



TALLINN UNIVERSITY OF
TECHNOLOGY

SELF-ASSESSMENT REPORT FOR INSTITUTIONAL ACCREDITATION

Submitted to the Estonian Higher Education Quality Agency:
22 July 2014

CAMPUS OF TALLINN UNIVERSITY OF TECHNOLOGY

LEGEND

-  Buildings of Tehnopol
-  Bus and trolleybus stop
-  Surrounding buildings
-  Café/Cafeteria
-  Roads, streets

- 1** World War II Memorial
- 2** Walking Clamshell
- 3** Courtyard and Academicians Alley
- 4** Juulius Square

SCULPTURES

- 5** „Student“. Artist Maire Morgen-Hääl
- 6** „Burning Stone“. Sculptor Lembit Palm
- 7** „Stormbird“. Sculptor Riho Kuld
- 8** „Eternal Student Juulius“. Sculptor Tiiu Kirsipuu
- 9** „Apple Nuclear Physicist“. Sculptor Rene Reinumäe
- 10** „Gear Wheel. Time Wheel“. Artist Maija Kanerva Saarnio
- 11** Memorial „Thomas Johann Seebeck“. Sculptor Aime Kuulbusch

U01 I Study Building

Main Hall, Reception, Cloakroom, Cafeteria, Lockers, ATM (SEB), Personnel Office, Marketing and Communications Office, Career and Counseling Office, Student Union, Student Organizations

U02 II Study Building

Faculty of Information Technology, Department of Physics

U03 III Study Building

Faculty of Civil Engineering, Stationery and Textbooks, International Relations Office, Public Procurement Office, Document Management Office, Coffee, soft drink and snack machines

U04 IV Study Building

Faculty of Chemical and Materials Technology, Office of Academic Affairs, Research Administration Office, Copying, Café

U05 V Study Building

Faculty of Mechanical Engineering, Department of Mathematics, Preparatory Courses Office, Facilities Management Services, Construction Management Services, Office of Economics and Finance

U06 VI Study Building

Department of Thermal Engineering, Faculty of Mechanical Engineering, Faculty of Chemical and Materials Technology, Department of Materials Science, Open University, Certification Centre, Education Technology Centre of TUT, Information Desk, Café

GEO Institute of Geology

STU Student House

Student Organizations, Hall, Bar, Archives Division

NRG VII Study Building

Faculty of Power Engineering, Department of Electrical Power Engineering, Department of Electrical Engineering, Department of Mining, Mining Museum, Rector's Office, University Council Hall

LIB Library

TUT of Technology Library, TUT Press, TUT Museum, Bindery, Technomedicum, Café

SOC X Study Building

Tallinn School of Economics and Business Administration, Faculty of Social Sciences, Centre for Economic Education of Faculty of Economics and Business Administration at TUT, Language Centre, Information Technology Services, IT Help-Desk, Cafeteria, Post Office & Souvenirs, ATM (Swedbank), Florist

SCI Building of Natural Science (VIII Study Building)

Faculty of Science, Café

ICT IT Building

Faculty of Information Technology, Institute of Marine Systems at TUT, Centre for Biorobotics, Café

CYB Building of Cybernetics

Institute of Cybernetics at TUT

MEK Mektory House

Innovation and Business Center, Café

TIM Building of Woodworking

Chair of Woodworking

CON Mäepealse Building

Laboratory Building of Civil Engineering

TEX Textile Technology Building

Chair of Design, Chair of Textile Technology

S01 Sports Hall

TUT Sport, Sports clubs, Cafe bar

STA Stadium

D01 Student Residence 1 (Akadeemia tee 5)
Kindergarten „Pallipõnn“

D02 Student Residence 2 (Akadeemia tee 7/1)

D03 Student Residence 3 (Akadeemia tee 7/2)

D04 Student Residence for Families (Akadeemia tee 5a)

D05 Residence (Akadeemia tee 7a)

D06 Student Residence (Raja 4d)
TUT Student Campus Office

D07 Student Residence (Raja 8)

HOS Academic Hostel (Akadeemia tee 11)



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ABBREVIATIONS

Abbreviation	Explanation
A/Y	Academic year
APEL	Accreditation of Prior and Experiential Learning
ASU	Administrative structure unit
AUE	Association of Universities Estonia
BF	Baseline funding for research and development institutions
CC	Curricular Committee
DoRa	European Social Fund's Doctoral Studies and Internationalisation Programme
EQW	Education Quality Working Groups
ERIS	Estonian Research Information System
EstAS	Estonian Academy of Sciences
EstRC	Estonian Research Council
EU	European Union
EULS	Estonian University of Life Sciences
IBC	Innovation and Business Centre
IRO	International Relations Office
IT	Information Technology
M&C	Marketing and Communication
MCO	Marketing and Communication Office
Mektory	TUT Innovation and Business Center Mektory
MER	Ministry of Education and Research
MSM	TUT Management System Manual
NAV	TUT accounting and personnel information system Microsoft Dynamics Navision
OAA	Office of Academic Affairs
OEF	Office of Economics and Finance
OU	Open University
PO	Personnel Office
RAO	Research Administration Office
R&D	Research and Development
STEM	Science, Technology, Engineering (and Mathematics)
SIS	TUT Study Information System
SP	Strategic Plan
SU	Structural unit
TLU	Tallinn University
TUT	Tallinn University of Technology
UT	University of Tartu

TALLINN UNIVERSITY OF TECHNOLOGY (TUT)

GENERAL INFORMATION

Name of the university	Tallinn University of Technology
Legal form	University in public law
Established	17.09.1918
Address	Ehitajate tee 5, 19086 Tallinn
Homepage	www.ttu.ee
Campus	Total in Estonia: 83.51 ha; 54 buildings (150 101 m ²) Campus in Mustamäe: 56.31 ha; 34 buildings (128 546 m ²) Main campus: Tallinn, Ehitajate tee 5 TUT Colleges: Tallinn College, Tallinn, Tõnismägi 14 Estonian Maritime Academy ¹ , Tallinn, Kopli 101 Tartu College, Tartu, Puiestee 78 Virumaa College, Kohtla-Järve, Järveküla tee 75 Kuressaare College, Kuressaare, Rootsi 7
Rector	Professor Andres Keevallik
Contact person	Kiira Parre, university quality manager +372 620 3506; +372 520 4530; kiira.parre@ttu.ee
Mission	TUT creates and mediates values that ensure Estonia's development in the globalizing world
Vision	2015: TUT will be globally recognized as a research university and a motor of economic development and innovation in Tallinn and nationwide 2020: TUT will be a leading university of technology in the Baltic Sea region and an active partner of cooperation networks of entrepreneurship clusters and public institutions
Core values	<ul style="list-style-type: none"> • Transparency and spirit of renewal • Collaboration • Professionalism

FACTS AND FIGURES

Areas of Responsibility (curriculum groups)	Architecture and Building; Business and Administration; Engineering, Manufacturing and Construction; Transport Services
Areas of Responsibility (curriculum groups) in cooperation with University of Tartu (UT)	Informatics and Information Technology; Physical Sciences
R&D key priority areas, in an alphabetical order	Chemistry and Biotechnology; Civil Engineering; Environment; Health; Information and Communication Technology; Materials Science and Technology; Mathematics and Physics; Power Engineering; Production technologies, Mechanical and Instrumental Engineering; Social Sciences (incl. Economics)
Students as of 10.11.2013	Students total: 13 050, incl. Professional higher education study: 1 153 Bachelor's study: 5 707 Integrated study: 1 142 Master's study: 3 866 Doctoral study: 782

¹ Estonian Maritime Academy as TUT College was established on 18.03.2014 by resolution no. 45 of the TUT Council. The resolution was enforced on 01.04.14. Since the self-evaluation covers the period of 2009–2013, activities of the College are not included in the self-evaluation report.

