have learned critical and creative thinking as well as communication and group working skills. The study units are designed to produce coherent and extensive knowledge, to enhance the problem solving skills in different kinds of working environments, communication and teamwork skills, practical skills and mastery of available technology. A key learning outcome is the researcher’s approach to different kinds of job assignments. In working life, the graduates are supposed to have confidence in their abilities and competence to contribute within wide range of professions.

**BSc degree.** The structure of the degrees given by the Department was renewed recently within the Bologna process. In general, the core substance of physics at the BSc level is quite well established and universal even internationally. The physics studies were designed to be, with the exception of a few courses, common to all physics students, including those aiming at teacher qualifications. The amount of physics coursework during the first two years is about twenty percent less than in the earlier degree system, which is also reflected in the credit accumulation in physics. In the renewal process, key content areas and their connections were first identified, after which within each content area the key substance and learning outcomes were defined, together with an analysis of the workload. In spite of the highly cumulative nature of the knowledge structure, there is flexibility in the way things are presented and learned, allowing for realisation the educational mission of the Department. In particular, to facilitate team work and at the same time to guarantee the prerequisites, the backbone of the degree was designed to contain only one physics course at a time, accompanied by a sequence of methodology courses. The last stage in the process was to make the study units to fit the four-quarter semester system and the two-stage degree system.

**MSc degree.** At the MSc stage the students choose their field of speciality. The various MSc programs of the Department are built to respond to the needs of the scientific community and the surrounding society. To maintain job market relevance of programs, in particular of those related to the industrial applications of physics, outside experts are actively involved in the development. To this end, also the employment of the graduates is very closely monitored, as discussed below. One of the cornerstones of an MSc degree is the minor subject studies in some other field of science, where a different approach to science is absorbed. Close contacts and collaboration with other Departments in the Faculty have been essential in developing the minor subject study packages that best complement studies of the major subject.
**PhD education.** The PhD education offers the most specialised knowledge and skills required to analyse complex research problems of a given field and to contribute to it. The Department is either a coordinating party or a partner in several graduate schools. Within the graduate schools, students follow their individually planned studies, but the level and amount of coursework is common for all students. Topical PhD courses are constantly developed to respond to the increasing diversity of the needs in the job markets.

**Teacher education.** The teacher education is organised together with the Department of Education and the Teacher Training School, the responsibility of the Department being the physics subject content. It is considered important that the teacher education is also closely connected with research. The contents of the BSc-level studies in physics are therefore identical for teachers and researchers. Many teachers obtain qualifications in both research and teaching, often by preparing their MSc theses on basic research topics. Moreover, research in physics education is promoted at the Department and related to this activity there are physics courses tailored for teacher studies.

**Lifelong learning.** The BSc level was planned to be non-specialized and contains methodology studies, so as to provide students with a strong basis for lifelong learning. To stress the generic skills needed in physicist’s profession and in maintaining expertise in the rapidly evolving field, a course entitled *Physicists in working life* has been developed. Lifelong learning is facilitated also by emphasis put on right learning habits and diverse learning skills. English is widely used for scientific and technical communication during the studies, and the student exchange provides further possibilities to enhance communication skills. The Department is active in the supplementary education in collaboration with the Open University. Graduates are invited to the Alumni Days arranged every five years.

### 3. Delivery of education

#### 3.1 Learning environment

**Integration of students in the Department.** We see the whole Department as a learning environment and students as part of the working community. The integration of students starts from their first day as physics students with the *Flying start*, a two-week crash course in today’s physics. The new students are divided in small groups of less than ten, guided by good and enthusiastic fourth-year students with good social skills. The groups work together to solve problems related to the subject matter of each day of the course. During the course, teachers and researchers as well as PhD students from the research groups present the latest research in their field and tell about their daily work as physicists. Time is also devoted to the applications of physics in the industry and the job market for physicists. The course ends with an informal dinner. After the intensive start, on
the regular full-semester courses, working in small groups is strongly promoted
and the lecturers and the teaching assistants are actively present in the everyday
work of the students through supporting their learning of physics and adopting
the open and interacting study culture of the Department.

**Department as a learning environment.** The learning environment in-
cludes lecture rooms, student laboratories, research laboratories and the comput-
er classes. In addition, one lecture room has been converted into an open work-
ing space for students. It is located at the heart of the Department increasing the
natural interaction of students and personnel. The office doors of the personnel
are open to students all the time. A particular strength of the Department is the
research laboratories and a well-equipped workshop. There students get expert
supervision in their exercises and projects and can take part in the building of
experimental apparatus, which has been recognized as one of the cornerstones
of the good employment for our students after graduation. The supervisors in
the student laboratory are active researchers and graduate students. During the
BSc stage, most laboratory exercises are integrated in the lecture courses to main-
tain the presence of practical aspects throughout the studies of the theory frame-
work. A study culture, new in the field, has been developed where even for BSc
students the Department is not merely a corridor to the lecture hall.

**Contact with research.** The students get acquainted with the work of the
research groups already during the first weeks of their studies. The three main
research areas of the Department are reflected in the curriculum: The students
take at least one advanced course from each area. In the advanced laboratory
study unit, the students choose laboratory exercises from three different areas of
physics The Department has an extensive summer training program with rough-
ly 50 students each year and also the most of the theses are prepared within our
research groups.

### 3.2 Teaching

**Teaching approach.** We encourage contact between students and personnel;
promote reciprocity and collaboration between students; use different learning
modes including problem solving and immediate feedback; agree with students
on high standards; and recognize diverse talents. Research-based teaching and re-
search-based teaching methods are combined, as are the development of prob-
lem solving skills and problem-based learning. The traditional teaching frame-
work consisting of lectures, tutorials and laboratory exercises are diversified by
new methods. Working in small groups and co-operative learning are used to
provide a stimulating, enthusiastic and intellectual environment and, at the same
time, individual hard work is required and rewarded. Spontaneous group forma-
tion is encouraged.
Assessment. The assessment methods used reflect the diversity of the desired learning outcomes. For most courses at the BSc level it contains the assessment of knowledge, problem solving and experimental work. In addition, the students can get points in the assessment from the course evaluation and the associated self evaluation. From their laboratory exercises, project works and thesis the students also get a detailed assessment on various aspects of their written reports. In many new courses, learning logs are used. The open and easy communication in the learning environment provides a fast and informal two-way feedback path between students and teachers that promotes improvements in teaching through rapid and efficient correction to learning difficulties.

Teaching arrangements. The allocation of teachers to courses is decided by the Teaching Development Committee. Experience has shown that the first courses of physics are the most difficult ones to be taught well and the most qualified teachers are used for them. The teaching at the BSc level is given in Finnish, except a few courses given by English-speaking teachers. At the MSc level, lectures are in English, whenever there are English-speaking students in the class. The textbooks are in English. The supply of new items is constantly surveyed in order to find the most modern textbooks for use. To promote the use of literature the Department donates the first-year textbook by Young and Freedman to all physics majors.

3.3 Support

Student recruitment. The recruitment is based on the good reputation of the Department as a place of study. We actively work to attract students with good motivation and capability. It is seen that physics education starts already at school, and we therefore maintain close contacts to and co-operation with schools. The Department trains and sends its students to visit high schools in order to advertise physics studies. A special course on topical research subjects is given in local high schools and a laboratory course is held for high school students in the Department laboratories. The Department presents popular demonstrations in the Science Fair of the University. The Department also organizes preparatory lectures for the school groups visiting CERN and trains the Finnish Physics Olympic team. The Accelerator Laboratory and the Nanoscience Centre are popular excursion destinations for school groups.

Counselling. Comprehensive information on physics studies has been made available on the Department web pages and in the electronic course management system. At the same time the Department has increased resources for personal counselling to respond to the challenge of the increasing heterogeneity of the background and the professional goals of the students. Personal study plans have been in use for a long time and are now made in a web-based system pro-
vided by the University and that was piloted by the Department. Within it the students can make a study plan visible to the study advisors, tutors and their thesis work supervisors. It facilitates easy review and revision of the plan. For PhD students, a half-way evaluation is arranged, where the student gives an informal seminar, and the progress of the PhD thesis research and the studies is reviewed.

**Distance learning.** For students doing coursework remotely, most course materials are made available on the internet. It is possible to return solutions to problems electronically and all teachers can be contacted via email. Students with different kinds of background and life situation complementing their earlier studies towards an MSc degree are supported by flexible teaching arrangements. Some courses are given and laboratories are open in summertime and also in the evenings and weekends. Other learning support, such as hints to the problems in blog or wiki pages, are being experimented with.

### 4. Outputs

**Requirements.** Physics is a demanding field that requires a good grasp in the diversity of natural phenomena, the ability of conceptual thinking, and skills in mathematical and computational methods. Its application in technology is often as challenging as the fundamental aspects. The level of the knowledge and skills required are thus necessarily high. To guarantee the success of our graduates in working life, we systematically seek to raise the quality of the degrees.

**Admission and official goals.** Due to extensive co-operation with schools and the reputation of the Department as a place of study, the common international trend of a diminishing number of enrolled physics students has been avoided. At the quantitative level the official goals set by the Ministry of Education are achieved, and in MSc production the Department has become one of the leading units in the country. The number of unplanned drop-outs has considerably decreased during the last decade and the median duration of studies to MSc level has decreased from about 6 to 5.3 years.

**Quantitative vs. qualitative output.** The employment record of our graduates is good. A particular strength is their experience in team work and in working in an international research environment. The balance between quantitative and qualitative output is monitored through student response and close contacts in their working life. The usefulness of students’ knowledge is largely measured by the employment of the graduates and their satisfaction with the education. The labour markets are constantly followed by collecting information from the recently graduated on employment and on their experiences about the relevance of their studies in the labour market. The coverage of the annual questionnaires for graduates has been over 90% for 1995–2007. Not all graduates will identify themselves primarily as scientists or physicists in their workplaces after gradua-
tion, but according to the surveys, in a long run they attach a high value to the research education side of their studies and the researcher’s approach to problem-solving they have learned.

5. Continual development

Teaching development. The courses and curriculum are under constant scrutiny and development. The students participate in this work at various stages, as members of the Teaching Development Committee, the Department Council and the Faculty Council. The selection of special courses is dynamic and good use is made of the research personnel, who are encouraged to suggest topical courses in their fields. For each year’s teaching programme, the students are asked to present wishes for the courses. New study units are developed, often initiated by the student response, like recently the courses Physicist in the working life and Researcher’s toolbox. Also the Flying start, launched in 2001, has been under a continuous development and its delivery of the fall 2008 will be already the third renewed version of the course. Many teaching development projects form the basis of thesis works of students in teacher education. The involvement of research staff in teaching enables informal benchmarking of teaching practices and learning outcomes with the best international universities during research visits. The transition period into the Bologna system is ending this summer and, after the first experience of it, work is now in progress to develop the next version of the BSc degree for the academic year 2009–10.

Course evaluations. Course evaluations have been used extensively for over ten years in the development. Together with a course questionnaire, the students also fill out a self-evaluation form, which in addition to reflection, provides information for the development of learning on each course. The teacher discusses the response with students before the end of the course. The teachers are also asked to write a so-called Lecturer’s testament. The course evaluations are developed and conducted in collaboration with the students association.

Critical points of education. The critical points are identified using the information gained by the study advisors in follow-up discussions of study plans, by monitoring students’ annual credit accumulation, by questionnaires to the students and from enquiry into unplanned drop-outs. Overall, the most critical points are the first semesters, during which the nature of physics as a challenging discipline turns out to be a surprise for some students, the third year when the students decide their specialization or the choice of the MSc program and the initiation of the work required for the master’s thesis. For these points, the Department has developed special study units and increased guided training opportunities as discussed above.
Pedagogical development. Pedagogical training of the teaching personnel is encouraged. Many lecturers of the Department have formal school teacher qualifications. The Department arranges on a regular basis workshops and seminars on teaching issues, where the possibilities and facilities available for the development of the teaching are discussed. Open theoretical and experimental exercises, in contrast with traditional ones with a fully defined assignment problem with prescribed means of solution, are being increased. Research on physics teaching has been initiated at the Department and is utilised in the development. For the next few years, the development theme is to increase the interaction in the lectures. Approaches to further reduce the amount of lecture hours and to increase the hours reserved for other modes of teaching are under will be tested on selected courses during the next year.

Recruitment. We have developed our admission procedures to better make use of the separate physics test in the recently renewed national matriculation examination. The first experience of this has been very promising. In the fall 2007 the Department got better qualified students than before and the first indications for the fall 2008 look similar. While the national policy is to diminish the role of separate entrance examinations, an interview of applicants probing their motivation is under consideration at the Department. A challenge typical to the field is how to attract more female students. Unfortunately, the new matriculation test appears to worsen the gender balance. For this reason we are developing further our co-operation with schools and the recruitment materials to smoothen the image of physics as a hard and technical discipline. We expect also our new master programs in Nanoscience and Renewable Energy to make physics studies more attractive.

Impact. The development of education at the Department is widely recognized. The Department has played a central role in the degree development at the Faculty level and beyond. For example, we coordinated the national working group of the Bologna process of the Physics Departments in Finland. The Department has earlier been nominated a Centre of Excellence in University Education, and the student support arrangements in the Department and the Flying start have been used as a model of good practices within the University and at other Physics Departments throughout the country.
Supplementary statistical and background information

The university proposes (circle the appropriate item) 1 Faculty 2 Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>86</td>
<td>81</td>
<td>105</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>577</td>
<td>531</td>
<td>524</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>46</td>
<td>38</td>
<td>49</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>5,3</td>
<td>5,3</td>
<td>5,3</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit</td>
<td>10644 ects</td>
<td>9293 ects</td>
<td>8895 ects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>82</td>
<td>85</td>
<td>87</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>8</td>
<td>14</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor subject students (students from other units)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students, total</td>
<td>196</td>
<td>197</td>
<td>176</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>2657 ects</td>
<td>2353 ects</td>
<td>1668 ects</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other education provided by the unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td>290</td>
<td>146</td>
<td>149</td>
</tr>
</tbody>
</table>

Description of other education provided by the unit
Laboratory course for high school students at the department laboratory.
Numerous visiting lectures in local high schools.
Studies of exchange students and studies in supplementary education.

2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>31</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>Professors</td>
<td>12</td>
<td>12</td>
<td>13,5</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>19</td>
<td>19</td>
<td>16,5</td>
</tr>
<tr>
<td>Other personnel</td>
<td>129</td>
<td>135</td>
<td>132</td>
</tr>
<tr>
<td>Docents/Adjunct professors</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents)</td>
<td>2 %</td>
<td>2 %</td>
<td>2 %</td>
</tr>
</tbody>
</table>
3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Foreign postgraduate students</td>
<td>15</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>5800</td>
<td>6300</td>
<td>7400</td>
</tr>
<tr>
<td>External funding (1000e)</td>
<td>4300</td>
<td>5000</td>
<td>4500</td>
</tr>
</tbody>
</table>

5. Graduate schools and educational networks

**Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years**

- National Graduate School in Nano Science (c) 2005–2007
- National Graduate School in Particle and Nuclear Physics (c) 2005–2007
- National Graduate School in Materials Physics (p) 2005–2007

6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

Department sends questionnaires annually to all graduated (response/coverage has been over 90% in 1995–2006 and the results are published in the www) providing information on placement, job satisfaction, job market relevance of the education and suggestions for further development. Also the alumni days organized every 5 years provide information. In addition, some general placement information is collected by the university administration.
**Evaluation team's feedback to the unit**

1. **Mission of the unit**

The department has a very clear mission statement in terms of its teaching, research and productivity. There is a very strong link between teaching and research in the department. Virtually all the researchers teach and all the teachers are involved in research as well. Teaching is seen as the central activity of the department.