Personnel as of 31.12.2013	<p>Personnel, total: 2 139</p> <p>Employed as:</p> <ul style="list-style-type: none"> • academic personnel: 1154 • administrative and support personnel 985 <p>Academic personnel:</p> <ul style="list-style-type: none"> • Professors: 146 • Associate Professors: 140 • Lecturers/Teachers: 248 • Assistants: 76 • Lead Research Scientists: 20 • Senior Research Scientists: 243 • Research Scientists: 204 • Early Stage Researcher: 77
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Organisation

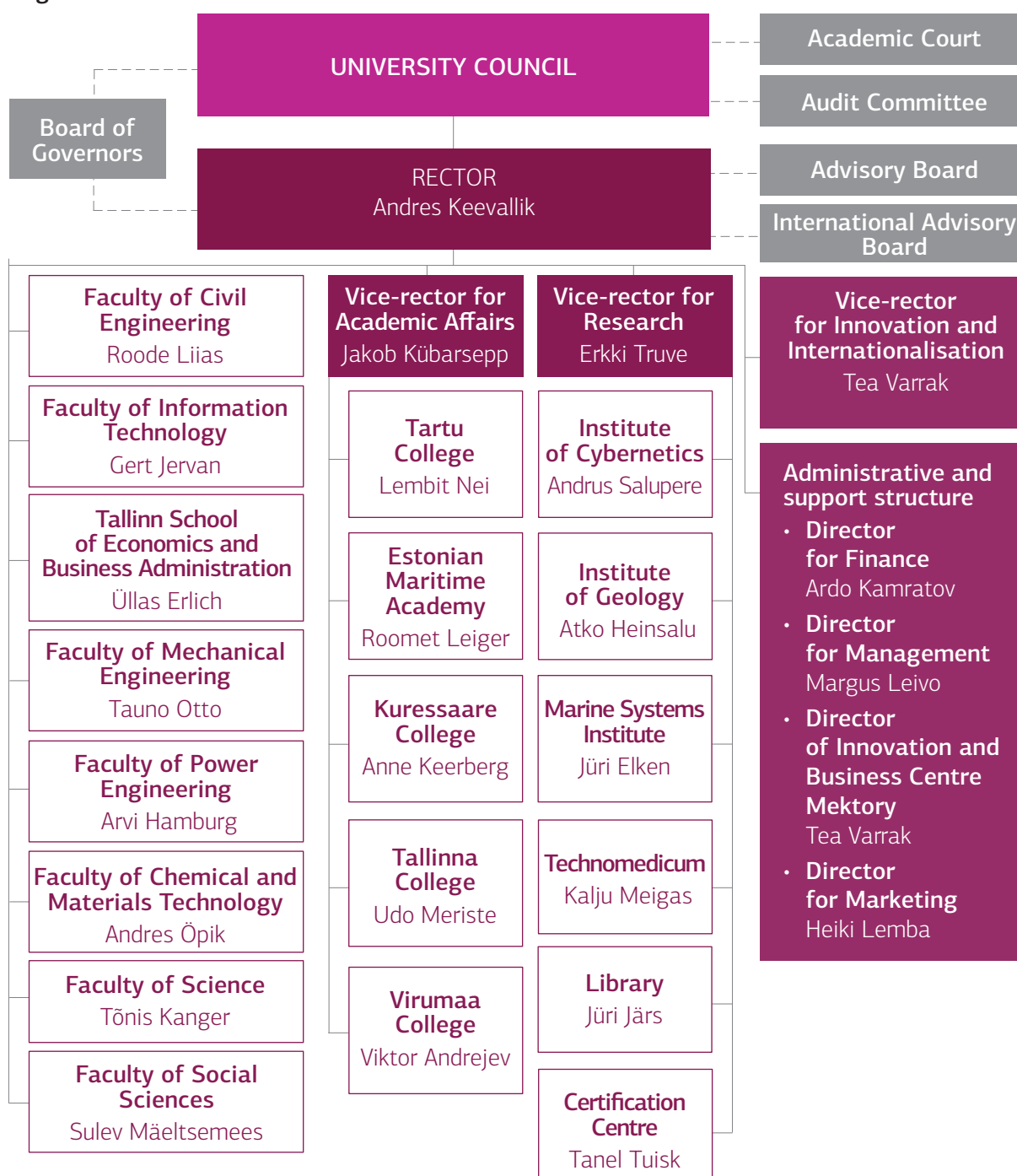


Figure 1 TUT organisational structure

HISTORY

History of TUT dates back to 17 September 1918 when the Estonian Engineering Society opened an engineering school called Special Engineering Courses where the language of instruction was Estonian. Qualification of the university was granted to Tallinn University of Technology in 1936 (see [History](#)). The status of a university in public law in public law was granted on 12 January 1995 by the Universities Act. On 04 June 2014 the Estonian parliament has adopted the Tallinn University of Technology Act that defines the role of TUT in the Estonian education and research landscape as well as the institutional management structure. The Act will take effect from 1 September 2014.

MAIN ACHIEVEMENTS IN 2010–2014

2009–2012 successful transitional evaluation of the study programme groups. *All the bachelor, applied higher education, master and integrated programmes currently open for admission were granted validity for an unlimited term. Out of ten, eight doctoral programmes were granted validity for an unlimited term.*

2010 successful evaluation of research and development (R&D) activities. *In all areas (bio- and environmental sciences, natural sciences and technology, health research, social sciences and culture) positive decision was adopted.*

Tarmo Uustalu was elected member of the Estonian Academy of Sciences (EstAS).

National Science Prizes were granted to: professor emeritus Arvo Ots for Long-standing Achievements in R&D in the area of Thermal Power Engineering; research group: Rein Kuusik (leader), Andres Trikkel and Tiit Kaljuvee in engineering sciences.

2011 Jakob Kübarsepp, professor of materials technology and Margus Lopp, professor of organic chemistry, were elected members of the EstAS.

National Science Prizes were granted to: Ülo Lille for Long-standing Achievements in R&D in the area of biochemistry; Peep Palumaa in the area of chemistry and molecular biology; Mart Min in engineering sciences.

2012 Jaan Janno was granted the National Science Prize in exact sciences.

2013 Activity in Tallinn has been centralised on the Mustamäe campus.

According to QS World University Ranking, TUT was established among 450 world's top universities.

Andres Õpik, professor of physical chemistry, was elected member of the EstAS.

National Science Prizes were granted to: Enn Mellikov for Long-standing Achievements in R&D in the area of materials science; Tarmo Soomere in engineering sciences; Rainer Kattel in social sciences.

2014 The *Riigikogu* (Parliament of Estonia) has adopted the Tallinn University of Technology Act that will be enforced from 1 September 2014.

National Science Prize in engineering sciences was granted to the research group: Dmitri Vinnikov (leader), Indrek Roasto and Tanel Jalakas.

TUT KEY PARTNERS:

- Higher educational institutions in Estonia and abroad under cooperation agreements
- R&D institutions under cooperation agreements
- Estonian general education schools (TUT partner schools by agreement)
- Business partners under cooperation agreements
- Professional societies and unions under cooperation agreement
- Businesses, foundations, non-profit organisations and other legal persons that incorporate TUT as a shareholder or a founding member
- Competence Centres with TUT participation
- International networks with TUT partnership
- Clusters with TUT as partner
- Regional Competence Centres under cooperation agreement

TUT STAKEHOLDERS:

- Membership, incl. students
- Alumni
- The *Riigikogu* and the Government of Estonia and different governmental institutions
- Local governments
- Public decision-making institutions and bodies
- Enterprises and other profit-earning organisations (incl. from abroad)
- Employers' societies
- General education schools and other educational institutions
- Cultural and sports organisations
- General public

PREPARATION FOR INSTITUTIONAL ACCREDITATION

To be well prepared for the institutional accreditation, incl. furthering the quality management system and defining strengths and areas for improvement, TUT participated in the project “Quality management in higher educational institutions” in the frame of [ESF programme Primus](#). As a result, improvements were introduced into the TUT management system and the [Management System Manual](#) (MSM) was initiated.

Preparation process of institutional accreditation was coordinated by the the Quality Manager Kiira Parre, supported by the leading group composed of Jakob Kübarsepp, Vice-Rector for Academic Affairs; Erkki Truve, Vice-Rector for Research; Andrus Salupere, Director of the Institute of Cybernetics; Ardo Kamratov, Director for Finance. The action plan fixed the time schedule. In the Self-assessment Report, contributions were made by activity area working groups (institutional management, teaching and learning, continuing education, R&D, personnel management, financial resources, infrastructure, international relations, marketing and communication (M&C), public-oriented services, ICT, and internal data bases). Personnel Office coordinated staff workshops.



1 ORGANISATIONAL MANAGEMENT AND PERFORMANCE

1.1 GENERAL MANAGEMENT

1.1.1 TUT ROLE IN THE ESTONIAN SOCIETY

In the Estonian society TUT is recognised as an internationally high-ranked research university, providing quality research-based education, accountable for the new generation of engineers, the spirit and quality of engineering culture in Estonia and promoting sustainable development of the society and growth of national welfare by the innovative services (see [Statutes of TUT](#), [TUT Strategic Plan](#) (SP)).

To realise its role, TUT provides opportunities for acquisition of higher education in line with developments of science and technology at all cycles in the areas of natural and exact sciences, engineering, manufacturing and technology, social sciences and in related areas. TUT fosters R&D in these areas, at the same time creating a synergy between different areas. TUT is a leading engineering and technology education and research centre in Estonia; TUT research activity has been granted positive evaluation in all four broad research areas (natural sciences and engineering and technology, bio- and environmental sciences, health sciences, society and culture).

In addition to its main role in the study and research activities, TUT has defined its major public-oriented tasks: act as a technology transfer centre within areas of competence; participate actively in science, education and innovation policy formation; offer life-long learning opportunities; popularise science, technology, engineering and mathematics (STEM) broad areas; support national regional developments through colleges outside the capital; facilitate functions of culture and sports.

According to the contract under public law concluded with the Ministry of Education and Research (MER), TUT is accountable or co-accountable for provision of university level education in Estonia in the study programme groups of architecture and building; business and administration; engineering, manufacturing and construction; transport services; informatics and information technology (IT); physical sciences. As a result, a remarkable share of students and graduates in the broader areas of engineering, manufacturing and construction, science, and social sciences, business and law are derived from TUT (Figures 2 and 3).

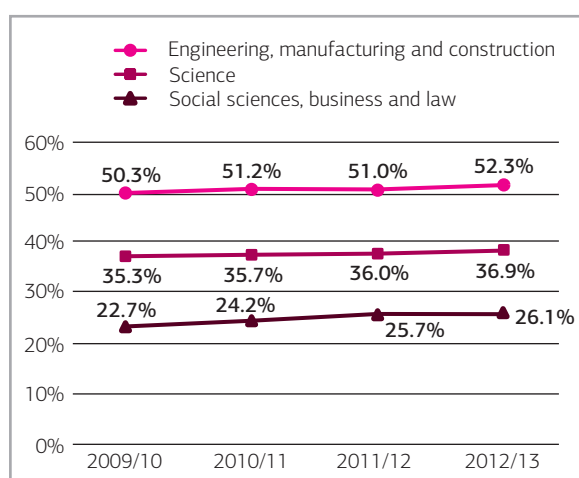


Figure 2 Proportion of TUT students in Estonian Student Body

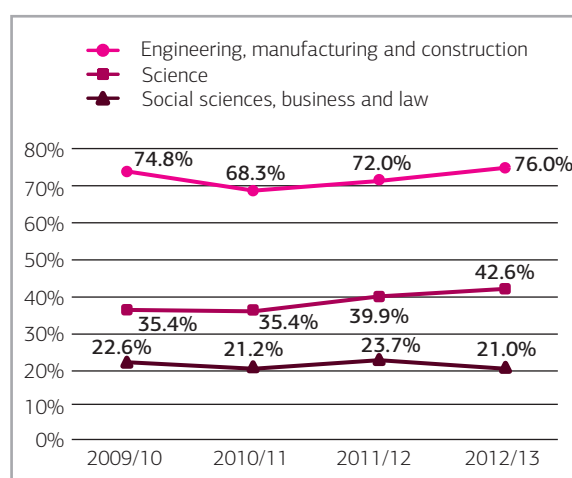


Figure 3 Proportion of TUT master's and doctoral degree graduates in the national higher education graduate composition

Source: <http://www.haridussilm.ee/>

TUT alumni role in the Estonian society is remarkable. Among the alumni is one Prime Minister of the Republic of Estonia, tens of ministers, one President of the EstAS, three winners of Olympic Games, numerous business, policy, culture and sports leaders. TUT graduates' success is demonstrated by their high proportion within 500 wealthy persons in Estonia (27% in 2014).

In its role as a technology transfer centre, TUT has demonstrated very successful performance in contract-based research projects. According to the analysis of the Archimedes Foundation², in several R&D key areas (e.g. mechatronics and automation, power engineering, production engineering and management, civil engineering, electrical engineering and electronics, chemistry and chemical engineering, electronics, materials science), in the last years, the volume of TUT's contract-based research constituted a substantial share within related areas of Estonian R&D institutions. TUT Certification Centre is the major certification service provider in the area of building materials.

To promote implementation of strategic programmes of national defence, TUT initiated creation of TUT Centre for Defence and Security Studies. The centre is coordinating participation of TUT research staff in the NATO, European Defence Agency and in other defence and security related research centres.

1.1.2 BASES OF TUT STRATEGIC PLANNING

Strategic planning is an essential activity in TUT. This area falls within the responsibility of the Rector. From 2000 in succession, three five-year SPs have been drafted. Current strategic planning is based on the provisions made in [TUT MSM](#). Figure 4 shows SP and action plan preparation and analysis of implementation.