The unit has strong and systematically developed teamwork that involves all the groups (teachers, administrators, students, external stakeholders). There is an open culture of communication and cooperation. This is also enshrined in the way the application was prepared, namely by a group comprising all the different stakeholders in the department. The department creates a strong international environment and has a high number of foreign students and personnel.

The department seems to have a strong and well-functioning international network as well as links to research centres, and is involved with other units in the faculty and the university in multidisciplinary programmes, such as in nanoscience and teacher training.

There is a considerable number of students who change subject, although the level of “unplanned dropout” is low. The department knows in most cases why students drop out and where they go to, e.g. studying physics to prepare for medical school or engineering.

2. **Programme and course design**

The department seems to have undergone a well-organised and thorough reform process. Learning outcomes have been defined on the basis of an analysis of content areas in physics. Furthermore, different profiles for bachelor’s and master’s degrees have been developed. PhD education is organised in graduate schools. All PhD students are attached to research groups and graduate schools, independent of their source of funding.

The faculty is also involved in lifelong learning, especially in relation to teacher education. It also offers special courses for high school students, and in this way works with future students and eases recruitment to the department.

Students who study to obtain teaching degrees and students who get a pure physics degree are taught together, which is mutually beneficial because future teachers are involved in research and researchers learn communication skills. The department also promotes research in teaching physics and is a part-
ner in a national graduate school that undertakes research in teaching natural sciences.

The department has good links with the labour market and also actively seeks input from the labour market in terms of the qualifications graduates are required to possess. The department is aware that the communication skills of graduates in terms of explaining in layman’s terms what it is that they do need to be further developed.

3. Delivery of education

There is a well-organised introductory course (*Flying Start*) which includes a system of tutoring by older students. During this course, the students are exposed to the full spectrum of research that the department offers. This motivates the students and stimulates their scientific curiosity. This is very much appreciated by the students.

Since the department is aware of the challenges of teaching physics and that the first semester is crucial for students to get an understanding of the discipline, which has the image of being very complicated, specific attention is paid to ensuring that the introductory lectures are well prepared and taught.

The department has an excellent infrastructure, including an open learning space for students that can be used at any time. The building infrastructure facilitates communication between students and teachers. The link between theory and practice is made clear in laboratory classes and students are included in research groups very early on in their studies, starting in the 2nd year. This involves students actively using and running highly complicated research facilities, including the nanoscience centre and the accelerator laboratory (under supervision). Students also build machinery and infrastructure for their own projects. The department also offers summer training programmes and schools, and students are hired to work in the laboratory facilities.

Even though the majority of the courses are taught in Finnish, courses in English are offered wherever necessary and virtually all physics textbooks are written in English, making it easy to integrate foreign students.

There are a number of innovative teaching methods besides traditional ones (e.g. PBL-oriented courses), and the same applies to assessment. The faculty aims to match learning outcomes, teaching and assessment. In addition to exams, students also receive constant feedback (formative assessment), especially in laboratory classes.

The department encourages the development of the teaching staff’s pedagogical skills, including taking full certificates in the faculty of education.
All students in the department have personal study plans. These are drawn up in cooperation with senior students and then sent to the teaching staff for comments. Students appreciate the use of personal study plans and find them very helpful in structuring their studies.

4. Outputs

The length of time taken to complete a degree has fallen in recent years and the department is very attentive to ensure that students finish their degrees on time. Furthermore, the number of dropouts has also fallen.

Feedback from the labour market and students/graduates is positive. Graduates enter the labour market with comparative ease and are employable in many different professional settings.

The department uses tracer studies with a high rate of return (90%) and has a systematic way of gathering feedback, although the way in which the information is used seems to be more informal. Furthermore, the department has a well-established network of alumni. Many teachers still have personal contacts with former students. One demonstration of this is the fact that alumni are also invited back as visiting lecturers.

5. Continual development

The unit is engaged in a constant development process. Feedback is used systematically to develop new courses, e.g. Researcher’s toolbox and Physicists in working life, and to reform the curriculum. Evaluations are carried out regularly and are appreciated by both students and staff. Research on teaching physics is also carried out.

The goal of increasing the percentage of female students is to be strongly encouraged, although the strategy on how to do this is still a bit vague. The panel also encourages the department’s idea to widen the scope of teaching in experimental physics at PhD level. This has already been addressed but will need further effort. The department is also planning to enhance and improve the communication skills of graduates, for example by increasing teaching in small groups and decreasing the number of traditional lectures.
2.7 University of Lapland, Department of Social Work

Proposal for a Centre of Excellence in University Education 2010–2012

1. Mission of the unit

The unit has a history spanning a quarter of a century. The subjects taught – the science of social work, rehabilitation science, leadership psychology, social gerontology and social policy – are sciences firmly anchored in practice. The strategic core of teaching embraces solid theoretical and methodological instruction, continuous reflection on theory and practice, and a link between the education offered and development-oriented research. The unit has smoothly functioning structures in place for cooperation with students, and electronic feedback systems provide each student with an opportunity to contribute to the work of the unit and the content of the teaching. The unit’s distinguishing features is its research and development focus on the boundaries between traditional academic disciplines and on wholly new areas. One example – a unique development in the Finnish academic world – is the introduction of the science of rehabilitation into the curriculum. The unit is working to develop an enhanced capacity to respond to societal changes and transitions. In pursuing this aim it develops not only teaching and research but also networking, internationalisation, specialisation and an innovative dialogue between teaching and research expertise. Characteristic of the unit’s work is sound and solid interaction with working life, social institutions, the Third Sector, and research institutions in Finland and abroad. Long-term curricular reform in response to local and global challenges has distinguished the unit’s work both nationally and internationally. The unit has succeeded in integrating its work in step with the overall development of the University such that it has contributed to the institution’s strategic aims and regional mission.

The unit has established a number of different specialisations within science of social work by defining the scope of the professorship in the field and by establishing a particular focus for the separately funded master’s degree programmes and the teaching (gerontological social work, development of IT applications for social work, and social economics and management of social welfare). In strengthening its core expertise in social work the unit has established a profile distinguished by empowering social work, social work in the field of marginalisation, child and youth social work, and rural social work. Attaching leadership psychology to the administrative sciences enables the basic sciences to take steps towards applications that are required in working life.
Teaching and research are extensively networked, with international, national and local contacts complementing and reinforcing one another. The unit’s most significant role nationally in university cooperation is coordinating the network university of social work, a responsibility which the unit has handled since its creation. The work of the six universities in the network comprises education leading to the basic degree, professional licentiate degrees (120 credits) in five areas of social work, virtual education (e.g. 17 online course accounting for a total of 74 credits), research collaboration and international activities. The network has provided added value by enhancing the unit’s capacities to address the challenges in the discipline in the areas of education, research, society and internationalisation. Local networking (which includes cooperation with developmental units, service providers, and administrative and planning authorities) supports teaching in concrete terms by providing opportunities for students to complete their field practice, lends relevance to research and development projects and enables the unit to better further the University’s societal mission. A particularly important site of cooperation regionally is the unit’s responsibility in coordinating the Centre of Expertise on Social Welfare (some 25 professionals): this has made it possible to offer teaching leading to the basic degree in social work in another province.

The unit has implemented education at both basic degree and postgraduate levels internationally through collaborative projects, research cooperation, international expert duties and brisk student and teacher exchanges. Its distinctive international orientation and well-established cooperation with Russia and the Baltic states are reflected in an academic chair featuring a specialisation in Russian competence. In addition, for ten years the unit has hosted an international summer school organised in cooperation with the University of Vermont, providing a forum bringing together almost one hundred students and teachers yearly from different parts of the world. Extensive international networking enriches teaching and research by introducing comparative, multicultural and global dimensions.

The unit’s financial resources comprise basic funding from the Ministry of Education, special appropriations from the Ministry and external funding. The special appropriations have enabled the unit to develop a number of educational innovations. External funding supports research, allows participation in development and makes it possible to respond to the special educational needs of the labour market. The resource use is based on continuous self-assessment, planning and development, the backbone of which is meetings at the unit level, the unit’s links to other faculties and the university at large, as well as staff development days. These forums have provided the ideas for the application for a centre of excellence in university education, and the application has been prepared by the entire staff of the unit in joint unit-level meetings and through exchanges of email. A five-member group was in charge of finalising the application (two pro-
fessors, an assistant and two students). The staff has also had an opportunity to comment on a draft version of the application.

2. Programme and course design

The programme of studies is planned and assessed two or three times a year at staff development days, once a month in unit-level and teaching staff meetings, and in meetings organised to address particular themes, attended by representatives of student organisations. This approach provides a basis for developing and refining the curriculum and for launching innovations where content and pedagogy are concerned. In order to ensure the close connection between teaching and practice, work on the curriculum draws on directions taken nationally in the development of the subjects taught and assessments by experts on future labour needs. The Centre of Expertise on Social Welfare and other local actors are also involved. The teaching staff has engaged in extensive and diverse self-development in pedagogical training, which enhances the planning and quality of the education offered. A dynamic and interesting interlinkage between research and teaching is created by introducing research results in the teaching, as the unit’s researchers teach and its teachers do research.

Curriculum design has included long-term cooperation with other units at the University as well as with other universities nationally and internationally. Among the benefits of the networking in curriculum planning are a module run jointly with other units in the faculty (25 credits Power and Empowerment, Knowledge, Researching the Human Being, Economy and Society and Northern Cultures and Politics); interdisciplinary studies (Legal Informatics, Developmental Psychology, Research in Gendered Violence, Women’s Studies, and Social Work Legislation); cooperation with the Department of Research Methodology and the university-wide Centre for Researcher Education; the national-level basic, professional licentiate and doctoral training in social work; course modules carried out as part of international cooperation; and the separately funded master’s programmes. Cooperation with open universities is extensive as well. Combining teaching for basic degree students, students in the open university and students in separately funded master’s programmes has produced synergy benefits and geographical breadth. In order to reinforce lifelong learning, the unit has invested effort in its Third Age University, which has the distinction of being the only one in the country to award a doctoral degree. Acute and unprecedented labour needs are dealt with at both the basic degree level and in the separate master’s programmes, where teaching draws particular attention to opportunities to earn new qualifications while working. For persons in working life, the unit offers an opportunity to specialise in social work through national postgraduate training, which helps meet the challenges of demanding expert duties.
Undergirding all of the education offered by the unit is the principle of interlinking theory, practice and research. For example, all phases of basic degree teaching in social work (basic, subject and advanced studies) include field practice. The bachelor’s level creates a firm foundation for theoretical, professional and research-based know-how. The unit views the bachelor’s level as general academic education; at master’s level, the theoretical, professional and research knowledge is deepened and students gain the skills they need for independent work in demanding human-oriented professions and societal responsibilities. Three routes to the postgraduate degrees are offered: national doctoral programmes, the professional licentiate degree in social work and the generally available doctoral and licentiate education.

3. Delivery of education

The choice of teaching methods takes into account the particular character of the subject being taught, the aims of module, teaching resources and the mix of students on the course, as well as any special circumstances of the students involved. The teaching makes use of a wide range of pedagogical approaches, such as co-operative learning, learning by experience, case-oriented, problem-based and participatory learning, and artistic expression. Peer learning is also a rewarding and fruitful approach, and is thus encouraged by teaching and completion of course work in small groups and by open online learning environments. Teaching draws on the two–teacher model, for exposure to and acquisition of a wide variety of approaches and critical thinking are considered crucial (e.g. research methods, combining theory and practice; and guiding the research process).

Basic, subject and advanced studies include a great deal of contact teaching in small groups. The strengths associated with this approach are enhanced interaction, reflectivity, the development of argumentation skills, a firm grasp of ethical issues and the development of analytical thinking. Lectures are used in courses providing an orientation or theoretical background to a subject when several groups of different students are taking part in the same course and when teaching professionals who are already active in working life. Lectures are organised on both a face-to-face basis and as distance learning using the relevant ICT.

Basic and postgraduate teaching also uses a great deal of online instruction. Students have laptop computers provided by the University. The online environment is used to distribute materials and to facilitate a dialogue between students, teachers and the unit’s collaborating partners. Online teaching is particularly suitable where the teaching is closely linked to working life or widely distributed geographically. One particularly beneficial approach has been to combine face-to-face and online modes of teaching. Experiences have also been very favourable regarding online help for students (e.g. the APUA [help] -service that makes immediate feedback possible), feedback on assignments and course assessment.
Student guidance in the unit is personal and systematic, keeping the student aware of the educational opportunities available and able to create a programme of studies that serve his/her aims and particular situation. The progress of these personal study programmes is regularly monitored throughout students degree work to strengthen the mutual commitment to it. Teacher-tutor work is an essential part of the guidance practices. Student guidance in rehabilitation science and in the master’s programmes has successfully been developed into portfolio work, providing opportunities for implementing a connection between practice, research, teaching and development in individual learning processes and promoting development of a professional identity.

In addition to traditional examinations and essays, assessment of course work includes oral and group examinations, discussions, posters, self-assessment, seminar papers and literature circles, independent analytical assignments in small groups, interviews of experts and what are known as knowledge markets. Using essays to test students’ knowledge of relevant literature is the preferred approach, as it is perceived as being particularly appropriate for the subjects taught in the unit. Modules in advanced studies and postgraduate studies can be completed by presenting papers or posters at international conferences or publishing articles.

Internationalisation is integrated into the structure of education in the unit. Students are encouraged to take part in international exchange, cooperative programmes organised in neighbouring regions and the annual international summer school, and the courses offered by visiting teachers. The unit has a number of international educational projects under way, of which some continue established links and others are new efforts. Long-term cooperation with universities in Russia has yielded a cross-border university programme leading to a master’s degree in social work. The programme, to begin in 2009, will provide unique opportunities for developing professional qualifications and excellent opportunities for Finnish students to familiarise themselves with the situations, challenges and prospects for development in global contexts. The most extensive cooperation at the unit in the area of international postgraduate study is focused on the transition countries, which are well represented; the largest group comprises 25 students from Lithuania.

At any given time, the unit has international postgraduate students working on a doctorate. An additional resource is the European doctoral programme in social work, a collaborative effort of thirteen universities. The programme provides a thorough grounding from a comparative perspective in the development of social work in different environments. To date, the focus of the programme has been neighbouring regions (St. Petersburg, Kaliningrad, Latvia, Estonia and Lithuania). Other programmes include comparative training in health and welfare, run as a cooperative effort of Arctic universities, and a European-Canadian programme related to field practise in social work.
4. Outputs

The large proportion of external funding is a sound indication of the diversity, the productivity and the extensive networking that characterise the work being done in the unit. Networking has made it possible to constantly expand the number of international partners and the scope of international activities (education, research, development and expert duties). The unit is a sought-after partner, yielding international activities producing cumulative opportunities for the personnel and students, as well as the capacity to take on international responsibilities, for example, an active role in the assessment and planning of education in neighbouring countries (Estonia and Lithuania).

The most recent statistics show that 96% of the students admitted succeed in completing their studies. A survey conducted by the University’s Career Services shows that 90% of graduates are in working life six months after graduation and 93% have responsibilities commensurate with their education. According to a survey conducted in spring 2008, graduates from the unit’s degree programs are proud of the education they have received. The professional licentiate in social work has earned a high status in the labour market and there is a clear social need for the know-how which the education offered produces. This is reflected in the employers’ commitment to the licentiate programme and in the favourable career development which those completing the degree have enjoyed. One outcome of international cooperation is that international students have completed – or will soon complete – doctorates, and in the future the unit will have international basic degree students as well. Continuous development and assessment of curricula and teaching methods have ensured that the education offered has clearly attained the aims set for it where content is concerned.

The unit has developed itself in a principled manner into a strong research and teaching facility and it has twice been awarded a status of a centre of excellence at teaching. Priority has been given to developing the quality of teaching based on research and innovative pedagogical approaches. The unit has a research programme of its own with its particular emphases and, among other things, it coordinates a national doctoral programme in the field. Doctoral programmes, joint university-wide methodological training, international research projects and multidisciplinary, cross-institutional and networked groups of researchers support the development of research activities and their linkage to the education provided. The unit has succeeded in combining research, teaching and the social mission of the University by seeing to it that most of the staff are familiar with all areas of responsibility. Everyone has his or her area of core expertise, and expanding these are supported systematically.

With reference to the quantitative indicators in the attached statistics, the following merits are highlighting. In the years covered, approximately half of the
The education provided by the unit is developed in cooperation with the students by assessing the quality of teaching, identifying problems and generating ideas for improvements. In the model used, known as the “quality bridge”, students, teachers, employers and alumni together assess the quality of teaching. The expertise of the personnel and their view of research, educations and future trends in working life constitute a significant resource in developing teaching. The personnel are strongly committed and motivated, with regard to not only research, teaching and development responsibilities but also pedagogical skills. Efforts to improve the capacity of the personnel to meet future challenges include organising research periods, activating personnel to engage in further education, and maintaining an atmosphere in the workplace that is conducive to development. Every member of the personnel submits a personal report of his or her activities annually, which enables individuals to update their CVs and teaching portfolios appropriately.

The unit is currently systematically pursuing developmental measures relating to the content of teaching, its connections to working life, the strengthening of research that supports the education provided, and the advantages to be gained from internationalisation. The most recent ground-breaking steps where international studies for the basic degree are concerned are the two master’s degree programmes being implemented in the Barents region. Where international postgraduate studies are concerned the focus is on ensuring the continuity of the long-term cooperation that unit has had with the Baltic countries. The international summer school is moving towards a more multidisciplinary format. Work begun at the end of 2007 continues on renewing the agreement-based links between education and working life regarding the content and structures of the programme. Research is being strengthened in a variety of ways: implementing a research programme within the unit, strengthening national researcher education, and extending international contacts. The content of the education is being revised with particular emphases: in psychology the focus is on leadership and co-
operation with administrative sciences, in rehabilitation on a multidisciplinary point of departure in the framework through which society is interpreted, and in social work on the areas of specialisation available to students and the areas in which the unit has established a strong profile (mentioned in the description of the unit’s mission). The starting points in revising programmes are improving quality, the correspondence between education and working life (a national project in social work is also beginning) and student participation.

Student feedback on the quality of the education provided by the unit is gathered in a range of contexts: personal guidance, the feedback system in online environments, assessment methods tailored to individual modules and the students involved in the unit’s curriculum development, surveys of working life carried out by Career Services and joint feedback sessions at faculty level. These feedback systems complement one another. Opportunities to give feedback online are comprehensive; the feedback is anonymous and can be read by everyone. One approach that has been adopted to address the increasing number of students and their diversity is to assess the scope and the benefits to be gained from the information collected using the present feedback systems. The unit has recently piloted a structured feedback questionnaire designed by students; this is to be developed into an annual barometer that will be combined with the joint feedback discussions of the students and personnel. This in turn will make it easier to respond to the many and often conflicting pressures which students, working life and societal changes place on the programmes offered.

Problems identified in teaching are addressed on the level of the individual, the group taught and the degree programme. In professional licentiate education and online environments it has been noted how important it is to document to students the feedback they have given and how the feedback is used to develop the education given. The opportunities for professors in the licentiate education to obtain information have been improved by constructing assessment pages from which the professors can get ideas and ready models for building up their own feedback systems. In the case of international partners, the education is developed on a project-by-project basis. A vital condition for developing all of the education in the unit is to keep the threshold for receiving, giving and make use of feedback low. Both within the faculty and the University, the unit has been a pioneer in educating its personnel to be quality oriented, in critical self-assessment, in modelling educational processes and in planning, piloting and adopting new solutions.
Supplementary statistical and background information

The university proposes (circle the appropriate item)  
1 Faculty  
2 Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

The data given below are based on the University’s own statistical system. The results recorded at other universities in the networks are not included.

### 1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students (basic intake (+exceptions))</td>
<td>82 (+39)</td>
<td>67 (+14)</td>
<td>78 (+3)</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>384</td>
<td>400</td>
<td>437</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>0</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>30</td>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>5</td>
<td>6.0</td>
<td>5.5</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit</td>
<td>9,929</td>
<td>13,423</td>
<td>10,725</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total (registered (all))</td>
<td>81 (116)</td>
<td>63 (117)</td>
<td>55 (121)</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor subject students (students from other units)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students, total</td>
<td>154</td>
<td>113</td>
<td>118</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>1710</td>
<td>1459</td>
<td>1396</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other education provided by the unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td>569</td>
<td>492</td>
<td>684</td>
</tr>
</tbody>
</table>

**Description of other education provided by the unit**

Basic and/or subject studies have been offered on an annual basis in the open university in the unit’s own and/or neighbouring regions (rehabilitation has been taught even farther away). The teaching in the network university is also given at five other universities.
2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>25,4</td>
<td>27,3</td>
<td>26,6</td>
</tr>
<tr>
<td>Professors</td>
<td>7,1</td>
<td>7,2</td>
<td>7,5</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>7,4</td>
<td>8,3</td>
<td>10,6</td>
</tr>
<tr>
<td>Other personnel</td>
<td>10,3</td>
<td>12,6</td>
<td>9,8</td>
</tr>
<tr>
<td>Docents/Adjunct professors</td>
<td>12</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents)</td>
<td>31h</td>
<td>42 h</td>
<td>48 h</td>
</tr>
</tbody>
</table>

3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students</td>
<td>1 (2)</td>
<td>1 (2)</td>
<td>1(1)</td>
</tr>
<tr>
<td>Foreign postgraduate students</td>
<td>24 (30)</td>
<td>17 (30)</td>
<td>15(32)</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td>3,2</td>
<td>3,2</td>
<td>1,8</td>
</tr>
</tbody>
</table>

4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>1034</td>
<td>1055</td>
<td>1128</td>
</tr>
<tr>
<td>External funding (1000 e)</td>
<td>759</td>
<td>952</td>
<td>1192</td>
</tr>
</tbody>
</table>

5. Graduate schools and educational networks

**Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years**

In 2005: 3 (c) + 4 (p); in 2006: 3 (c) + 6 (p); in 2007: 3 (c) + 8 (p)

Responsibility for coordination in all years for one local, one national and one international network. Partner mainly in multidisciplinary networks.

6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

Both Career Services and the unit monitor placement of graduates yearly. The qualifications attained through the education provided are developed in continuous interaction with stakeholders in working life, with agreements concluded for the purpose. The unit has taken part in studies carried out by the ministries and been in charge of research assessing the needs of working life and education.
Evaluation team’s feedback to the unit

1. Mission of the unit

The department has a clear mission, which is to educate social workers through constant interaction between teaching, application and research. At the same time, the department considers that its mission is to address and actively tackle issues relevant to Finnish society through a process of structured interaction. The work of the unit is based on excellent interaction with working life, social institutions, the third sector and research institutions. Research and teaching are closely interlinked. The unit is also well-embedded in the university.

The department has an international profile and is an active centre for international cooperation in its field. This is demonstrated, for example, through the strong cooperation with the Baltic States and Russia as well as the international summer school that is organised every year and which attracts students from all over the world. The department offers a joint master’s degree with a Russian institution and is currently exploring a possibility of extending this to PhD level.

The department fosters effective and close interaction between students, teachers and practitioners in the community of practice at various levels. The atmosphere between the teachers and students is very informal and “family-like”. This makes it easy to work constructively through discussions and feedback mechanisms for the entire duration of the studies.

2. Programme and course design

The curriculum design is excellent and has included long-term cooperation with other units in the university, other national and international universities and external non-academic partners. The planning process in general is very inclusive and involves several rounds of consensus building and feedback from students and the external labour market.

In the planning process, the demands of working life are actively examined and included in a constructive manner. External stakeholders value the openness of the university towards external input into its programmes. Furthermore, it was stressed that in the planning process, the department tries to take practical issues into consideration by including extensive practical training periods (five weeks for a bachelor’s degree, ten weeks for a master’s degree).
Students participate in research in the very first semester, usually in the form of small research projects that the students are assigned to and which are usually carried out in the field.

There is an impressive number of multidisciplinary modules in the programme and the department tries to include subjects from other disciplines in its programme. In some areas, e.g. rehabilitation, IT and social work, and social work in the Sami culture, the department is unique in the Finnish context as it is the only institution in Finland to offer those degrees. This is one of the reasons why the unit is successful in attracting students from various parts of Finland and also from Europe as exchange students.

Students have stated that their wishes are usually taken on board by the department and that it is fairly easy to propose new courses to the department. The department takes students’ wishes on board very quickly as far as possible with respect to the planning perspective and resources.

Teachers consider their role in many instances as being that of a facilitator for the students. Since social work is an applied discipline that involves human interaction, the teachers and students stressed the importance of dialogical interaction and reflection in the educational process. The level of trust between the teachers and students is very high.

3. Delivery of education

The department employs a large and innovative variety of teaching/learning methods, and the same is true of assessment methods. These are assigned to courses depending on the different objectives and learning outcomes of the course. The students are introduced to the learning outcomes in each course and are also made aware of the demands of the course.

In those courses that interlink theory with practical application, the unit employs a co-teaching model where a practitioner from the field teaches the course together with teaching staff from the university.

The department is strongly linked into professional practice in the field of social work. It works with various municipalities and organisations at the local, regional (Lapland/northern Finland) and national level. The work at regional level is of particular importance to the educational delivery. All students take a course on Lapland in the 2nd year and are given the opportunity to work in small groups with practitioners from Lapland dealing with various issues, such as service provision in sparsely populated areas, alcoholism, drug abuse, child abuse and social work in the Sami cultures.
The department offers a variety of e-courses and makes an online teaching platform widely available. It also offers degrees in lifelong learning for professionals via ODL. Since the department has a unique profile in Finland, online courses are taken by students all over the country.

Internationalisation has been integrated into the structure of the education. The department encourages students to go abroad, which quite a number of them do.

All students have a personal study plan, which is considered to be helpful. Tutoring on the study plans is carried out by the teachers via an online module. Discussions on the progression and/or necessary adjustments to the plan take place every year between the teachers and students. The same model is applied to PhD education. Since the department coordinates various national, European and international research networks in the field, PhD students are in close contact with professional networks of students working/conducting research in the same area in Finland and abroad. All PhD students participate in teaching.

Pedagogic training is regularly available to all teachers and many participate in courses on a voluntary basis.

4. Outputs

The department has an unusually high completion rate (more than 93%) and students complete their degrees in a comparatively short period of time. Employment is good and it is usually easy for students to get into the labour market; some students are recruited during their studies.

Feedback from alumni and other external stakeholders is excellent and strongly supportive of the work of the department. Many consider it to be a unit that manages to balance the demands of scientific education with the demands of professional practice in an excellent way. The department is the only unit in Finnish higher education that actively works with municipalities and communities in northern Finland and addresses various issues relevant to Finnish society, such as Sami culture, Russian immigration, and the implications of an aging population for rehabilitation.

At the international level, the department acts as a motor of innovation and development in its field within both education and research, for example by supporting the development of the field of social work in Russia and the Baltic countries since the early 1990s.
5. Continual development

The department has a good feedback and quality assurance system. Strategies on the future development of the system are frequently discussed. Curriculum development is forward looking and proactive and concerns fields of education that will be of increasing relevance in the future. The department has been active in participating in various pilot development projects. In general terms, there is a very clear vision of how to develop teaching and research.

Furthermore, there is a strong focus on research and networking, as well as on developing the educational programme. Finding ways to improve the balance between research and professional practice in the various specialisations continues to be one of the major priority areas for the future development of the department.

In order to raise the unit’s international profile, the unit hopes to offer an increasing number of courses in English in the future.

Lastly, the unit hopes to be able to increase the recruitment of male students into a discipline that is traditionally viewed as being “female dominated”.
2.8 University of Oulu, Department of Educational Sciences and Teacher Education

Proposal for a Centre of Excellence in University Education 2010–2012

1. Mission of the unit

Our department is a community of active members. Therefore, it was natural for both staff and students to create a report together. During this process, there have been joint discussion meetings for all staff members and students. The teaching development teams (TDT) have also gathered feedback on teaching, and they have presented their proposals and ideas on the content of the report. Thus, the entire staff had an opportunity to do critical reading of draft versions by e-mail. There was also an evaluation session with the TDT’s, as well as staff interviews. The head of the department has finalized the text together with her colleagues.

Our department, the Department of Educational Sciences and Teacher Education is a multidisciplinary research and training unit in the field of education and teaching, with some 100 teachers and researchers, 78 university training school teachers, and 40 other staff members. The annual combined student intake for the degree programmes is 248 students. The total amount of students is some 1700 students. Our department was reorganised in 2000 to form one solid unit to better serve students in degree programmes of Educational Sciences, Primary School Teacher Education, Music Education and Early Childhood Education. For students of our department as well as from other departments we offer minor studies for example in sociology, women’s studies, and psychology. We also provide pedagogical studies for subject teachers of all subjects. Consequently, our department focuses on multidisciplinary interaction and co-operation. Students from different programmes are placed together during certain courses in order to enrich educational dialogue and to effectively use the expertise of teachers in all our programmes. Our department has employed high level professionals who hold a degree in pedagogical studies. Our department has received several awards at the national level, such as the ‘Centre of Excellence’ award. At the local university level, we have achieved awards for e.g. ‘excellent team work’ and ‘excellent teaching.’

The mission of our department is to train students to become experts in the field of education and teaching, both at the scientific and practical level. The changes in learning and educational environments as well as in society in general – due to globalisation and new developments in technology – have brought about new challenges for teaching and education. We have responded to
these changes by doing research on these transformations, by applying our re-
search results in practice in teaching our students based on our research, and by
refining our teaching methods in line with the most recent research on collabo-
orative learning and the application of net-based learning environments. The com-
mon ground for all our training programmes is crystallised in the following pil-
lars of education: Scientific Grounds and Practical Acquaintance, Active
Citizenship, Ethical and Aesthetic Sensitivity and Thinking and Opera-
tional Skills in Didactics and Pedagogy. Below, we have provided examples
of how these principles have been applied in practice.

Our department has had a pioneering and pace-setting role in tackling the
above-mentioned challenges by establishing programmes that focus on these chal-
lenges. In order to address the new dimensions of multiculturalism in Finland,
for more than 15 years, the department has been offering a Master of Educa-
tion, International Programme, in which particularly multicultural, ethical
and global issues in education are addressed. The programme has been enriched
by about 20 international visiting lecturers and about 40 exchange students an-
ually as well as professionals from, e.g. the OECD, the World Bank, and various
NGOs. In addition, our students study abroad as part of their compulsory stud-
ies. In 2006, a two-year Master’s Degree Programme ‘Education and Glo-
balisation’ started in which there are currently students from ca. 25 countries.
The programme allows students the possibility to take a double degree with a
university of another country. The programme has enabled a dialogue between
the North and the South, the East and the West. Through its international pro-
grammes, the department has been a pioneer in student and teacher exchange
with developing countries.

In terms of a future information society, our department is doing its job at
the core of learning. Actually, we were the first in the country to offer a 25 cred-
it course in ICT in 1993. Currently, the Educational Technology Research
Unit (EdTech) offers courses in ICT which are based on topical research on
learning, and the latest knowledge on technology and international collabora-
tion. A two-year Master’s programme ‘EduTool’ was organised in 2005–2007
and it is now aiming to establish a permanent status as a Master’s programme.
EdTech offers multidisciplinary collaboration in research and training for the ped-
agogical use of technology, and is contributing to the development of a virtual
university in the university and in the country.