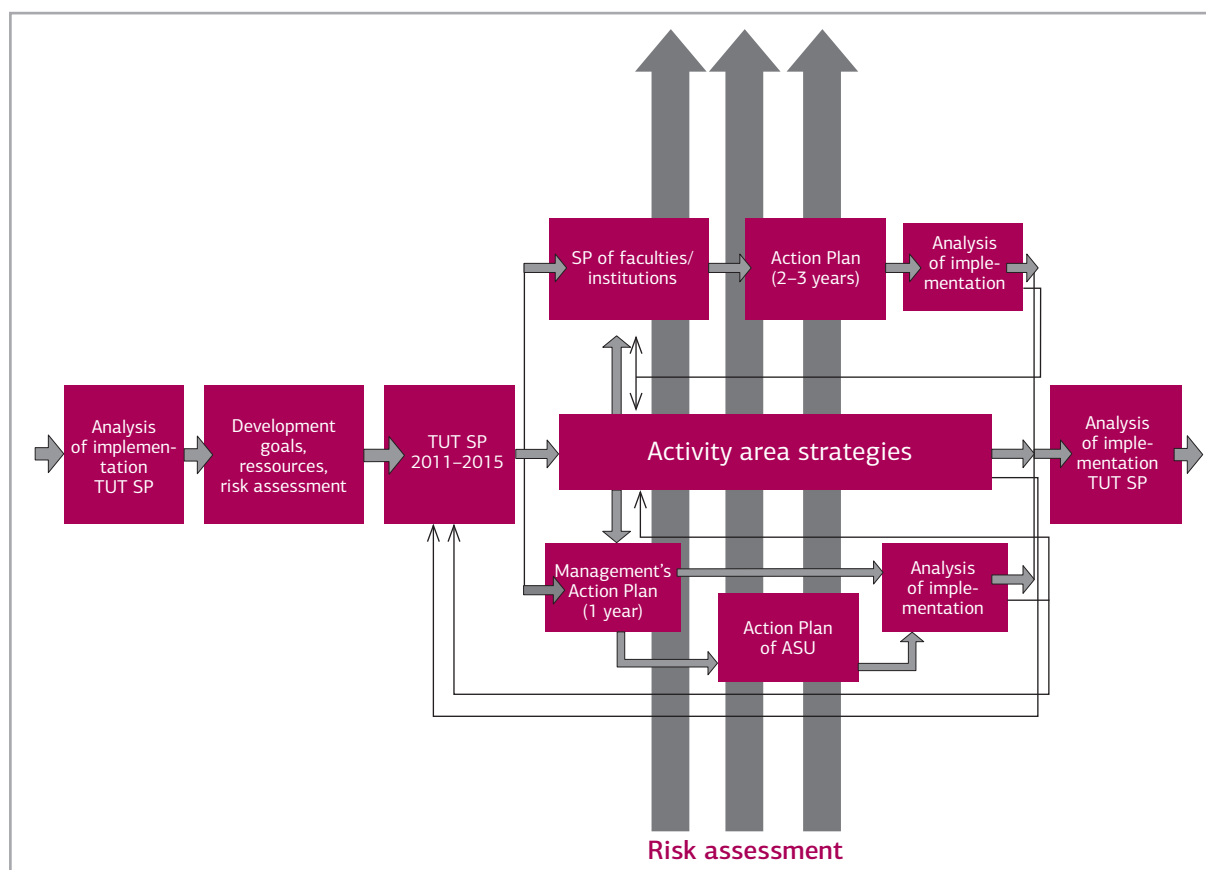


Figure 4 Structure of TUT strategic planning

TUT SP and strategy formation arise from the mission, vision and core values, national strategies in conformity with EU directions and expectations of the society, entrepreneurs and other stakeholders. Representatives from the society and entrepreneurs are engaged in management bodies at different levels, in the SP preparation process and feedback surveys. Of substantive importance in strategy planning and implementation activities are “Estonia 2020” Competitiveness Strategy, Estonian Higher Education Strategy and Estonian R&D and Innovation Strategy “Knowledge-Based Estonia”.

² An independent body established by the Estonian government with the objective to coordinate and implement different international and national programmes and projects in the field of training, education and research

SP is based on a coherent development of academic quality and work organisation in pursuit of enhanced efficiency. SP provides main objectives and decisions of principle for the term of SP and defines goals in R&D, teaching and learning, society-, strategic policy- and entrepreneur-oriented directions, as well as in institutional management and economic activity. A novel feature in the current strategic planning system is a uniform structure and quality introduced in the faculty/institution SPs.

For the university to ensure viable planning and sustainable development, SP, strategy and action plan preparation/amendment is preceded by the analysis of the influences of external environment, resource planning for previous five years and forthcoming years and risk assessment. Current SP period has seen developments towards more systematic risk management, which is linked to the implementation of goals in the TUT SP and action plans.

1.1.3 TUT KEY RESULTS

TUT main objectives to be assessed are defined in the [TUT SP and strategies of activity areas](#). Key results (Table 1) are constituted in performance indicators established in the SP. Implementation of key results is realised through TUT structural units (SU) activities and objectives defined in SPs.

Table 1 TUT key performance indicators

Key performance indicator	2010	2011	2012	2013	Goal 2015
Research and development activity					
1. Number of pre-reviewed science publications ³ per one full-time academic position	0.92	0.97	1.03	1.02	1.30
2. Proportion of foreign academic staff in overall academic staff	6.2%	6.9%	8.2%	10.0%	10.0%
3. Contest to professors' positions	1.04	1.38	1.14	1.32	1.50
4. Proportion of R&D budget in the overall study and R&D budget	45%	49%	51%	52%	over 50%
5. Enterprise contract volume	2.7 mln €	3.6 mln €	3.8 mln €	4.6 mln €	5.2 mln €
6. Number of doctoral theses defended	45	60	67	54	90
Teaching and learning activity					
1. Proportion of TUT students (excl. continuing education students) in Estonian Student Body	20.2%	20.8%	21.7%	21.8%	25.0%
2. Proportion of student dropouts in total student body	16.7%	14.5%	18.6%	19.1%	11.0%
3. Proportion of international students by cycle (master's and doctoral study)	3.7% 4.5%	5.1% 6.5%	6.2% 7.6%	8.2% 7.8%	8.0% 10.0%
4. Monetary volume of continuing education (incl. open education)	1.8 mln €	1.8 mln €	2.0 mln €	2.4 mln €	2.6 mln €

Performance of strategic objectives is subject to annual review. Performance indicators are analysed in the annual reports of R&D and economic performance (endorsed by the TUT Council). Both the report on teaching and learning and continuing education are prepared. At the opening meeting of the academic year (yearly, end of August), the Rector presents his report to the university community.

Reference universities have been selected to facilitate comparison of TUT advancement on the global scale and with the Baltic Sea area leading universities of technology. Of national universities, the UT serves as reference, on a regular and unified methodology basis, key performance indicators are compared. In 2014 it is planned to introduce a comparative activity with selected foreign universities (e.g. Aalto University, KTH Royal Institute of Technology, Riga Technical University), its extent depending on

³ According to the classifier (1.1, 1.2, 2.1, 3.1) of the Estonian Research Information System (ERIS) adopted by the Directive of the MER No. 704 of 30.07.2009

the indicator comparability and public accessibility. To analyse the competitiveness on the international university landscape, from 2013 TUT participates in international rankings.

1.1.4 PREPARATION AND IMPLEMENTATION OF TUT STRATEGIC PLANNING AND ACTIVITY PLANS

A leading role in the Institutional SP preparation is with the working group assigned by the Rector, composed of all activity area leaders⁴, representatives of university membership and other stakeholders. SP draft is subject to discussion with TUT members, the Board of Governors, and external stakeholders. Results of the discussions form the agenda of the institutional development conference. SP is adopted by the TUT Council. To ensure consistency in the strategic planning process, complimentary development trends (interim strategic vision for the first years of the next period) are prepared. The strategic vision prepared by the Rector's Office is approved by the Rector. Relevant information is communicated to the Council and membership. In 2009, an [interim strategic vision](#) "TUT in 2020" was composed by two groups of young scientists and teaching members. In 2014 [Strategic Directions up to 2017](#) were drafted.

Preparation of [activity area strategies](#) is coordinated by the activity area leaders.

Preparation of the SP of a faculty/institution is coordinated by the dean/director pursuant to the institutional SP, adopted by the council of relevant SU and approved by the Rector. In view of faculty/institution autonomy in management decision-making, SU strategic documents provide additional strategic objectives to the TUT SP. Action plans of a faculty/institution drafted for 2–3 years are submitted for consideration by the Strategy Committee.

Active student participation in the strategic planning process and strategic document adoption is the common practice (through Student Union, faculty/college councils, student councils and TUT Council). Derived from institutional SP, [TUT Student Body drafts own five-year SPs](#) and main action plans for an academic year (A/Y). TUT student movement is featured by advancement and strength against Estonian background. TUT Student Body is one of the most active members of the Federation of Estonian Student Union.

Institutional SP implementation is based on activity area strategies, SU SPs and different action plans (incl. management, administrative and support units (ASU)) through R&D, teaching and learning, public-oriented services and major support processes (detailed in relevant parts of MSM). In SP implementation and required decision-making, TUT takes into account feedback from stakeholders.

SP implementation is reviewed by the Strategy Committee, assigned by the Rector and composed of the representatives of the Rector's Office, membership and students. The Committee coordinates also preparation of SPs of SUs and action plans, evaluates their performance and reports to the Rector for the whole five-year period. Need for planning of improvement activities, incl. requirements for SPs and strategy amendments, arises from the results of the analysis. Upon the Rector's recommendation, amendments are processed with the participation of university membership and if required, with the representatives of stakeholders and corresponding to substance of the amendment, in the council committees.

1.1.5 MANAGEMENT LIABILITY ON DIFFERENT LEVELS

Bases of management, structure, functions and responsibility of governing bodies are prescribed in the Universities Act, Statutes of TUT and Statutes of SUs. A comprehensive review of core process performance, organisation of management and persons responsible is provided in [MSM](#).