For more than 10 years, the department has been the only teacher training
unit to educate technologically focused teachers. The programme focuses on
sciences and the handicrafts industry, especially on technical work and the cur-
rricular theme called “Man and Technology”. The aim is also to increase the in-
terest of girls in technology in basic education, and to offer ‘learning by doing’,
which serves the interest of boys in general. Technology Education cooperates
with the Faculty of Science and the Faculty of Technology.
For the programmes above, the role of natural sciences, social sciences and language studies is essential in human development. In order to focus on the role of aesthetic sensitivity, the **Arts and Crafts Oriented Programme** was launched in 2007. The curriculum links arts and crafts in an innovative manner with each other and to other school subjects. This programme responds to the weakened status of arts and crafts in basic education and teacher education. The cultural and teaching strategy of the programme, which is strongly supported by and in synchrony with the wishes of the local administration, was a major impact in launching the programme.

The same four pillars have also been applied in our **PhD programme**. Our aim has been to develop a new type of research tradition in response to the problems experienced in Northern Finland, and the globalising world. Our department has started a systematic improvement of the PhD programme, which started with active participation in founding the Finnish Graduate School in Education. Our department coordinated the KASVA graduate school for a period of 4 years. Professors have become active participants and net workers with their PhD students in the research community nationally (e.g. graduate schools) and internationally (e.g. KALEIDOSCOPE) as well as locally (e.g. Future School Research project).

**In conclusion**, our staff members and students have systematically developed our educational programmes bearing in mind the needs of the present as well as those of the future. The actions and attitudes of both staff and students reflect a dedication to learning, teaching, and the well-being of children and youth – a dedication that is based not only on professional and scientific knowledge but also on heartfelt commitment and a sense of calling.

### 2. Programme and course design

Developing the curricula collaboratively is a tradition in our department. It has been a cyclic process of action research, involving testing, evaluating, and reformulating. The entire staff took part in the Bologna Process, including members of the administration. Our process began with a core analysis of the curriculum. Feedback and experiences related by students played a major role in this phase. The content of the curriculum was reformed thoroughly in all the degree programmes instead of merely converting the old credit units into ECTS credits. Our process involved monthly meetings with all stakeholders and all degree programmes. In these meetings, the work of small groups – which were formed according to expertise and research interests – was commented on critically. We also invited external experts to come and offer their views on challenges in the educational sector. Our curriculum is partly competence-based and connects the components of research, theory and practice. The requirement for the successive and cumulative nature of studies between theory and practice was especially fo-
cused on when planning teaching practices. The outcomes of the curriculum reform are subjected to constant re-evaluation. A concrete example of the students’ initiative concerning curriculum development is that, quite recently, one of our student unions made an initiative for the evaluation of the curriculum during the academic year 2008–2009.

Action research is not only present in forming the curricula. The view of teacher as researcher has been our vision since the 1980s. Therefore, qualitative research methods have played a significant role in Master’s theses, which allows future teachers to conduct action research as well as other kinds of practitioner research in classrooms and day care centres. The university’s Teacher Training School offers an excellent place not only for teaching practices but also for participating in research activities. For example, at present, several research groups are carrying out studies on motivation, self-monitored learning, children’s argumentation skills, and mathematical thinking. Many of the teachers have written their PhD theses on such developmental projects, the latest of which was published in 2007.

However, the idea of ‘teacher as researcher’ is not only connected to writing theses; it is also present in the early stages of the students’ studies through inquiry-based learning. For example, students reflect on scientific articles during teaching practices. They observe and are part of the research studies by collecting and analysing data at different stages of their studies. Students have the opportunity to get involved in national and international research group activities (see Appendix).

The relationship between special programmes (e.g. EdTech, International M.Ed) and teaching and research is strong. While some programmes have developed from the findings of our research groups, other programmes have led to the development of new research groups. One of the special areas of research and teaching derives from EdTech and the research they do on learning sciences and the use of educational technology (ET) in teaching and learning. An important aim of EdTech is to study and develop technology enhanced pedagogical models which support the mechanisms of deep learning. About twice annually, all PhD students in the EdTech team will participate in brainstorming and evaluation sessions of the ET studies. The curriculum will be jointly reviewed, and the content of the studies as well as literature will be updated according to recent ideas developed in research. The EdTech team has earned an award from its input of excellent research and work for our department and the University.

The International M.Ed. programme is an example of how the programme has led to the research group Ethics of Education. This group conducts research on intercultural and international education locally, nationally and internationally. Students have even carried out Masters’ level research on the programmes. Based on the results, changes have been made to the programmes. The
latest curriculum development, the Arts and Crafts Oriented Programme, was a result of intensive and effective teamwork inside the department and with experts in arts as well with schools in the city. Our university awarded the team for its co-operative effort and excellent work.

To us, Life long learning means a reciprocal relation with practitioners. We meet the educational experts at their workplaces and they also participate in in-service training offered by our department. The narrative research group, Living Story, has developed a narrative method based on peer counselling, to improve the ability of teachers to cope at work at all levels of education. This group has published a book on their experiences that can be used as instructional material. In the near future, the group will be involved in peer tutoring in the induction phase of a teaching career. The experience and research will in turn be used in improving pre-service training. The Future School Research (FSR) project integrates various degree programmes and research groups with developing teaching in city schools. We aim to change the culture of learning and teaching through innovative pedagogical practices, and by involving the entire community of teachers, parents, researchers and other stakeholders with the help of modern technology. The first seminar was organised in May 2008, which brought together ca. 150 researchers and teachers to present ongoing developmental projects as well as to plan future projects. FSR will be presented at the Shanghai World Expo in 2010.

The social influence exerted by the department has been persistent in the development of e.g. Open University teaching. The action model for flexible teaching in the KAJO project will also be utilised in other branches of science at the university. The project also correlates well with the region’s environmental structure in adult education. The action model will be implemented at a high quality level and in an up-to-date manner by making sensible use of the opportunities offered by technology.

3. Delivery of education

The goal of our department is to enhance the conceptual understanding of students so that their learn in a deeper and more effective way. Prospective educators need versatile skills and knowledge about problems in learning, multicultural issues, early learning, the use of technology, problem solving, working collaboratively and generating new ideas and new knowledge. Hence, our teaching must be based on latest research. We publish our research not only for researchers but also for students as well as for anyone else in the field. Our teaching methods are broadly based on the curriculum and the subjects taught. We use methods we expect our students to use in practice after they graduate.

For example, the Music Education programme approaches music education from a pragmatic perspective. A problem-based approach is taken in courses on
the didactics of mathematics and on physics and chemistry, involving experimental learning. ET studies emphasise independence, shared knowledge construction, and interdisciplinary viewpoints. Our teaching methods include contact and distance learning (including web-based environments), small group learning and individual work, expert seminars, lectures, discussion and dialogue, workshops, and excursions, which are beneficial for reflection and change of perspective.

Our department has various exam practices and assessment methods according to the purpose of the assessment. Instead of being used as a means to control or monitor learning, assessment has taken the role of promoting sociocultural learning, inquiry-based learning, and transformative learning. This leads to group exams, collaboratively made posters and exhibitions, seminar presentations, ‘learning circle’ discussions, and even artistic productions, e.g. concerts. Self-assessment takes place in oral and written form through reflective discussions, learning journals, reports, and portfolios. In addition, most of the PhD students give a lecture about their specific research topics, and organise international conferences and graduate summer/winter schools. These diverse practices result in providing students with knowledge from a variety of perspectives, offer different experiences, and scaffold opportunities for transformative learning.

4. Outputs

Our department is highly appreciated by the applicants. We therefore have the privilege of being able to recruit only the most suitable applicants out of a wide talent pool. Only ca. 10% of the applicants on average in the teacher education programmes (and only ca. 3% in one of them) are accepted. We monitor the results of the department’s activities in terms of targets set for the number of degrees and learning outcomes. The efficacy of education is monitored annually based on a follow-up study among the graduates and continuous feedback obtained from working life. The output of degrees at our department is excellent. In 2007, for example, our department was the only department at the university that reached set targets in terms of the number of degree graduates. The average time for students to complete their degrees has, during recent years, been 4.74 years but it decreased to an average of 4.66 years in 2007. The department has improved in achieving the goal of an absolute number of degree graduates. The quota of MA degrees for the department is 150 degrees. In 2006 it produced 166 MA degrees (111%). By 18 June 2008, our department has already produced 95% of its annual quota of MA degrees, i.e. 150 degrees.

Our department has developed a system that supports students. Each group of 20 students has, in addition to the student advisor, both a teacher tutor and a student tutor during the first year of their studies. Students will have a personal study plan made during the first six months of their studies. This includes the content and schedule of the studies, which are both updated at least twice dur-
ing the five-year degree programme. If students have problems in advancing in their studies, we provide extra support. Exchange students often find the academic culture different from that of their own, and need support. Our department has employed a person to take care of the exchange students’ and their study planning. This person was recently awarded by the university due to the excellent service she provides.

**Feedback given by exchange students** confirms that the department’s methods of action and teaching support learning, active involvement and interaction: “…through my experience in Finland, I know that another way of teaching is possible. Another way in which teachers know and treat students very well. Another way in which learning is an active process and students are main protagonists. Another way in which students really enrich their personality and way of thinking. Another way in which you really learn a lot by supporting your own motivation.” International guest lecturers have assessed the teaching and learning culture at the department thus: “I have never come across a more dedicated faculty body and more hard working and enthusiastic student group.” The above is also confirmed by the recent Master’s theses assessing the Bachelor’s and Master’s programmes. A study is currently under way that aims to assess how strenuous indeed the studies are. The department is making regular use of Master’s theses in evaluating and developing the quality of teaching.

**The learning results achieved by the students are excellent.** For instance, Master’s theses written in 2004–2007 have resulted in 40 theses graded “eximia cum laude approbatur” and three as “laudatur”, for which the university and the Finnish Educational Research Association have granted the department an award of quality. The department continuously receives positive feedback on its students from the practice schools. The students are described as showing great initiative, and being interested and deeply involved in their duties. **The feedback from working life** is also positive. This is supported by a career and labour market follow-up study made in 2007 that studied the employment situation of university graduates in 2002. The education is well in line with the needs of working life. 75% of those graduated in 2002 reported that they make constant use of what they learned during their studies. The students were almost equally satisfied with the quality and content of the studies, with averages of 4.4/4.5 on a scale from 1 to 6 (with 6 meaning “highly satisfied”). According to the graduates, the education provided the necessary skills needed in modern working life, e.g. information search skills, being able to combine different perspectives, perceive entities, and work under pressure. 80.2% of the graduates had found employment, 18.3% were on family leave or studying full-time while only 1.5% were between jobs. Among the Masters of Education who had studied in the early child education or teacher education programmes, none were unem-
ployed. The students find jobs well both in Finland and in international organisations such as UNESCO, UNICEF, as well as in NGOs.

To summarise, the department’s education is both productive and effective, according to the instruments and evaluation data at hand.

5. Continual development

The continual development of education and enhancement of activities is based on interaction between students and staff. In addition, our department is actively interacting with its alumni, with other providers of education, and other actors in this area (such as the State Provincial Office). A lively international student and teacher exchange programme also provides valuable information concerning the needs to develop activities.

Ensuring the quality of teaching is based on systematic self-assessment organised by TDTs. Each program had its own TDT with 4–5 students. The role of the student organisations and the TDTs is important for the assurance of the quality of teaching, as they collect assessment data from the students and teachers each year. The feedback is put together and analysed in joint assessment workshops. In connection with the assessment meetings, there are also meetings for alumni, where former graduates from the department are invited to report on issues in working life. Based on the assessment data and discussions in the assessment afternoons, the issues in need of development during the next year are chosen and a self-assessment report is drawn up. The feedback meeting is organised, and the report is composed by the TDTs within each degree programme. TDTs work independently and assemble regularly during the academic year. The identification and solving of problems is also promoted by the Ethical Committee and the Equality Committee, and the department’s activities are also developed based on the issues discussed by them.

In addition to the development of the quality of teaching within each programme, the Head of the Department and the Chief Academic Officer regularly meet the representatives of the student organisations of each degree programme. This helps in making sure that administrative decision-making interfaces in real time with the developmental challenges considered important by the students and staff. This practice also makes it possible to plan decisions on supportive measures designed to promote teaching and learning together with the students, discussing the best practices and procedures. During the past academic year, e.g. transition regulations have been constructed for the change in the degree structure, the procedures for collecting assessment data in the feedback afternoons have been standardised, good practices have been shared, relationships have been forged with representatives of the student organisations. Thus we have learned to understand the meaning of the different programmes as parts of the department’s activities. The department pioneered in Finland in deciding
to award an optional credit to a student for active involvement in the development of teaching.

In addition to internal assessment, the department has been involved in developing a regional model for educational assessment together with the representatives of three sub-regions. The department participated in the project launched in 2003–2004 together with the Provincial State Office and the university’s Research and Learning Services to evaluate the state of education and competence, the future challenges and the views of the educational professionals in the municipalities on the educational challenges and future perspectives of education in their own areas and municipalities. This project has provided more information on the competence challenges and educational needs in the area.

The quality of students at our department is excellent, and they are thus also very challenging. Due to their capacity and dedication in academic studies the students are very critical about the instruction and are active in many ways, e.g. in forming study groups and in developing the curriculum. Whenever our staff members feel either satisfied or tired, it is the students who keep us going!

Supplementary statistical and background information

The university proposes (circle the appropriate item)  

1. Faculty  

2. Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

Some of the information has been recorded on Faculty level both in our university and in the KOTA database as indicated for the relevant entry.

The department is part of a faculty with two accountable units.

The department’s volume is 2/3 of the faculty’s entire volume and it produces almost all of minor subject education in the faculty.

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>185</td>
<td>195</td>
<td>217</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>1267</td>
<td>1280</td>
<td>1371</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>16</td>
<td>17</td>
<td>34</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>139</td>
<td>119</td>
<td>166</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>4,74</td>
<td>4,74</td>
<td>4,66</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit*</td>
<td>86 707,34</td>
<td>86 297,86</td>
<td>95 524,16</td>
</tr>
</tbody>
</table>

*=faculty level, total credits produced by our degree students in our faculty and in other faculties of our university, and approximately 70% was produced by our unit
## Postgraduate students

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>175</td>
<td>168</td>
<td>138</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>7</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

## Minor subject students (students from other units)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students, total *not available in university’s statistics, estimation</td>
<td>250</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Credits completed by minor subject students*</td>
<td>12570,24</td>
<td>11322,17</td>
<td>13758,00</td>
</tr>
</tbody>
</table>

* = faculty level, total credits (our unit and the other unit), approximately about 99% was produced by our unit

## Other education provided by the unit

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td>300</td>
<td>1680</td>
<td>2400</td>
</tr>
<tr>
<td>Separately produced pedagogical studies (60 credits)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Description of other education provided by the unit

2. **Structure of teaching, research and other personnel**

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professors (unit level statistics)</td>
<td>14</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Other teaching staff (unit level statistics)</td>
<td>70</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Other personnel (unit level statistics)</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Docents/Adjunct professors (unit level statistics)</td>
<td>31</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents) (unit level)</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

3. **Internationalisation**

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students *the year 2007 was not available in KOTA</td>
<td>11</td>
<td>26</td>
<td>45</td>
</tr>
<tr>
<td>Foreign postgraduate students *see above</td>
<td>5</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Foreign personnel (the unit uses several visiting lecturers)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = including KOTA figures and also the amount of the students of the 2-year master’s degree programme since 2006

4. **Funding**

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>5876</td>
<td>5761</td>
<td>5766</td>
</tr>
<tr>
<td>External funding (1000 e)</td>
<td>1480</td>
<td>1573</td>
<td>1500</td>
</tr>
</tbody>
</table>
5. Graduate schools and educational networks in 2006 and 2007

**Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years**

**Graduate schools (national and international level)**
- The Finnish Graduate School in Education and Learning (FiGSEL)
- Graduate School for Interdisciplinary Research on Learning Environments
- DEVESTU Post-Graduate School in Development Studies
- Norforsk Graduate School in Women’s and Gender Studies

**Teacher and research (international level)**
- c Nordplus Networks
- c North-South-South Programme: University of Cape Town, University of Namibia, University of Zambia, Windhoek College of Education, University of Dar es Salaam

**Networks (international level)**
- c HeroDot-eNews, European Environmental News
- p FISTE-A future way for in Service Teacher Training across Europe
- p Comparative education network
- p European Teacher Education Network (ETEN)
- p Networks of Excellence Kaleidoscope
- p The Youth in Barents - Work and Welfare
- p ATHENA Advanced Thematic Network in Activities in Women’s Studies
- p Global Responsibility -project, Ministry of Foreign Affairs
- p ADEA Association for Development of Education in Africa
- p UNESCO Associated School Network

**Networks (national level)**
- p ETMU-Ethnic relationship and international immigration
- p UniPId (Finnish Universities Partnership for International Development)
- p KaSuKat: Management of Growth and Decline and the Quality of the Living Environment (The Case of Mining Communities in Northern Finland)
- p Hilma – the University Network for Women’s Studies in Finland
- p Finnish Youth Research Society
- p Early Childhood Education Network with Northern Finland Centre of Excellence
- p Social Welfare

6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

Based on the annual report by the university’s Career Services, the Department is monitoring the students’ placement in employment and satisfaction with their education. Additionally, every programme organises an event for alumni in connection with the annual feedback day, inviting graduates of previous years to report on their experiences in working life and on needs to develop the education.
Evaluation team’s feedback to the unit

1. Mission of the unit

The department has a very clear mission statement. It appears to be a very active unit which engages in several educational programmes and has solid pedagogical knowledge. The department has a very important role in the educational sciences and teacher education, supplying the northern regions of Finland in particular with highly qualified graduates.

There are strong links between research and teaching, and the training programmes are strongly related to the department’s mission. The department is very active as a coordinator and partner in national and international graduate schools and networks, and has a high level of external funding.

2. Programme and course design

The department shows a very positive attitude towards teaching, e.g. by taking the Bologna Process as an opportunity to reform its educational programme and not merely converting old units into ECTS credits. The department also brought in external expertise in carrying out this work. The way the unit has been able to combine research on learning and teaching with curriculum development is excellent, and its international programmes make it attractive to international exchange and degree students.

The unit cooperates very closely with schools and local authorities in developing its programmes and other activities as well as research. The curriculum links education, research and practice and is constantly re-evaluated, which is a very good practice. The department also has a clear lifelong learning strategy and offers training for people in the labour market.

3. Delivery of education

The department uses a variety of teaching and assessment methods, and these are interlinked in a very good way. The department has what may be termed a clear “learner-centred approach”, in which students are actively engaged. Student feedback is actively and quite promptly acted upon, e.g. in questions relating to assessment. In listening to students and acting in a very productive way on their feedback, the department comes across as being a very flexible, adaptive and student-oriented unit able to produce very good outputs in terms of highly qualified and attractive graduates.
4. Outputs

The unit’s quantitative outputs are very impressive. This is undoubtedly related to the good combination between the very active and good learning environment on the one hand, and high-calibre students on the other.

The fact that the unit has developed a teaching and learning environment that promotes student activity and good learning results has been confirmed by several sources, e.g. by feedback from working life. The department has produced over twenty doctorates over the past three years and has concrete plans to improve its post-graduate education. The way the department acts as one in its thinking about teaching and education, as well as its active engagement in teaching and the welfare and quality of its students, is very impressive.

5. Continual development

The quality of work at the department is excellent. It has a very clear vision of its development needs and plays a very active role as a leader and partner in national and international cooperation. It has a good quality assurance system that collects and manages feedback relating to its educational programme. The unit also interacts closely with external stakeholders.
2.9 University of Oulu, Department of Process and Environmental Engineering

Proposal for a Centre of Excellence in University Education 2010–2012

1. Mission of the Unit

The application from the DPEE was put together by a four-member Development Group (DG) nominated by the Teaching Development Team (TDT), which is a collaborative working party of department staff and students. The TDT works as an open forum, and every member of the DPEE can attend its monthly meetings. All development work documented in this application takes place under the supervision of the TDT. The DG was responsible for the application writing project, but students and staff members were extensively used as critical readers, interviewees, evaluators and providers of ideas. For an unbiased view, some of the readers were not members of the DPEE. An internal, two-hour evaluation session was also arranged with the boards of our student guilds. The means by which the application was compiled reflects our attitude to development: openness, professionalism and agility.

The DPEE offers degrees in process and environmental engineering at the bachelor’s and master’s levels (868 students, three year average) and at the doctorate level (160 students). The DPEE has a total of 180 staff: 9 professors; 27 other teaching staff; 62 other personnel and research personnel, the number of whom varies usually at around 80.

Educational Mission. Our education mission is to provide high-quality education for our students. This education is based on creative engineering science research, and specifically based on unit processes, a unit operations approach and a control of phenomena concept adopted widely in process, automation and environmental engineering. Science-based education in the DPEE has two dimensions: the integration of new scientific results into our curricula, and the assimilation of new pedagogical methodologies and concepts of teaching into our educational system. Improvements in both facets of education, substance and methodology, are built upon our own research. Committed to excellence in education, research, and societal impact, the DPEE seeks to prepare its students and graduates to lead meaningful and productive lives. Our mission is not only an educational mission, but a balanced mission: the pillars of education, research, and societal impact support one another. We make strategic educational choices, taking a process approach in educational development work, and using continuous assessment in all our education and in the dialogue between stakeholders. Our
development resources comprise both highly trained, motivated teachers and our students, who actively participate in our development efforts and projects.

**Our Educational Values.** The DPEE stresses the following values in its educational practice and development work: creativity, productivity and responsibility. **Creativity** involves our willingness to adopt new approaches and solutions, freedom in action and thought, risk taking, creative team work, constructive criticism and a willingness to take the lead in educational issues. **Productivity** entails enduring productivity, which means that our actions and our solutions to our educational problems have long-lasting effects. By productivity, we also mean commitment to the implementation of a quality assurance system and a continuous improvement process. We are also committed to reaching our aims in the number of degrees awarded. **Responsibility** implies trustworthiness and moral obligation in education (community, society, individual), in research and in societal impact. Our responsibility also entails credibility in ethical questions and in environmental issues.

**Our Definition of Quality in Education.** The DPEE is almost fifty years old and has long and tested traditions in engineering education. The DPEE has also a fifteen year history of quality work in education (1993–2008). The definition of our quality is based on our educational mission, on our values and on our educational culture, while keeping our scientific background continuously in focus. We constantly redefine our own quality in education and we strive to guarantee the outcomes. **Quality for us** entails a systemic and systematic approach to development, the participation of stakeholders, continuous improvement of educational processes and the ability to fulfil our mission. Since the DPEE is involved in education and in research in industrial (and natural) processes, it is only natural to take a process view in educational development and quality work. The main development tools are the mapping, analysis and critical examination of educational processes.

2. Programme and Course Design

**A Unique Fusion of Chemical, Environmental and Control Engineering.** The DPEE offers education in two basic study programmes: **process engineering**, specifically in chemical engineering, control engineering, process metallurgy and industrial engineering; and **environmental engineering**, specifically in water resources engineering, industrial environmental engineering and bioprocess engineering. The unifying element in all is a phenomena-based approach with a focus on unit operations and unit processes; we advocate a Competence Based Curriculum with individual strands (for example, thermodynamics in the engineering strand). Both study programmes exploit the same thinking, originating from chemical engineering and supplemented by modelling and control
functions based on the traditions of control engineering. Our education aims to help students understand phenomena and their control in industrial and natural processes.

**DAS-formalism at the Bachelor’s Level.** The DPEE has applied a new concept in process and environmental engineering education, consisting of descriptive, analytical and synthetic phases (a.k.a. DAS-formalism), and through which education in all orientations is carried out. In contrast to the conventional approach where engineering education starts with studies of natural science subjects, the formalism approach concentrates on **engineering from the first day on.** The descriptive phase focuses on outlining the engineering field through description; the educational field is covered conceptually and the mathematical arsenal, even though central in engineering, is not introduced until the second, analytical phase. During the analytical phase, the educational goal is to learn to use tools and different functional approaches to solve technical and scientific problems, that is, to control phenomena. The main task in engineering is the design and creation of functional artefacts, and this is what distinguishes the engineering sciences. Engineering here refers to the practice of organising the design, construction and operation of any artifice which transforms the physical world to meet some recognised need. Many scientific fields remain in the analytical phase, but an engineer must create an entity from elements. Therefore, the third phase, synthesis, focuses on acquiring design skills. DAS-formalism has been successfully applied since 2005, and the results are encouraging: according to research results, we have the most motivated and satisfied students in the engineering faculty and we have found indications of better learning results. DAS-formalism (as well as the phenomenon-based design approach) is unique on an international scale, and both elements are considered a very useful research-oriented guiding principle for education.

**Quadrangular-Model at the Master’s Level.** Our generalist three-year B.Sc. education continues with two-year master’s programmes, which are based on the Quadrangular-Model (QM). The QM consists of four modules (each one 30 credits) that could be combined to form customised professional and scientific profiles. Students select one of the fundamental modules and complete it with a continuation module or another (parallel) fundamental module. The fundamental and continuation modules are developed and constructed by the department. The third module can be individually constructed by the student, and the fourth comprises the master’s thesis. The QM offers several advantages: 1) module-based study guidance is essentially more efficient than course-based guidance; 2) a two-year specialisation after a generalist period enables both department and individual students to react quickly to changes (an example being the newly constructed Mining Engineering module); 3) individually constructed modules promote an interdisciplinary approach, while other modules ensure the accumulation of relevant engineering skills and knowledge, that is, enhance the student’s own pro-
fessional profile; 4) 30-credit modules (fundamental and continuation) match su-
perbly the study exchange programmes (30 credits per academic term and 60
credits per year).

**Collaborative Master’s Thesis.** Most students complete their diploma or
master’s thesis project in close collaboration with industry, where they address a
relevant engineering problem. This practice is very much appreciated, since it
contributes to the students’ development of application-oriented research skills
and gives them early exposure to technological problem solving in an industrial
environment; it also promotes project and team work skills. Since they work in
industry from three to four months every summer, our students become familiar
with the industrial environment during their studies; we see this activity as a part
of our education and societal impact.

**Next Stop: Bologna ‘Third Cycle’.** The creation of an internationally
competitive graduate school within the DPEE requires considerable efforts from
us in the coming years. We are happy with the number of doctors graduating
but, according to an outside assessment; the scientific level must be raised. A TDT
for Doctoral Students has been active for five years, and the results are very
promising; the interaction and creation of networks between doctoral students
and research groups has increased considerably.

### 3. Delivery of Education

In addition to sound curricula, the best recipe for an excellent delivery of edu-
cation is motivated students and dedicated, highly motivated personnel. The
DPEE has especially stressed the pedagogical training of its teachers. The pro-
portion of teachers with pedagogical training rose from 57% in 2002 to 74% in
2005 and continues to rise. Many of our teachers have completed a formal teach-
er education of 60 ECTS, and many are currently participating in such an edu-
cation. The DPEE also educates its own teaching personnel in the areas of tutor-
ing, teaching methods and curriculum work.

**Students into the Centre.** A multitude of teaching methods are employed
in the DPEE. This is due to the fact that the majority of senior staff are not com-
fortable with new teaching methods, while a minority of the senior and most of
the junior staff are very well educated in university pedagogy. The latter are there-
fore more prepared and more confident in using and developing new teaching
methods using ideas from, for example, Collaborative Learning. Since the middle
of the 1990’s, a major shift has taken place from teacher-centred (‘instructor talks;
students listen’) to student-centred (‘students interact with instructor(s) and one anoth-
er’) teaching methods. There are also teacher teams who readily distribute their
know-how in teaching matters. Our student-centred approach can also be seen
in the extensive, well resourced tutoring system for B.Sc. students, which has been
implemented since autumn 2005. Each tutor, who is also a DPEE teacher, has 8–
10 students to be tutored. Tutoring has created much closer ties between stu-
dents and teachers, study problems are dealt with at very early stages, retention is better and students are more satisfied; tutoring also helps the creation of Study Groups. According to the Teaching Development Unit of our university, our tutoring is among the best in our university. In addition, students also participate in the creation of new teaching materials, especially in the area of process metallurgy.

From Terminal Assessment to Continuous Assessment. The DPEE is also in a transition concerning methods of learning assessment. The DPEE has traditionally followed standard engineering education practices and has used terminal assessment (TA) as its sole assessment method. In the middle of the 1990’s, new assessment methods (lecture diaries, portfolios) started to emerge. These new methods were not imported into the DPEE ‘as is’; instead, they were first tested in an engineering education context and only then implemented. The ongoing change in the DPEE is a move from TA to Continuous Assessment (CA). In the DPEE’s eight different laboratories, the introduction of CA varies. On average, 44% of courses at the B.Sc. and M.Sc. stages use CA. CA provides several advantages in engineering education. Firstly, CA makes it easier to match assessment methods with learning outcomes; encourages regular, systematic study; and provides an on-going picture of how individual students develop and mature. In addition, CA constitutes a useful vehicle for on-going course monitoring and evaluation, that is, it can be used as a base for quality monitoring. CA also reduces both student and teacher stress by removing study peaks, and also provides a more natural assessment environment that is better matched to the situations in which students will find themselves working in later life, a very useful property in the life of a future engineer. These outcomes are generally cited in the research literature, and it is worth noting that the DPEE has also observed these phenomena in its own development and testing work. Continuous assessment really works!

Necessary Actions. As a department, the DPEE does not invest in making teaching and assessment methods and methods of studying mutually supportive, at least on an explicit level. This will most likely be one of the future tasks in departmental development work. At an implicit level, it is expected that the best possible combination is chosen, which invariably happens when continuous assessment is properly applied. Present activities range from lectures and terminal assessment to rigorously applied continuous assessment, where teaching methods, assessment methods and work methods blend into one another. Currently, the DPEE is also focusing on the selection of teaching methods. The method of teaching must not only be based on the skills of the teacher and on the substance being taught. Teaching methods must also be chosen systematically according to the positioning of a course in a certain phase of DAS-formalism or in the QM, that is, the time continuum of the curriculum must also be taken into account. This requires further education and practice for our dedicated teachers.
4. Outputs

**Quality Monitoring System.** The monitoring system of our education process is based on three different views: curricula, courses and individual students. The primary quantitative characteristics (indicators), such as throughput of courses and accumulation of a student’s credits, are frequently examined. These predict quantitative output but may also indicate a structural problem in the curricula or in a particular course. The throughput of a particular course indicates not only the quality status of the course, but also the level of knowledge of students entering the course: a problem observed in a particular course may be due to a quality defect created in earlier course(s). One such typical problem emerges when a student does not really grasp the essentials of differential equations (DE) and, consequently, problems arise in a modelling course which uses DE’s as a tool. The quality defect thus created surfaces in the modelling course, but the true culprit is elsewhere. In order to make the monitoring task easier, only some ‘marker’ courses are scrutinised in the chain of courses.