TUT is directed by the Rector who is responsible for the general state and development of the university and for the lawful and expedient use of financial resources. The Rector has delegated management of the academic sphere to the Vice-Rectors: for Academic Affairs, Research, and Innovation and International Relations, economic management to the Directors: for Finance, Facilities and Marketing. Their functions and responsibilities are prescribed by Rector's directive and they coordinate their management sphere through ASU. Substantive strategic issues are subject to consideration between the

⁴ activity area leader – person accountable for the activity area strategy (strategies of teaching and learning, R&D, innovation and internationalisation, personnel, marketing and communication, and IT), respectively Vice-Rector for Academic Affairs, Vice-Rector for Research, Vice-Rector for Innovation and International Relations, Head of Personnel Office, Director for Marketing, and Head of IT Office.

Rector and the Advisory Board. To promote implementation of internationalisation goals, the Rector has formed the International Advisory Committee.

[TUT Council](#) is a collegiate decision-making body. Rules for formation, competence and basics of activity are provided in the Statutes of TUT. Working bodies of the Council are four standing committees: Committee for Academe, Academic Affairs, Research, and Economic Affairs.

[TUT Board of Governors](#) is an advisory body that acts as an interface, liaising TUT and society's expectations substantive to the university management. However, the present role of the Board of Governors is relatively ambiguous because of inadequate participation in the decision-forming and adoption related to institutional strategic management and insufficient support in fostering university's interests on the national decision-making level.

TUT Academic Court composed of five members, elected for three years by the TUT Council, resolves internal academic disputes that may arise.

Academic SUs are administered by the deans/heads/directors who are responsible for the development and operation of the SU. Major management decisions are subject to adoption by the SU Council according to Statutes of SU. The Council involves members from outside TUT to ensure consideration of society's and stakeholders' expectations. The management system enforced does not provide for the definition of the responsibilities of the deans in all management areas. An analysis and decisions are required to establish the size of load for academic SU leaders (full or partial; currently it is an additional work responsibility) and management qualification.

TUT has set forth several legal persons supporting basic activity (who offer public-oriented services as well): provision of accommodation, hostel management and development; organisation of sports activity and management of sports structures; organisation of cultural activity; support to university activities from alumni and scholarships to students; development of alumni movement. Relevant governing bodies involve representatives of TUT management.

According to SP, a recommendation from the TUT Council was submitted to the MER to initiate drafting of TUT Act. The Act⁵ will regulate TUT's legal position (university in public law), objectives and tasks, main directions of study and R&D activity (leading engineering, technology and research university in Estonia), state budget financed professors' positions in engineering and technology engaged in teaching and R&D as well as issues related to the management system and other bases of institutional activity.

1.1.6 TUT INTERNAL AND EXTERNAL COMMUNICATION (INCL. MARKETING AND BRANDING)

TUT communication activity (*incl. marketing and image building*) (M&C) arises from [TUT SP](#) and [TUT M&C Strategy](#). Coordination and organisation of the area is the responsibility of Marketing and Communication Office (MCO) pursuant to the Statutes of MCO and different SU basic documents. Management in the area involves admission marketing, brand building, R&D popularisation (see [MSM](#)) and additional support process management. Area management lies with the Director for Marketing, excl. international student recruitment and innovation and entrepreneurship related marketing that is under Vice-Rector for Innovation and International Relations. As a member of TUT management, Strategy Committee and decision-making bodies (pre-evaluation committees, Council of Open University (OU) etc.), the Director for Marketing participates in activity area strategy preparation, facilitating liaison of M&C activity with other activity area strategies.

Adoption, implementation and amendments to the M&C strategy processed by the TUT Committee for Insignia are coordinated by the Strategy Committee, endorsed by the Rector. Based on the M&C strategy, MCO prepares a yearly action plan and M&C area action plans (brand, marketing and sales, communication, e-channels). SUs will set forth goals and activities related to M&C activity in SU SPs and in action plans. Monitoring function for the implementation of M&C action plans lies with the institutional management, M&C area cooperation and activities are subject to quarterly discussion in the marketing working group (representatives of academic SUs, Office of Academic Affairs (OAA), Preparatory Courses Office, OU, International Relations Office (IRO), Innovation and Business Centre (IBC), and MCO).

⁵ Enters into force from 1.09.2014

To enhance internationalisation of TUT student body, study opportunities are advertised in major international study portals and in e-marketing channels of potential student countries. Jointly with IRO, independent or collaborative efforts with other Estonian higher educational institutions in the framework of the cooperation platform *Study in Estonia*, active marketing is implemented (fairs, briefings, consultations, receptions). Teaching members, students and alumni are involved.

Internal communication is facilitated by TUT Intranet to communicate internal and external news and ensure access to work-related information and to raise and comment current issues. A weekly news issue is communicated to staff. TUT holds a mailing-list system intended for communication between narrower staff target groups. Monthly TUT newspaper is issued, noticeboards in each building communicate news/events, focused information hours are organised.

According to employee job satisfaction survey, as compared to 2013, satisfaction with internal communication has decreased slightly in 2014 (from 86.6% to 84.9%).

TUT [website](#) (changed in 2012, basic principle: client/visitor centre) contains general information, information for all target groups in more than 400 sub-websites. A special virtual environment and a newsletter (over 10 000 readers) is available for TUT alumni from early 2012. A future target is to attract TUT foreign alumni into alumni movement.

TUT uses the media monitoring and news information system service (ETA Monitoring⁶, Baltic News Service), which can be ordered to personal e-mail address. Quarterly and yearly summary reports on monitoring are submitted to MCO to analyse performance and to recommend improvements.

[Consistent investigations and surveys](#) are conducted among school students, alumni and employers. Focus is on the following: school student preferences regarding to universities and option monitoring, alumni expectations related to alumni movement and services and activities, convenience of TUT website use, public opinion survey and media monitoring and image building and its components. Surveys cover also newly enrolled student feedback concerning programme choice and communication and marketing activity (results communicated to the TUT marketing working group). Information received is stored in MCO, the results are analysed and used in new action plan and strategy preparation.

International branding (selection of partner universities, joining networks etc.) is based on the co-action of consistent substantive international collaboration and M&C tools.

IMPLEMENTATION OF STRATEGIC OBJECTIVES IN THE M&C AREA:

- **Quality enhancement of applicants and increase in market share**

Objective 2015: to recruit better prepared students, at the same time increasing market share of student body in Estonia up to 25%

To recruit best prepared and motivated student candidates, it is common practice to hold such information events as lectures, seminars, workshops, programme introductions, open door days, excursions in cooperation with TUT students, staff, alumni, and employers. Ongoing programme concentrates on recruiting young people with higher potential than average and their early connection with TUT. In 2013 TUT student proportion in the Estonian student body increased to 21.8%. 74% of TUT newly admitted students collected more than 60 points at the mathematics state exam, 35% collected over 80 points.

A decrease of national student candidates resulting from Estonia's demographic situation is compensated by successful international student recruiting.

- **Promotion of TUT brand and image recognition**

Objective: to promote TUT brand recognition

The following activities serve for the implementation of the objective: yearly wide-scale branding campaigns, analysis of market segments, cooperation with marketing research company TNS Emor, specific brand communication activities, updated CVI⁷ and media channels etc. TUT brand awareness among Estonian population has risen consistently: in 2010: 39%, in 2014: 51%. Frequency of news from TUT in the media has grown from 2011: 4235 times to 2013: 5000 times.

⁶ Estonia's leading provider of comprehensive media monitoring and analysis service

⁷ CVI – Corporate Visual Identity, brand and visual identity

STRENGTHS OF SUB-PROCESS 1.1:

- TUT functions as the leading university of technology, which is confirmed by the share of programme group students under TUT's responsibility and graduates in the Estonian student body as well as by substance of R&D in Estonia.
- Strategic planning and management system ensures realisation of the plans in general terms; MSM was prepared to enhance institutional management performance.
- Through good cooperation with the Student Union students are actively involved in debates and the decision-making process.
- TUT Act that defines areas of responsibility and bases for the development of institutional management and financing had been adopted.
- TUT communication activity is goal-oriented and under control, TUT brand recognition is on the rise.
- TUT has the largest international student body in Estonia. In 2013/2014 A/Y 351 new international students were enrolled, over a half were admitted to the master's and doctoral study.
- Student movement is featured by advancement and strength. The Student Body has their strategic and operation/activity plans.