**Balancing Qualitative and Quantitative Aspects.** The balance between qualitative and quantitative outputs is based on our quality philosophy: we concentrate on educational processes and we keep on eye on both qualitative and quantitative outputs. Typical **quantitative outputs** monitored are course, yearly intake, and total yields and throughputs. In particular, we concentrate on deviations, since these are usually a source of a major cost. **Qualitative outputs** monitored are written student feedback, monthly meetings with student representatives and yearly meetings with all students. Professional competence is constantly checked in discussions with potential employers. Soft indicators are also used, such as a tutor’s discussions with his/her students during the creation of personal study plans, and lecturers’ notifications on level of knowledge during the teaching.

**Seamless Employment.** The balance between the qualitative and quantitative outputs is indicated well by the number and marketability of our graduates. We have excellent records for quantitative outputs in accordance with the planned number of degrees, 85 M.Sc.’s and 7 D.Sc.’s per annum: during 2005–2007 the average was 82.3 M.Sc. degrees and 7.7 D.Sc. degrees. The year 2008 will be a record year for the number of M.Sc. degrees. At the same time, our alumni have virtually full employment and are constantly recruited by international companies.

**Continuous Process Improvement.** Our quality philosophy has also resulted in a properly executed curriculum renewal process (see Section 2), in which, based on analysis of educational processes, the deep curriculum structures are reorganised to make our educational principles more transparent to our students (Competence Based Curriculum). The students who were accepted after the curriculum renewal have graduated with a bachelor’s degree and are moving on to their master’s. The ultimate effect of the renewal on our educational cycle...
will be evident in the future. However, it can already be seen that the renewal was not only cosmetic, but actually added value: student-teacher and teacher-teacher networks have emerged, and professional identity has been enhanced among students and, most surprisingly, among teachers.

Provalka from Autumn 2006. The DPEE has a ‘Get Your Degree Finished’ programme for students whose studies have been delayed, mostly due to the fact that they are already in working life. Extensive support and special arrangements are made available. The results of this programme are unique: in 2006, four students and, in 2007, twelve students gained their M.Sc. degree through Provalka.

Student Exchange (3–12 months) took place as follows: in 2007, there were 24 incoming students mainly from Germany, Spain and France, and 10 outgoing students from the DPEE. These numbers used to be even, but recently our attraction has increased, since the combination of chemical, environmental and control engineering offers a unique study opportunity for foreign students, especially at the M.Sc. stage. The present foreign degree students are listed in an appendix, and in autumn 2008 there will be 4 new foreign degree students. The DPEE also employs its own international coordinator, who is responsible for honing and streamlining our processes in this area and also provides foreign students with tailor-made study plans. Although our teaching language is Finnish, we can also provide our courses in English for foreign students.

Internationalisation. The DPEE has ties in education with universities in Scandinavia and the European Union. The most recent development is the creation of a cross-border network university with universities in northern Scandinavia and in north-western Russia to establish several joint master’s programs leading to double degrees. In this effort, the DPEE will provide expertise in the area of environmental engineering education. We are also converting M.Sc. modules in environmental engineering for English-medium instruction.

5. Continual Development

Identity. Strong efforts in development work are partly due to a need to profile the DPEE, both internally and externally. In a multidisciplinary university, as opposed to a single-disciplinary technical university, an engineering unit is constantly in contact with different scientific disciplines and needs to strengthen, sharpen and redefine its educational approach. Results from our development and research work in the area of engineering education are documented in over 100 publications, most of which are available on our websites. Our teachers are not only teachers and researchers in their own engineering disciplines, but many of them are also researchers in engineering education. The DPEE has also been affected by worldwide problems in recruiting new students into engineering schools, and the unit needs to formulate a clear educational ‘mission’ and create a ‘brand’ to market: in short, it requires an identity.
History. The DPEE has had a long history in developing its education. The coordinating element is our TDT, which started functioning in the middle of the 1990’s and has never stopped functioning. The DPEE has twice received the national award for ‘Centre of Excellence in University Education’. The DPEE has also experienced three stages in its development work. The first stage (from 1993 to 2002), ‘a technical stage’, concentrated on building up a quality assurance system, documenting our educational system and developing effective teaching methods for our own purposes. During this time, we learned that we need a flexible, adaptive quality assurance system. The developers constituted a tiny fraction of our teachers. The second stage (from 2002 to 2005), ‘an engineering-science-based stage’, concentrated on the intense effort of curriculum renewal work and on further developing our quality assurance system. The number of teachers involved increased considerably. This stage also introduced ‘process thinking’ into our quality work. The last stage (started 2005), ‘a holistic stage’, has led to a systematic and systemic view of our development efforts: we cannot simply develop our activities in education in isolation, but must concentrate on our research and on our societal impact at the same time.

Holism and Pragmatism. Our development work has progressed from isolated efforts to a holistic approach. This work is driven by our own needs, not only by the pressure from outside stakeholders. The development work is also pragmatic, with theoretical approaches, such as DAS-formalism, being tested before introduction into our system. In accordance with John Dewey, we take the view that experimentation (social, cultural, technological and philosophical) can be used as a relatively hard-and-fast arbiter of truth, even in educational systems. A current challenging task involves yet another paradigm shift, the complete integration of three different scientific disciplines, chemical engineering (ChE), control engineering (CoE) and environmental engineering (EE) in our curricula. At the B.Sc. stage, ChE and CoE currently use the same curriculum, while EE shares 75% of the curriculum with ChE and CoE.

Processes. The DPEE has taken a process view of its education. During the curriculum renewal, the whole educational process, including our D.Sc. process, was modelled and analysed by the TDT using Core Analysis Tool as one of the tools. Several critical points were identified (some of them previously unknown), and these critical points (for example, student intake, status after one year, student retention, problematic courses) are constantly monitored. Strategic discussion groups (staff, weekly), the TDT (staff & students, monthly), and yearly student meetings (staff & students) create an open dialogue culture, which is a part of our self-correcting quality assurance system and naturally identifies critical points. This culture was not created overnight and has required considerable time and efforts. The most severe problem identified immediately above entails the recruitment of new students, and marketing measures are being pursued.
approach, the process view, requires that development work is not situated in the ‘comfort zone’, but that challenging tasks are relentlessly pursued.

**Development Projects.** The DPEE is moving away from the sporadic and isolated efforts of the 1990’s to more concentrated development projects. Even though the DPEE has a staff of nearly 200, resources are not to be wasted; we concentrate on a few development projects instead of spreading our resources too thinly. Two types of development projects are currently undertaken in the DPEE: content-based development projects, that is, ‘What is being taught?’, and pedagogically based projects, ‘How is the substance taught?’ and ‘Why is this substance taught?’. Societal impact, a part of our educational process, also generates new projects. However, it is vital to choose those projects that add most value. We aim to initiate development projects without delay: the sooner the problems are addressed, the better the outcome. **The main development project** at this very moment concerns the creation of a recruiting process which assures the acquisition of the best students, a very problematic issue in engineering education in Finland. Development efforts are also required for our alumni activities.

The DPEE was recently assessed by outside experts, who stated in their assessment report: ‘The department excels in undergraduate education (BSc and MSc degrees) not only because of dedicated and highly motivated personnel but also because of the implementation of a quality assurance and continuous improvement process.’

### Supplementary statistical and background information

*The university proposes (circle the appropriate item)*

1. Faculty
2. Department

**FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.**

*In case of lacking information, please indicate why it cannot be provided.*

---

1. **Student structure in the unit**

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>154</td>
<td>91</td>
<td>84</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>981</td>
<td>875</td>
<td>747</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>79</td>
<td>85</td>
<td>83</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>5.84</td>
<td>5.41* (6,14)</td>
<td>4.81* (7,04)</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit</td>
<td>29310</td>
<td>29883</td>
<td>27390</td>
</tr>
</tbody>
</table>

*without PROVALKA students (PROVALKA is a special campaign for students in working life)*
### Postgraduate students

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>161</td>
<td>170</td>
<td>150</td>
</tr>
<tr>
<td>Licentiates awarded</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Doctorates awarded</td>
<td>4</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>

### Minor subject students (students from other units)

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students, total</td>
<td>335</td>
<td>321</td>
<td>305</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>2449</td>
<td>2357</td>
<td>2238</td>
</tr>
</tbody>
</table>

### Other education provided by the unit

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td>218,5</td>
<td>178,5</td>
<td>203</td>
</tr>
</tbody>
</table>

Credits done by students who have temporary right to study

**Description of other education provided by the unit**

### 2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>121,7</td>
<td>115,2</td>
<td>111,5</td>
</tr>
<tr>
<td>Professors</td>
<td>9,5</td>
<td>8,9</td>
<td>8,5</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>27,2</td>
<td>27,7</td>
<td>25,2</td>
</tr>
<tr>
<td>Other personnel</td>
<td>65,6</td>
<td>60,6</td>
<td>59,1</td>
</tr>
<tr>
<td>Docents/Adjunct professors</td>
<td>26</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Amount of teaching given by adjunct professors (docents)</td>
<td>less than 100 hours</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students</td>
<td>7</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Foreign postgraduate students</td>
<td>8</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td>25</td>
<td>26</td>
<td>19</td>
</tr>
</tbody>
</table>

### 4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 e)</td>
<td>4981</td>
<td>5018</td>
<td>4691</td>
</tr>
<tr>
<td>External funding (1000 e)</td>
<td>3798</td>
<td>3716</td>
<td>4715</td>
</tr>
</tbody>
</table>
Evaluation team’s feedback to the unit

1. Mission of the unit

The mission of the department is specified and clearly formulated. The unit shows that it has a very clear and well-founded educational philosophy. There is a long history of interest in teaching and student learning. Although the unit has undergone changes, the new staff have been able to maintain a genuine learning culture.

The department demonstrates that teaching and research are very closely interlinked e.g. in the way students are expected to cooperate with industry during their studies. This is also visible in the considerable level of external funding.

2. Programme and course design

At the bachelor’s level, the formalisation of descriptive, analytical and synthetic phases, which forms the basis to the course design as well as the training being carried out, clearly shows, together with the Quadrangular Model at the master’s level, that the unit follows up on its mission statement.

There is excellent interlinking between research and teaching in the curriculum and course design. The curriculum aims at competence-based and
phenomena-oriented learning and has a clear pedagogical concept in a process-oriented way. At the master’s level, there is a special pedagogical model which allows for specialisation and individual choice. Theses are written on industry-oriented projects, exposing the students to real-life problems.

A collaborative working party of department staff and students, the Teaching Development Team (TDT), seems to work extremely well. It works as an open forum, and every member of the department can attend its monthly meetings.

The unit has taken measures to monitor its own development and to identify problems and challenges, for example, by using the TDT to perform core content analyses. The proposed development projects will no doubt give the unit important information that it can use to further develop its educational programme and its teaching/learning environment. The department is clearly interested in improving its teaching and learning environment for doctoral education. The TDT for doctoral students has been active for five years, and the interaction and creation of networks between doctoral students and research groups has increased.

Students at all levels actively participate in developing the teaching by giving feedback in both formal and informal settings as well as through different discussion forums.

The department cooperates with industry in different ways. For example, staff representatives are often asked to give courses/act as consultants on various occasions. At the same time, it is obvious that there is room for improvement, as contact between the department and industry is typically on a “one-to-one” basis. A more systematic form of cooperation and engagement in lifelong learning could be developed, for example between the department and POHTO – The Institute for Management and Technological Training.

3. Delivery of education

The switch from predominantly teacher-centred teaching methods towards more student-centred methods and continuous assessment instead of terminal exams is considered to be very positive. Furthermore, the unit’s analysis of its own challenges in working towards making assessment methods and study methods mutually supportive ensures the attainment of defined learning outcomes.

The department is large, but the individual approach to students is remarkable; a good example of this is the “Get Your Degree Finished” programme for students whose studies have been delayed. A large proportion of teaching staff have undertaken pedagogical training of 60 ECTS. The depart-
tion uses a good variety of teaching methods and the teaching staff not only show that they are concerned about their students, but also that they have a solid understanding of their own teaching and the way teaching and assessment need to be aligned.

Students are very satisfied with the learning environment and with the teacher-student relationship, which is characterised as being friendly and helpful.

4. Outputs

The department has created a good system to ensure qualitative outputs, and that measures are taken when necessary. The unit has developed a detailed quality monitoring system that is actively used on the basis of the feedback. Furthermore, the quantitative outputs are good. The employment of graduates is 100% and many graduates are recruited by international companies. Much of this success may be due to the flexible and adaptive learning culture, which, according to the students and external stakeholders, is typical of the department.

5. Continual development

The department has a very strong and strategically balanced vision that focuses on developing processes and projects with universities in Scandinavia and the EU. At the same time, the department acknowledges that it faces challenges as far as the recruitment of students – both Finnish and international – is concerned. This is a concern it shares with the external stakeholders and current students; the department may need to put more effort in marketing the strength of its educational programmes and high quality teaching and research.
2.10 University of Turku, Faculty of Medicine

Proposal for a Centre of Excellence in University Education 2010–2012

1. Mission of the unit

The main mission of the Undergraduate Education Programme in Medicine is to educate professionally competent physicians for the needs of the public health care system. The Faculty has recognised that biomedical and clinical knowledge, based largely on natural sciences, is of central importance in medical practice, but that, in addition, medical students should conceptualise health as a multifactorial entity having cultural, psychological and social dimensions. Consideration of these aspects in undergraduate medical education is also emphasised by profound structural changes and increased demands in the functional environment of the health care services. In response to these challenges, the Faculty has reformed its teaching and learning philosophy, restructured the curriculum and initiated pedagogic research projects to guide changes in undergraduate medical education.

According to the new education philosophy, the purpose of the Medical Faculty is to educate experts of medicine, who are knowledgeable and responsible physicians for clinical work as well as for biomedical and clinical research and administration. It is suggested that the future physician has integrated competence and holistic view of patient treatment, in which scientific thinking, knowledge of behavioural science and ethics are integrated with clinical knowledge. As a part of its renewed teaching culture, the Faculty recognises the central role of students in the planning and development of curriculum, and is therefore strongly committed to student-centred education. A further basic cornerstone in the curriculum design and support of learning and teaching in the Faculty is the relevance of the degree in working life. In order to support the above-mentioned activities and to allocate the resources optimally, a Centre for Medical Education Research and Development (R&D) was founded for the need of Faculty in 2002.

The Faculty has a unique profile among the Finnish Medical Faculties, since it hosts several Master’s programmes (Dentistry, Medicine, Nursing Science and Health Bioscience) allowing productive multidisciplinary collaboration within the Faculty. This can be considered as a special strength for the Medical Undergraduate Programme in terms of joint resources and fruitful learning environment for the students. This application was prepared jointly by a group representing the administration of the Faculty (Vice Dean), Centre for Medical Education Research and Development (Professor and Head of the Unit) and representatives of teachers and medical students.
2. Programme and course design

Based on the recommendation put forward by the international evaluation of the Undergraduate Medical Education Programme in 1996 and on the critical self-evaluation of the Programme carried out in 1999, reformation of the undergraduate curriculum in one-cycle Master's programme in Medicine was performed under the guidance of the Faculty during the years 2001–2008. The reformation aimed to stress the significance of evidence-based medicine and scientific thinking, and to improve the students' perception of the competencies reached during their education as well as the importance of cultural and psychosocial factors for health and diseases. At the same time, students' understanding on the rapid growth of medical knowledge and the essential need for continuous and life-long learning were emphasised. In this process, the Faculty has launched horizontal and vertical integration of biomedical and clinical knowledge into multidisciplinary study modules, included humanistic and psychosocial sciences as well as medical ethics into the curriculum, desentralised teaching, initiated pedagogic education of the teachers, and personal tutoring of the students. Special attention in the reformation was expected to be paid to the balance between medical knowledge and requirements of the working life. The Faculty nominated representatives of teachers, students and physicians from public health services to the planning groups of the modules. This underlines the responsibility and coordinating role of the Faculty for the curriculum. On the other hand, this arrangement emphasises the commitment of the whole faculty, specifically that of the students and teachers, to continuous critical development of the curriculum. A new, open-minded approach to improved understanding and respect for multiprofessional attitudes in undergraduate medical education was the initiation of graduate entry studies for other health care professionals in the Programme. This unique 4-year try-out in medical education in Finland has offered new tools for the development of medical education and acknowledgement of previous health care expertise in medical undergraduate training.

The planning of the study modules is based on the idea of continuous accumulation of medical knowledge, skills and attitudes, as well as professional identity. A pioneering programme of Early Patient Contact during the first year of studies, organised by the Department of Family Medicine together with the local health care centres, introduces the students to the clinical work, doctor-patient relationship and goals of the medical education in a multiprofessional environment. Since this programme partly runs in health care centres with a significant number of patients being of various ethnic backgrounds, aspects of multicultural communication are encouraged. Early integration of clinically relevant information into the theoretical studies as well as practical training of communication further provide foundation for competencies of a physician and strengthen the cumulative nature of the professional growth of the students. Increased amount of clinical training in local health care centres and municipal hospitals allows the students
to identify the functional roles of a physician as well as the interactions on different levels of the health care services. During the clinical training periods in teaching health care centres, special emphasis is paid on the responsibility of the students for their learning, patient contacts and communication within the multiprofessional environment. To further stress the importance of preventive medicine for the students, *student-based longitudinal health surveys* (health risk analysis, health counseling and follow-up) of their own family members are included in the curriculum. All these activities in the curriculum are assisted by the personal tutoring programme. The final year of the studies has been totally restructured in order to give broad overviews on diagnosis, treatments, prevention and rehabilitation of common diseases in the society.

The Faculty has put special emphasis on *elective courses by offering the largest selection and volume* (up to 50 ECTS from total 360 ECTS of the Degree Programme) of them among the Finnish medical faculties. The special value of elective studies is recognised to promote multidimensionality. They strengthen the integration of research and teaching, as well as induce the utilization of the knowledge and teaching resources of all researchers in the Faculty. Elective study modules are also seen as flexible tools for the development of innovative core study modules, and for the promotion of joint courses of various faculties within the University. Purposeful development of the elective study modules is partly restructured into special elective study tracks, such as Cardiovascular Track, Neuroscience Track and Nutritional Science Track. This allows the students to deepen and integrate special medical knowledge in the field and personalised their studies according to their interests.

A central coordinating role in the planning process has been dedicated to the *Medical Education R&D Centre*. The Centre is headed by a professor, and the Vice Dean, Senior Education Officer, Coordinators of Clinical and Dental Studies and Education Officers of the Faculty are taking part in the activity of its directing board. The Centre also has an *Advisory Committee*, which brings the interest groups of medical education, e.g. professional experts as well as representatives of education, health care services and other faculties of the University, together to review and anticipate the future needs of the educational function of the Faculty.

**Doors open to science, culture and society**

The Medical Faculty has recognised that, in addition to biomedical and clinical knowledge, multicultural and social aspects are of importance in medical practice. Consequently, courses dealing with human beings as part of the social network (e.g. family, relatives, society) have been integrated into the curriculum. The new curriculum thus incorporates courses like human growth and life cycle, ageing, confrontation of disease and death, as well as courses on impact of culture
on human health behaviour and illnesses. The core curriculum also contains studies on ethics, philosophy and medical history. Accordingly, the Faculty has appointed as the only medical faculty in Finland a professor in Medical Ethics.

The Medical Humanities Programme in the Faculty, Asklepios Programme (15 ECTS), has been organised together with the Faculties of Humanities and Social Sciences since 2002. The programme forms an important part of the curriculum in the conceptualisation of health as a multifactorial and multicultural entity. The elective programme provides a unique opportunity for students of medicine, humanities and social sciences to explore together the concepts and cultural dimensions of health and illness from a multidisciplinary scientific perspective. An introduction course and four special study modules over a 1-year period are offered to survey relevant scientific issues of medicine and humanities. The students also prepare an interdisciplinary research project. In 2006, Asklepios Programme was awarded the title of Educational Course of the Year in the University.

The renewal of Swedish Language Education in the Faculty is another innovative approach to teaching. In addition to mere language teaching, aspects of culture and history of the Swedish-speaking citizens (6% of population) living mostly in the archipelago and coastal areas have been included into the core curriculum as a new intergrated course called “Medicine and Culture in the Archipelago”. The course is developed in co-operation with the Language Centre of the University and offers the students opportunities for home visits and communication in Swedish language in the archipelago. The course was also designed as an introduction into living conditions, health and culture of elderly people representing the Swedish speaking minority in Finland. The course was selected as an Educational Course of the Year in 2007 in the University. In a similar fashion, a new innovative course on physical exercise and health (including nutrition) is organised in co-operation with the Sports Institute of Finland located in Vierumäki in the vicinity of the city of Heinola. The Faculty recognises the importance of exercise, nutrition and preventive medicine, and has therefore appointed a professor of Health Exercise. Another course that is called “Doctor and Civil Defence”, is planned and organised together with the Finnish Defence Forces in the Centre for Military Medicine in the city of Lahti. These abovementioned unique approaches are seen as outstanding additions in the medical undergraduate education, since they open outside the traditional health care environment important new views on human health, exercise, nutrition and culture.

Medical education aims to educate physicians, who are capable of scientific thinking and linking theoretical scientific medical knowledge to practical skills. The Faculty has recognised the important link of research and education, and has organised special research tracks for the undergraduate medical students. Currently, the Undergraduate Education Programme in Medicine contains two research tracks: an early-starting biomedical and a later clinical track, with a vol-
ume of 30 ECTS. Research tracks are closely connected with teaching and training activity of the Postgraduate School (PGS) of the Faculty. The aims of the tracks are to guide the students through various research methods, laboratory practises, biostatistics, research ethics as well as training of communication and performing skills. The research tracks help the students to integrate into the research community of the University and further serve as flexible routes into Graduate Schools of Biomedical Sciences and Clinical Sciences of the Faculty.

3. Delivery of education

Based on careful planning carried out by study committees, diverse and pioneering teaching and assessment methods are utilised throughout the curriculum. Improved training of doctor-patient contact, communication and other clinical skills has been made possible through increased decentralisation of the clinical education, the establishment of a Clinical Skills Centre (e.g. Simman, phantoms), and extensive organisation of clinical training periods in hospital wards and outpatient clinics as well as in health care centres. A special innovative approach is the two-week “Minihospital” (ie. a third of one hospital ward) period during the 6th year, where the students actively take care of all aspects of patient examination, planning of diagnostic tests and treatments under close supervision of a full-time senior teacher. Web-based learning environments and teaching technologies, as well as a comprehensive personal tutorial system of the students further promote students’ academic and professional growth. Frequent feedback from recently graduated physicians and their employers is an important part of the quality control of the Education Programme.

New learning environments

The role of learning environment in supporting the development of medical expertise is essential. The Faculty has recognised that the university hospital, with its highly selected patient material, is often not an optimal learning environment for teaching diseases and problems commonly seen in public health care services. Consequently, the Faculty has decentralised a substantial part of the clinical teaching outside the university hospital, to several health care centres and municipal hospitals. Two teaching health care centres designed specifically for medical education purposes have been established in the area, both of which have adopted a multiprofessional education policy. The network based on decentralisation of undergraduate education offers excellent possibilities for training the future doctors to understand the function of different levels of health care system. Furthermore, the relevance of undergraduate education for working life has thereby significantly improved.

The Faculty has decisively developed electronic learning environments and teaching technologies. The Medica-portal of the Faculty, serving as an electronic
base for various teaching and learning materials for students and teachers, has been operative since 2002. The portal allows organisation of web-based national and international medical courses. In the near future, Medica-portal will promote the use of electronic portfolios of the students, utilised in the tutorial programme. Other developmental steps in web-based teaching are the MedImage-portal offering hundreds of patient cases with clinical and radiological data, and a video network between the University and decentralised health care centres allowing joint lectures and conferences. For these activities the Faculty has provided special resources (a professorship for development of medical teaching technology, a coordinator of electronic network teaching and a teaching technologist).

Assessment

This curriculum based on cumulative knowledge is followed by systematic feedback from students and teachers. Electronic feedback is collected by the teachers responsible for the courses and semesters, and then analysed and taken up for general discussion in special feedback seminars. All the teachers, students and their tutors take part in these seminars. In addition, in cooperation with the Faculty of Education, the Medical Education R&D Centre has designed a unique feedback form usable for all courses and semesters. Students’ opinions on the course objectives, teaching and learning as well as their own activity are collected in a unified form and analysed. A summary of the results comparing different courses is finally presented to the Board of Education of the Faculty, and also made visible in the Medica-portal to serve the planning of the forthcoming courses and semesters. Through systematic review of the feedback results, the Medical Education R&D Centre is able to assess the influence of the feedback on the curriculum design.

Towards academic professionalism

Today’s physicians work as experts of medicine in multidisciplinary teams. The education strategy of the Faculty recognises the need of support for the students to grow and ultimately work as physicians. Based on the recommendation of an international evaluation of Medical Undergraduate Education at our University, the Medical Faculty decided to establish a programme of personal tutoring for all undergraduate students in 2003.

A tutorial group consists of 8–10 students. Regular group and individual meetings of the tutors and their students are organised through the 6-year medical curriculum. The tutors have a pastoral role in facilitating the students to learn, checking their personal study plans and portfolios, identifying personal problems as well as supporting the development of the professional identity of a medical doctor. To foster students’ development, a structured self-assessment for reflection on their personal, academic and professional performance has been connected to students’ portfolio work for several years. The Faculty has presently over 60 trained
tutors who participate in further development of the tutoring system. In the feedback surveys, the tutors perceived the programme to be highly supportive for the students’ academic and professional development. The supportive value of the programme was also recognised by the students. This programme of personal tutoring in Medical Undergraduate Education is pioneering in Finland, and it needs careful follow-up to prove its ultimate influence on educational outcome.

In addition to tutoring by faculty members, senior medical undergraduate students are also trained as peer tutors. Their role is to provide social support to 1st years students and aid them in learning the practicalities of studying medicine in the Faculty. Their work is, according to the yearly assessments, considered essential by the student body in integrating new students into the faculty community. The social support provided by the peer-tutoring activities is seen by the Faculty as a vital part in supporting the welfare of medical students and maintaining a student-friendly learning atmosphere.

The improvement of pedagogical abilities of the teachers is vital for the continuing development of the teaching and learning culture of the Faculty. The Medical Education R&D Centre of the Faculty has organised pedagogic courses (10 ECTS) for medical teachers since 2003. So far, over 100 teachers have taken part. During the course, they have prepared their own pedagogical development project continuously reflecting in curriculum design; teachers and students are also encouraged to actively participate in national and international conferences of medical education.

4. Outputs

In order to educate physicians with integrated clinical knowledge, holistic view of patient treatment, scientific thinking and knowledge of behavioural sciences and ethics, the main objectives of the Faculty in the delivery of the Undergraduate Education Programme in Medicine are: strengthening of the teaching and learning culture of the Medical Faculty; promotion of pedagogical education of the teaching staff; longitudinal support of the students; and fostering of the commitment of our students to the academic community and to lifelong learning. The qualitative output of the Programme is followed by frequent and longitudinal analysis of students’ study orientations, progress and professional development. This gives useful general knowledge about the quality and efficiency of the Degree Programme. Although the high student group-size poses a key challenge for the development of medical education, a vast majority of the medical students graduate successfully. Post-graduation feedback surveys have so far proved the Degree Programme to be well designed for the needs of working life.

Assessment of student learning is in central focus of educational development in the Faculty. In addition to traditional examinations, other assessment methods, including learning and lecture diaries, are increasingly used in the Faculty.
assessment of clinical skills is also taken into special consideration, and several clinical courses have introduced OSCE (Objective Structured Clinical Examination) – examinations that will be also in the focus of the future curriculum development. The feedback on learning as well as individual academic and professional development of the students, based on their self-reflections, is of special and unique significance and is the central tasks of the tutors. Assessment of learning as an important focus in the Undergraduate Education Programme of the Faculty is additionally supported by a joint research project on cumulative learning and investigation of longitudinal development of expertise during medical studies (LeMEx Project), conducted by the Medical Education R&D Centre. Several research reports on learning, both oral and posters, have been presented in national and international educational conferences.

5. Continual development

Explosive growth of the medical knowledge and technology together with increasing demands of the society on the medical profession place continual challenges to medical education. The Faculty sees that participation of students and newly graduated colleagues is imminent in creating new educational visions and adequate timely revisions of the Programme. The importance to complement these approaches by detailed feedback surveys from employers, medical associations and especially from patients and patient organisations is also recognised. To further support the educational reformation the Faculty has also initiated benchmarking projects on curriculum development with other medical faculties in Finland and abroad.

Rapid development of web-based learning environments and electronic databases strongly challenges traditional views of learning requirements. Optimal utilisation of electronic learning tools is therefore of utmost importance in future medical education and in professional working life. The Faculty recognises, however, that this requires a strong basic knowledge and understanding of medical science as well as ability of scientific thinking among the students. Therefore, knowledge of accumulative learning and medical thinking of the students, and the balance between optimal learning environments are needed. Ultimately, however, the Faculty aims that the graduates of the Programme are aware of the importance of empathetic and supportive attitude towards patients and their family members and have a holistic view of health, illness and society.
Supplementary statistical and background information

The university proposes (circle the appropriate item)  
1 Faculty  
2 Department

FINHEEC requests you to provide the statistical and background information on the unit you propose on this form. Please give the data in the form they are in the KOTA database. If the itemisation on this form does not correspond to the activities of the unit, please answer as appropriate.

In case of lacking information, please indicate why it cannot be provided.