IMPROVEMENT ACTIVITIES OF SUB-AREA 1.1

- To foster strategic planning, improve interaction between different strategic documents; to raise awareness of each staff member regarding to the significance of strategic planning.
- To further the institutional management model (increasing the role of the Board of Governors and the faculty) and optimisation of the structure.
- To prepare TUT's crisis communication plan that will regulate staff behaviour in case of an event or situation targeted to a possible harm to the image of TUT.
- To provide availability of external and internal communication, information materials and channels in English.

1.2 PERSONNEL MANAGEMENT

Personnel management is an area under the Rector's control, coordination of activity and data management lies with the Personnel Office (PO) acting according to the Statutes. On the operational level, personnel management is directed by the heads/directors of SUs whose tasks and responsibility are defined in the Statutes of SU, other internal regulations and employment contracts. According to the Job Descriptions of Academic Staff, provision of new generation academic staff is a professor's basic responsibility.

Strategic options in personnel management are selected primarily in the process of activity area strategy preparation arising from TUT SP. More important internal regulations in the area are as follows: Personnel Strategy, Work Procedure Rules, Salary Rules of Tallinn University of Technology, Rules for Elections and Professional Reviews, Job Descriptions of Academic Staff, Regulation of Work Health and Work Safety Organisation, TUT Collective Agreement. Legislation on personnel management is accessible in TUT document register and on the TUT website.

1.2.1 PRINCIPLES AND PROCEDURES FOR EMPLOYEE RECRUITMENT AND DEVELOPMENT

Objective: to ensure consistency in academic staff and leaders' renewal, optimal and purposeful personnel size to support the achievement of institutional purposes

Principles of selecting and appointing **academic staff** are defined in the Rules for Elections and Professional Reviews. Positions of professors and leading research scientists are created by the TUT Council; other positions of academic staff by the Rector/institution's director. SU leader's responsibility is at least once yearly evaluate need for SU personnel. Summary evaluation results are kept in PO and analysed in cooperation with the deans. According to general practice, contest to academic positions is announced on TUT website in Estonian and English and on EURAXESS. Candidates to professors' and leading research scientists' positions are reviewed by foreign experts and elected by the TUT Council. Candidates to other positions are reviewed by expert committees, containing at least one external member and elected by the faculty/institution council.

Recruitment of **non-academic staff** is organised by PO, with the SU leader's participation. As a rule, support staff posts are filled on the basis of open contest. A special new employee programme in the format of an information day that introduces institutional mission, vision and values as well as key area activities has been implemented.

To find areas required for further training and development, PO analyses student feedback and feedback from evaluative communication, evaluations of management members and immediate leaders, personnel recommendations, feedback from training/seminars and recommendations from mentors and internal training staff. Employee satisfaction with the career, professional and personal development opportunities is monitored. The results provide for policy formation and practices in the personnel area and in the development and training activity.

Training courses, seminars and development activities are arranged for all employee target groups. The area of personnel education and development is coordinated by PO in cooperation with OU, TUT Estonian Engineering Pedagogy Centre, Education Technology Centre, TUT internal trainer and mentor network, and UT and Tallinn University (TLU) key persons of continuing education centres. Under programme partnership, cooperation is advancing with the higher education quality enhancement programme Primus, life-long learning programme Erasmus, doctoral studies and internationalisation programme DoRa. A special TUT training website page comprised of the training plan, training materials, e-training and feedback and training statistics promotes the training and development activity.

Priority in the development activity has been given to the mentoring system created recently. In addition to improvement of pedagogical skills, academic staff and doctoral students are offered an opportunity to improve their knowledge and skills in foreign languages. International teaching staff members are taught courses of Estonian language and culture. A young leader reserve development programme with consulting opportunities has been implemented. A consistent approach to improvement of e-courses for academic and study auxiliary staff has been implemented.

Personnel data are stored in the *up-to-date* personnel programme NAV⁸, intended for data presentation by segment at any time moment. Recent five years have seen an increase in research staff number. Efforts have been made to keep the proportion of non-academic staff in overall staff under 50% (Figure 5).

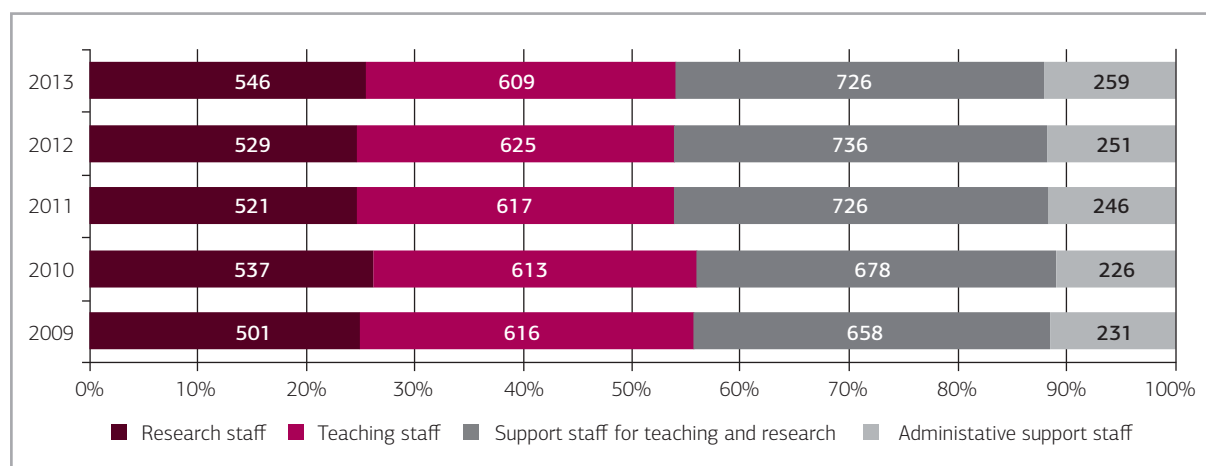


Figure 5 Staff number and proportion by position type (academic and research support staff). Source: NAV

IMPLEMENTATION OF PERFORMANCE INDICATORS FOR ACADEMIC SUSTAINABILITY:

• Internationalisation

Objective 2015: to achieve a proportion of at least 10% of international academic staff⁹ in academic staff

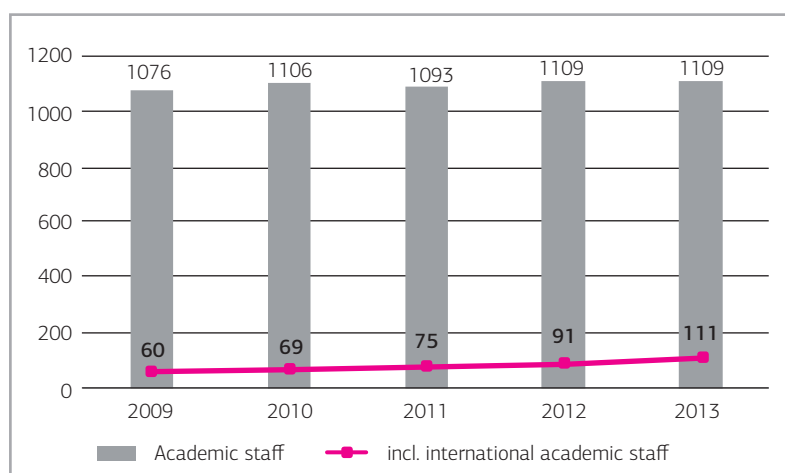
Supported by different programmes (DoRa, Mobilitas etc.) and projects, TUT has recruited academic staff from abroad to strategic areas through international academic contest. Contacts established

⁸ TUT accounting and personnel information system Microsoft Dynamics Navision

⁹ A foreign scientist/professor shall be a researcher or a teaching staff member whose employment contract is valid at 31 Dec. and who has no Estonian citizenship and whose citizenship originates from another country. The proportion of the named staff shall be calculated from the overall number of academic staff at the end of the calendar year.

both through EU and R&D support and scholarship programmes in different countries facilitate sustainable cooperation and longer-term visits of visiting scientists. Among the named (e.g. [ERA Chair](#), to be opened in TUT in 2014) are those for recruiting international top level scientists. To communicate and introduce support programmes, administrators of different funding instruments are invited in the format of information days.

In addition to involving foreign professors and top scientists, through different national measures (Estonian Research Council (EstRC) post-doctors, EstRC scheme ERMOS) and EU (Marie Curie), young scientists with doctoral degree received from abroad have entered post-doctoral study at TUT. Visiting teaching members include practitioners both from Estonia and abroad: in 2013/14 A/Y 10 visiting professors from various foreign countries were staffed.



The purpose set forth (10% to 2015) for 2013 has been achieved (Figure 6), however, the proportion of foreign academic staff by faculty is uneven. In 2013 foreigners from academic staff made up 20% at the Institute of Cybernetics, 19% at the Faculty of Social Sciences, but the proportion in the Faculties of Civil Engineering, Information Technology and Science is below 5%.

Figure 6 Number of international teaching and research staff at TUT. Source: NAV

• Employee age structure

Objective: proportion of academic staff under 50 years of age in academic staff growing (>53%)

TUT has promoted starting young staff academic career development: creation of early stage researcher positions, raising minimum wage rate for new doctoral degree holders, favourable conditions after parental leave at return etc.

In the recent years, the age structure of academic staff has moved in the direction aspired: academic staff in the 35–44 years of age has grown considerably (Figure 7), resulting in the increased proportion of academic staff under 50 years in overall academic staff (Figure 8). Average age of academic staff by faculties and institutions is uneven: academic staff under 50 years of age accounted for 69.1% at the Faculty of Mechanical Engineering, at the same time at the Institute of Geology – 24.6% and at the Faculty of Science – 48.1%.

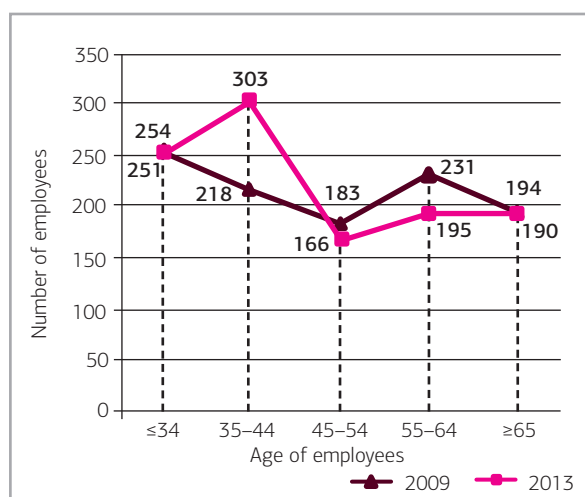


Figure 7 Structure of academic staff by age (2009; 2013). Source: NAV

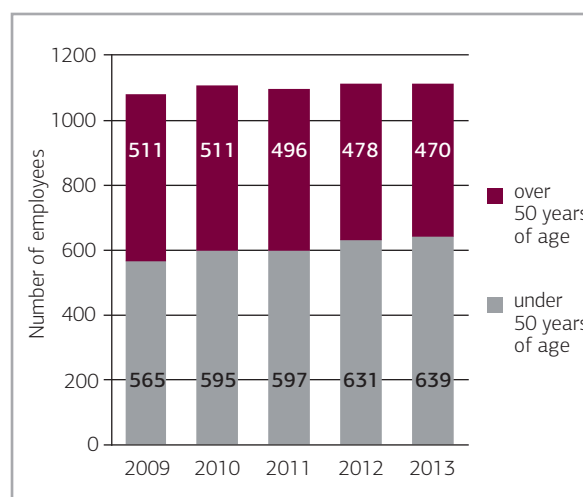


Figure 8 Proportion of academic staff under/over 50-years of age. Source: NAV

- **Contest of academic staff**

Objective 2015: contest rate to a professor's position¹⁰ increases to 1.5



The last five years have seen a higher rate of contest to a professor's position (Figure 9), which primarily results from international contests to the newly created professors' positions at the IT Faculty (2012 – 3.0; 2013 – 4.5). In other faculties the same rate is 1, which impedes achievement of the objective 2015.

Figure 9 Contest to professor's positions. Source: Personnel Office

- **Employee satisfaction with development opportunities**

Objective: employee satisfaction with professional development and career opportunities is increasing/stable

Employee training plans prepared by PO are publicised on TUT website training entry. In the recent years overall participation in training and employee satisfaction with professional development opportunities has remained stable, however, satisfaction with self-development opportunities has decreased slightly (Table 2).

Table 2 Satisfaction with professional development and career opportunities, sub-factors (%)

Sub-factors	2010	2011	2014
Satisfaction with opportunities for professional development	79.3	79.0	78.9
Satisfaction with opportunities for individual development	83.7	81.8	81.2

Source: Job satisfaction surveys 2010, 2011, 2014

1.2.2 SELECTION, APPOINTMENT AND EVALUATION OF ACADEMIC STAFF

Objective: qualifications of academic staff conform to the agreed qualification requirements, demonstrate professional quality and activity in the specific field on international level

Requirements for applying for an academic post, job descriptions, rights, responsibilities, expected performance indicators, principles of reporting and evaluation of performance results are provided in the [Job Descriptions of Academic Staff](#). Duties and work load distribution between different work segments are agreed upon in the employment contract according to the specificity of the post and the SU. Guidelines for evaluation of academic staff performance and related rules in faculties/institutions have been drafted. Requirements applicable to candidates to academic posts or employee evaluation on a balanced rate take into account previous academic activity of the candidate/employee, incl. student feedback in the Study Information System (SIS), results in supervision of doctoral theses, number of publications etc.

An independent expert review committee is formed for selection/appointment or for employee performance evaluation as defined in the [Rules for Elections and Professional Reviews](#).

¹⁰ Number of candidates per contest for one professor's position as a yearly average

1.2.3 PRINCIPLES OF REMUNERATION AND EMPLOYEE MOTIVATION

Objective: employee satisfaction increases through acknowledgement and remuneration

Conditions of remuneration are provided in [Salary Rules of Tallinn University of Technology](#). Remuneration relates to the value of the position, qualification requirements, uninterrupted employment at TUT, and work performance. Regularly, as a joint effort with TUT Trade Union (at least once per year; recently 1.3.14) employee payments are reviewed, arising from an understanding that competitive remuneration is a key issue for attracting new young staff. Internal rules of remuneration, acknowledgement and motivation are updated according to state legislation and TUT Collective Agreement.

As compared to four Estonian universities in public law, average salaries of TUT academic staff by academic posts have remained the highest (Table 3).

Table 3 Average salary of academic staff in Estonian four larger universities under legal person in public law (2013)

Position	The average monthly salary (€)			
	TUT	UT	EULS ¹¹	TLU
Professor	3101	2707	2204	2409
Associate Professor	1850	1614	1341	1281
Lecturer	1216	1133	1039	1068
Assistant	1288	983	843	–
Teacher	1032	888	–	1052
Lead Research Scientist	2725	2829	–	1844
Senior Research Scientist	1757	1708	1414	1777
Research Scientist	1415	1305	1257	1566
Early Stage Researcher	953	985	850	1031
Average	1707	1530	–	1420

Source: Staff indicators of universities under legal person in public law collected by Association of Universities Estonia (AUE)

Under the TUT [Work Procedure Rules](#), a flexible work organisation has been established. Staff motivation is implemented in the R&D motivation system (TUT scientist of the year, TUT scientific article of the year, TUT young scientist of the year) and the best teaching members of the year elected in the faculties/institutions. The employees acknowledged are awarded the letter of appreciation and a monetary prize at the traditional ceremonial meeting devoted to the Anniversary of the Republic of Estonia. Individuals who have achieved distinguished research achievements recognised on an international scale are nominated yearly for National Science Prizes.