1. Student structure in the unit

<table>
<thead>
<tr>
<th>Students</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitted new students</td>
<td>185</td>
<td>183</td>
<td>146</td>
</tr>
<tr>
<td>Registered students, total</td>
<td>1092</td>
<td>1190</td>
<td>1198</td>
</tr>
<tr>
<td>Lower (BA) degrees awarded</td>
<td>0</td>
<td>31</td>
<td>26</td>
</tr>
<tr>
<td>Higher (MA) degrees awarded</td>
<td>129</td>
<td>131</td>
<td>162</td>
</tr>
<tr>
<td>Median duration of study in years (BA + MA)</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Credits completed by degree students in the unit</td>
<td>68776</td>
<td>68295</td>
<td>64214</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Postgraduate students</th>
<th>2005</th>
<th>2006</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Registered students, total</td>
<td>956</td>
<td>941</td>
<td>930</td>
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<tr>
<td>Licentiates awarded</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Doctorates awarded</td>
<td>66</td>
<td>55</td>
<td>49</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor subject students (students from other units)</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
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<tr>
<td>Students, total</td>
<td>2129</td>
<td>1907</td>
<td>2216</td>
</tr>
<tr>
<td>Credits completed by minor subject students</td>
<td>24687</td>
<td>17879</td>
<td>13070</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Other education provided by the unit</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credits other than above completed in the unit</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Description of other education provided by the unit

2. Structure of teaching, research and other personnel

<table>
<thead>
<tr>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching and research personnel</td>
<td>367,7</td>
<td>360,8</td>
</tr>
<tr>
<td>Professors</td>
<td>70,5</td>
<td>74,5</td>
</tr>
<tr>
<td>Other teaching staff</td>
<td>140,3</td>
<td>144,6</td>
</tr>
<tr>
<td>Other personnel</td>
<td>305,6</td>
<td>304</td>
</tr>
<tr>
<td>Docents/Adjunct professors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Amount of teaching given by adjunct professors (docents)
3. Internationalisation

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign degree students</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Foreign postgraduate students</td>
<td>37</td>
<td>34</td>
<td>31</td>
</tr>
<tr>
<td>Foreign personnel</td>
<td>27</td>
<td>26</td>
<td>26</td>
</tr>
</tbody>
</table>

4. Funding

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for operational expenditure (1000 €)</td>
<td>26 540</td>
<td>27 285</td>
<td>28 293</td>
</tr>
<tr>
<td>External funding (1000 €)</td>
<td>14 371</td>
<td>14 355</td>
<td>14 097</td>
</tr>
</tbody>
</table>

5. Graduate schools and educational networks

Unit as coordinator (c) or partner (p) of a graduate school or educational network in different years

- Graduate School of Biomedical Sciences, TuBS (c)
- National Graduate School of Musculoskeletal Disorders and Biomaterials (c)
- The Drug Discovery Graduate School (DDGS)
- Graduate School of Clinical Sciences (c)
- National Graduate School of Clinical Investigation (p)
- Postgraduate School of Oral Health Sciences (PeGaSOS)
- Graduate School of Nursing Science
- Finnish Post-Graduate School in Nursing Science (c)

6. How does your unit monitor the placement of graduates in working life and jobs corresponding to their education?

The Faculty frequently collects feedback with the Academic Career Services of the University and uses information of reviews made by the Finnish Medical Association. This feedback is analysed in detail by the Medical Education R&D Centre and appropriate modifications of the Programme are made if needed.
Evaluation team’s feedback to the unit

1. Mission of the unit

The mission is clearly formulated and includes targets and future perspectives as well as societal needs. The faculty seems to be a pioneer in developing teaching and has a holistic approach to the requirements of the profession. The role played by the students in the teaching culture is central. The goals for revising the curriculum are in line with the societal needs: there is a greater focus on primary health care.

There is an excellent connection between teaching and research. All the teachers carry out research and students take part in research projects. The teachers are also involved in the graduate school. The unit genuinely enhances interdisciplinarity.

The faculty fosters close interaction between students and teachers. The students are involved in all the stages of the planning and development process and in assessments. The atmosphere is very supportive.

2. Programme and course design

The curriculum has been reformed through a long and well-organised process. Clinical and biomedical sciences have been integrated vertically and horizontally into multidisciplinary modules. The programme offers the possibility of entering through other health professions, strengthening multiprofessionalism. The programme is cumulative in its organisation and also tries to strengthen social competence, e.g. through early patient contact. An additional strength is the large number of elective courses.

The faculty operates a special Medical Education Research and Development Centre, which seems to be a solid coordinating body in curriculum design and development. Humanities and social sciences are integrated into the curriculum in an exemplary way. The faculty is involved in a number of co-operative projects with various partners.

There is no teaching in Swedish. However, the course where students interview Swedish-speaking inhabitants in the archipelago seems to be well-integrated into the curriculum, and it is very appreciated by the local population.

3. Delivery of education

The faculty employs a large variety of teaching methods and supports learning through the use of IT. Clinical teaching has been decentralised to ensure students gain knowledge of community health, rather than special diseases
treated in university hospitals. One form of assessment used is feedback to assist the students in skills development. Tutoring and student self-assessment are also used. The faculty operates its own pedagogical training unit.

The assessment methods used are diverse and involve innovative practices such as OSCE. The faculty also conducts research on medical education, including teaching and assessment methods.

Tutoring is very systematic and well-integrated throughout the whole curriculum. The faculty’s tutoring system has also been implemented as good practice in other faculties at the university.

4. Outputs

The qualitative output of the programme is monitored through frequent and longitudinal analyses of the students’ study orientations, progress and professional development. Study times and employment are good. Feedback from the students is very positive. The unit has placed special emphasis on developing the students’ social and communication skills.

The results of redesigning the curriculum are excellent. Graduates seem to have greater knowledge, and better social and intercultural skills than before. Furthermore, they seem to be better equipped for working in primary health care, which is in line with the mission of the unit.

5. Continual development

There is compelling evidence of systematic collaboration between all the actors involved in continuous development and between the various faculties at the university (humanities, social sciences and faculty of education). The unit represents a good example of diverse cooperation and continuous development.

The pedagogical training for the teachers is systematic and supported by educational research. The teachers participate actively in this training.

The faculty has a clear vision of how it should further develop the education it provides. It aims to decentralise education even further and increase the use of surveys for employers and other external stakeholders, and to use IT to support teaching and learning.
APPENDIX:
Timetable of the site visits

<table>
<thead>
<tr>
<th>Applicant unit</th>
<th>Site visit</th>
<th>Experts</th>
<th>Secretary</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Helsinki, Faculty of Medicine</td>
<td>29.9.2008</td>
<td>Helen Uglow, Vesa Taatila</td>
<td>Kirs Hiltunen</td>
</tr>
<tr>
<td>University of Joensuu, Faculty of Forest Sciences</td>
<td>30.9.2008</td>
<td>Helen Uglow, Vesa Taatila</td>
<td>Kirs Hiltunen</td>
</tr>
<tr>
<td>Lappeenranta University of Technology, Department of Industrial Management</td>
<td>1.10.2008</td>
<td>Helen Uglow, Vesa Taatila</td>
<td>Kirs Hiltunen</td>
</tr>
<tr>
<td>University of Helsinki, Faculty of Pharmacy</td>
<td>2.10.2008</td>
<td>Helen Uglow, Vesa Taatila</td>
<td>Kirs Hiltunen, Kenneth Lundin</td>
</tr>
<tr>
<td>Helsinki School of Economics, Finance Area</td>
<td>3.10.2008</td>
<td>Helen Uglow, Vesa Taatila</td>
<td>Kirs Hiltunen</td>
</tr>
<tr>
<td>University of Turku, Faculty of Medicine</td>
<td>15.10.2008</td>
<td>Birute Klaas, Juhani Jussila</td>
<td>Kenneth Lundin</td>
</tr>
<tr>
<td>University of Oulu, Department of Process and Environmental Engineering</td>
<td>16.10.2008</td>
<td>Arild Raaheim, Jonas Heikkilä</td>
<td>Kirs Hiltunen</td>
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<tr>
<td>University of Tampere, Department of Regional Studies</td>
<td>16.10.2008</td>
<td>Birute Klaas, Juhani Jussila</td>
<td>Kenneth Lundin</td>
</tr>
<tr>
<td>University of Tampere, Medical School</td>
<td>17.10.2008</td>
<td>Birute Klaas, Juhani Jussila</td>
<td>Kenneth Lundin</td>
</tr>
<tr>
<td>University of Oulu, Department of Educational Sciences and Teacher Education</td>
<td>17.10.2008</td>
<td>Arild Raaheim, Jonas Heikkilä</td>
<td>Kirs Hiltunen</td>
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<tr>
<td>University of Jyväskylä, Department of Physics</td>
<td>20.10.2008</td>
<td>Stefan Bienefeld, Suvi Eriksson</td>
<td>Kirs Hiltunen</td>
</tr>
<tr>
<td>Helsinki University of Technology, Department of Computer Science and Engineering</td>
<td>20.10.2008</td>
<td>Arild Raaheim, Jonas Heikkilä</td>
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<tr>
<td>University of Helsinki, Department of Finnish Language and Literature</td>
<td>21.10.2008</td>
<td>Arild Raaheim, Jonas Heikkilä</td>
<td>Kenneth Lundin</td>
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<tr>
<td>University of Jyväskylä, Faculty of Education</td>
<td>21.10.2008</td>
<td>Stefan Bienefeld, Suvi Eriksson</td>
<td>Kirs Hiltunen</td>
</tr>
<tr>
<td>Helsinki University of Technology, Department of Biotechnology and Chemical Technology</td>
<td>22.10.2008</td>
<td>Stefan Bienefeld, Suvi Eriksson</td>
<td>Kirs Hiltunen</td>
</tr>
<tr>
<td>University of Art and Design Helsinki, School of Motion Picture, Television and Production Design</td>
<td>23.10.2008</td>
<td>Stefan Bienefeld, Suvi Eriksson</td>
<td>Kirs Hiltunen</td>
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<tr>
<td>University of Helsinki, Department of Computer Science</td>
<td>24.10.2008</td>
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<tr>
<td>University of Lapland, Department of Social Work</td>
<td>24.10.2008</td>
<td>Stefan Bienefeld, Suvi Eriksson</td>
<td>Kirs Hiltunen</td>
</tr>
</tbody>
</table>
ABSTRACT

Published by
The Finnish Higher Education Evaluation Council FINHEEC

Name of publication
Centres of Excellence in Finnish University Education 2010–2012

Authors
Kirsi Hiltunen (ed.)

Abstract
The Finnish Higher Education Evaluation Council has carried out the selection and evaluation procedure of Centres of Excellence in university education for the fifth time at the request of the Ministry of Education. The decision will be used as a basis for the allocation of performance-based funding for the next three-year performance agreement period 2010–2012. The aim is to enhance the quality and relevance of education and to encourage universities to carry out long-term development.

The performance of the units was assessed in the following content areas: mission of the unit, programme and course design, delivery of education, outputs and continual development. International interaction, cooperation across disciplinary, institutional and unit boundaries and networking were regarded as favourable factors in all the content areas.

The evaluation was implemented for the first time as a two-phase international peer review. In the first phase, the international evaluation team of four members appointed by FINHEEC assessed the applications submitted in English by the universities. The first phase was anonymous, so that the international team was not able to identify the applicants. Out of 44 applications submitted to FINHEEC, the team selected 18 best ones for the second round. In the second phase, the evaluation team was enlarged with four Finnish experts, who were paired with the foreign experts. Each pair of experts and a secretary visited 4–5 units to verify the activities described in the application and to appraise the quality of the unit's performance by means of interviews and observation.

In the performance of the awarded units, there was a great emphasis, among other things, on the pedagogical training of the teaching staff, making degrees meaningful wholes, interlinking research and teaching in the unit, versatile and international cooperation and networking in education and research as well as continual and systematic development of education.

On 13 November 2008, FINHEEC designated ten Centres of Excellence in university education for 2010–2012. This report describes the evaluation process implemented for the selection. It also includes the applications of the chosen units as well as the evaluation and development feedback on each of these units.

Keywords
University education, evaluation, quality, universities, Centre of Excellence, performance agreement period
**TIIVISTELMÄ**

**Julkaisija**
Korkeakoulujen arviointineuvosto

**Julkaisun nimi**
Centres of Excellence in Finnish University Education 2010–2012

**Tekijät**
Kirsi Hiltunen (toim.)

**Tiivistelmä**


Yksiköiden toiminnan laadukkuutta arvioitiin seuraavien sisältöalueiden osalta: yksikön perustehtävä, koulutuksen suunnittelu, koulutuksen toteutus, saavutetut tulokset ja koulutuksen kehittäminen. Kangasvälisen vuorovaikutus, yhteistyö yli yksikkö-, oppilaitos- ja tieteeralojen sekä verkostoituminen katsottiin kaikki sisältöalueet läpäisiviksi positiivisiksi tekijöiksi.


Valittujen yksiköiden toiminnan laadukkuudessa korostuivat mm. panostaminen opettajien pedagogisten taitojen kehittämiseen, tutkintojen rakentuminen englanninkielisiä hakemusyhteyksiä siten, että heidän ei ollut mahdollista identifioita hakevaa yksikköä. KKA:n määräaikaan 30.6.2008 tulleista 44 hakemuksesta valittiin 18 laadukkaita hakemusta toiselle kierrokselle. Arvioinnin toisessa vaiheessa arviointiryhmä vahvistettiin neljällä kotimaisella asiantuntijalla, jotka muodostivat ulkomaisten asiantuntijoiden kanssa työparit. Kaikkiin toiselle kierrokselle valittuihin yksiköihin toteutettiin vierailu, jonka tarkoituksena oli todentaa yksikön hakemuksesta kuvattua toimintaa ja arvioida yksikön koulutuksen laatua haastattelujen ja observoinnin avulla.

Valituksen yksiköiden toiminnan laadukkuudessa korostuivat mm. panostaminen opettajien pedagogisten taitojen kehittämiseen, tutkintojen rakentuminen englanninkielisiä hakemusyhteyksiä siten, että heidän ei ollut mahdollista identifioita hakevaa yksikköä. KKA:n määräaikaan 30.6.2008 tulleista 44 hakemuksesta valittiin 18 laadukkaita hakemusta toiselle kierrokselle. Arvioinnin toisessa vaiheessa arviointiryhmä vahvistettiin neljällä kotimaisella asiantuntijalla, jotka muodostivat ulkomaisten asiantuntijoiden kanssa työparit. Kaikkiin toiselle kierrokselle valittuihin yksiköihin toteutettiin vierailu, jonka tarkoituksena oli todentaa yksikön hakemuksesta kuvattua toimintaa ja arvioida yksikön koulutuksen laatua haastattelujen ja observoinnin avulla.

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Valittujen yksiköiden toiminnan laadukkuudessa korostuivat mm. panostaminen opettajien pedagogisten taitojen kehittämiseen, tutkintojen rakentuminen englanninkielisiä hakemusyhteyksiä siten, että heidän ei ollut mahdollista identifioita hakevaa yksikköä. KKA:n määräaikaan 30.6.2008 tulleista 44 hakemuksesta valittiin 18 laadukkaita hakemusta toiselle kierrokselle. Arvioinnin toisessa vaiheessa arviointiryhmä vahvistettiin neljällä kotimaisella asiantuntijalla, jotka muodostivat ulkomaisten asiantuntijoiden kanssa työparit. Kaikkiin toiselle kierrokselle valittuihin yksiköihin toteutettiin vierailu, jonka tarkoituksena oli todentaa yksikön hakemuksesta kuvattua toimintaa ja arvioida yksikön koulutuksen laatua haastattelujen ja observoinnin avulla.


**Avainsanat**
Yliopistokoulutus, arviointi, laatu, yliopistot, laatuyksikkö, tulossopimuskausi
SAMMANDRAG

Utgivare
Rådet för utvärdering av högskolorna

Publikation
Centres of Excellence in Finnish University Education 2010–2012

Författare
Kirsi Hiltunen (red.)

Abstrakt

Kvaliteten av enheternas verksamhet utvärderades inom följande innehållsområden: enhetens grundläggande uppgift, planering av utbildningen, genomförandet av utbildningen, uppnådda resultat och utvecklingen av utbildningen. Internationell växelverkan, samarbete över enhets-, läroanstalts- och vetenskapsgränserna samt nätverksbildning betraktades också som positiva faktorer som överspänner alla innehållsområden.


Kvalitetsaspekter som lyftes fram i de utvalda enheternas verksamhet var bland annat att enheterna satsade på att utveckla lärarnas pedagogiska färdigheter, examina strukturerades i meningsfulla helheter, forskningen och utbildningen var sammankopplade, arbetslivsspekterna beaktades i examina, undervisningsmetoderna och metoderna för bedömning av lärandet stödde varandra, utbildnings- och forskningsarbetet och nätverken var mångsidiga och internationella, och enheterna arbetade kontinuerligt och systematiskt för att utveckla utbildningen.


Nyckelord
Universitetsutbildning, utvärdering, kvalitet, universitet, kvalitetsenhet, resultatavtalsperiod
8:2000  Hara, V., Hyönen, R., Myers, D.  & Kangasniemi, J. (Eds.): Evaluation of Education for the Information Industry

1:2001  Valtonen, H.: Oppimisen arviointi Sibelius-Akatemiassa
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6:2001  Löfström, E.: Benchmarking korkeakoulujen kielenopetuksen kehittämisessä
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