Every three years regular Work life quality surveys are implemented. As compared to 2010, satisfaction with remuneration and acknowledgement has grown (Table 4).

Table 4 Satisfaction with remuneration and acknowledgement (%)

Sub-factor	2010	2011	2014
Satisfaction with remuneration	63.4	60.9	65.5
Satisfaction with acknowledgement	64.2	66.1	65.0

Source: Work life quality surveys (2010, 2011, 2014)

Results of the survey were used in updating the Salary Rules (incl. implemented connection between the payment rate of academic staff and periodic performance review) and preparation of guidelines for evaluation of academic staff performance.

¹¹ Estonian University of Life Sciences

1.2.4 EMPLOYEE SATISFACTION WITH MANAGEMENT, WORK CONDITIONS, COMMUNICATION OF INFORMATION

Objective: employee satisfaction with work life quality is on an increase/stable

In the frame of Work life quality survey, data are collected by faculties/institutions. Results are analysed, introduced to membership (at information meetings and seminars, in the newspaper) and used for improvement activities in the area of personnel management (preparation of training plans, website developments, organisation of support services, improvement of work environment and information communication etc.). Though, in general, survey results demonstrate an increasing satisfaction, satisfaction with the management decreased slightly in 2014 (Table 5).

Table 5 Satisfaction with management, work environment and communication of information (%)

Sub-factor	2010	2011	2014
Satisfaction with management, incl.			
Satisfaction with institutional level management	85.1	86.8	84.3
Satisfaction with faculty/institution (institute, college) level management	80.7	83.0	80.0
Satisfaction with SU level management	81.5	81.7	79.4
Satisfaction with work environment, incl.			
Learning and teaching environment	88.8	88.8	93.3
Own office room/equipment	83.1	85.8	86.8
Welfare facilities and rooms	87.2	87.0	91.1
Satisfaction with communication of information, incl.			
Satisfaction with individual's work-related information	80.4	82.8	82.5
Satisfaction with internal institutional information	82.6	86.6	84.9

Source: Work life quality surveys 2010, 2011, 2014

1.2.5 EMPLOYEE INTERNATIONAL MOBILITY

Objective: international mobility indicator of academic staff is rising

TUT supports academic and support staff mobility and creates opportunities for self-development in universities and research institutions abroad. Arising from Procedure for Sabbatical Semester Application, teaching staff is eligible to spend one long-term period at a foreign university or R&D institution every five years. During the free semester, basic salary is maintained and substitute teaching in the SU is supported from centralised resources. However, the use of the sabbatical semester right is low. In recent years merely five teaching members on average have used the right annually¹².

Under the mobility programme Erasmus, from 2009/10 A/Y ~44 teaching members have delivered lectures in partner universities annually and ~44 teaching members/employees have participated in training programmes in foreign universities, organisations and enterprises annually¹³. TUT employees participate as foreign contract partners, in university networks and foreign organisation work and in international cooperation projects. Cooperation with [partner universities](#) abroad promotes TUT international cooperation in several [networks](#) mainly in the areas of engineering and technology (CESAER; SEFI; UNICA; Baltech; EUA etc.). International weeks are organised to university partners, IRO provides assistance to the faculties/institutions to set up contacts with foreign partners. Under different programmes (DoRa, Mobilitas, Doctoral Schools etc.), in the recent years TUT teaching members and doctoral students have taken longer-term self-development opportunities in universities abroad¹⁴.

To evaluate international mobility, as an indicator, TUT has implemented the number of secondment days in the calendar year per 1 academic staff member. According to TUT secondment register¹⁵, during the last five years, that indicator has grown from 6.7 days to 8.2 days. However, the indicator cannot give a clear picture of staff international mobility, the methodology would need improvement.

¹² Directives for sabbatical semester are accessible in the document register

¹³ Data available in IRO

¹⁴ Data available at the Unit of Foreign Financing

¹⁵ Data of the Institutes of Geology and Cybernetics not included

1.2.6 CONCEPTS OF ACADEMIC ETHICS

TUT Code of Academic Ethics defines the principles to be followed by the staff and the students. The Code conforms to the Charter of European Scientist, the Code of Ethics of Estonian Scientists, the Code of Conduct of Estonian Association of Engineers for Experts.

Academic Court has been formed to resolve any internal academic disputes. Composition of the Court is approved by the TUT Council for a three-year period. The duties of the Court are to promote instilling ethical values in academic staff and student conduct, incl. their communication; take a righteous decision concerning the dispute and if necessary, make a proposal to the Rector for prescribing a legal remedy.

Evaluations from student feedback and the number of debate settlements in the Academic Court are used to evaluate conformity to the principles of academic ethics. The Chair of the Academic Court reports to the TUT Council every three years.

Student evaluations concerning impartial approaches in the teaching activity are high, accounting for 4.4–4.5 on the 5-point scale.

STRENGTHS OF SUB-AREA 1.2

- Employee satisfaction with work environment and remuneration as well as availability of work-related information has increased.
- As compared to other universities, legal persons in public law, payments of TUT academic staff stay the highest.
- Proportion of under 50-year academic staff has grown.
- Proportion of foreign academic staff in academic staff has increased.

IMPROVEMENT ACTIVITIES IN SUB-AREA 1.2

- To conduct an in-depth analysis of performance indicators related to academic sustainability in faculties/institutions/SUs where relevant indicator(s) are significantly lower than institutional average and to implement measures to ensure academic sustainability in all areas.
- To introduce a consistent review of academic staff performance and associate it with remuneration.
- To contribute to creation of broader opportunities for self-development of academic staff, incl. a wider use of sabbatical-semester project by academic staff; to prepare long-term plans for the sabbatical-semester project.
- To improve employee opportunities for participation in international cooperation; to elaborate methodology for the evaluation of international mobility.

1.3 MANAGEMENT OF FINANCIAL RESOURCES AND INFRASTRUCTURE

1.3.1 MANAGEMENT OF FINANCIAL RESOURCES, INFRASTRUCTURE MANAGEMENT AND DEVELOPMENT

[TUT management of financial resources](#) is the area of responsibility under the Director for Finance, area-related operations performance is ensured by the Office of Economics and Finance (OEF). Legislation regulating financial activity is available in TUT document register and TUT [website](#).

TUT financial resource procurement and use through the institutional budget arises from institutional and SU purposes, strategies of SPs and national priorities. Short-term budgets (annual budget) and strategic budgets (long-term finance plans and prognoses) are prepared.

Budget is an instrument for institutional financial management, incl. SUs and projects. Conditions for the classification and preparation of the budget are set forth by the Director for Finance. Budget preparation, adoption, amendment and implementation is defined in the Budget Rules. Institutional and SU budgets, subject to discussion and coordination in the decision-making bodies or with area leaders/directors, are approved by the resolution of the TUT Council.

Budget performance, its effectiveness and fund-raising opportunities are analysed and the results are implemented, incl. in the preparation of amendments to the budget.

Accounting ensures implementation of the responsibility arising from law to provide up-to-date, essential, objective and comparable information concerning TUT's financial position, economic performance, cash flows and annual reporting of economic performance and other financial reporting, as prescribed in legislation. Main accounting reports ensure information provision for institutional activity analysis and planning. The accrual method of accounting and cash-based budgeting for a calendar year are applied.

Cash flow management ensures monetary resources for the implementation of short- and long-term objectives. As input information, cash flow management and planning derives from TUT budget, project accounting and other data. To ensure financial resources for activity, accounts receivable are analysed and reprisals are implemented for collection, seeking project pre-payments, if possible and loan resources based on TUT Council resolution, if necessary.

To ensure effective performance and realisation of objectives planned in the SP, sufficient resources are essential. Recent revenue base has shown a consistent increase (Figure 10).

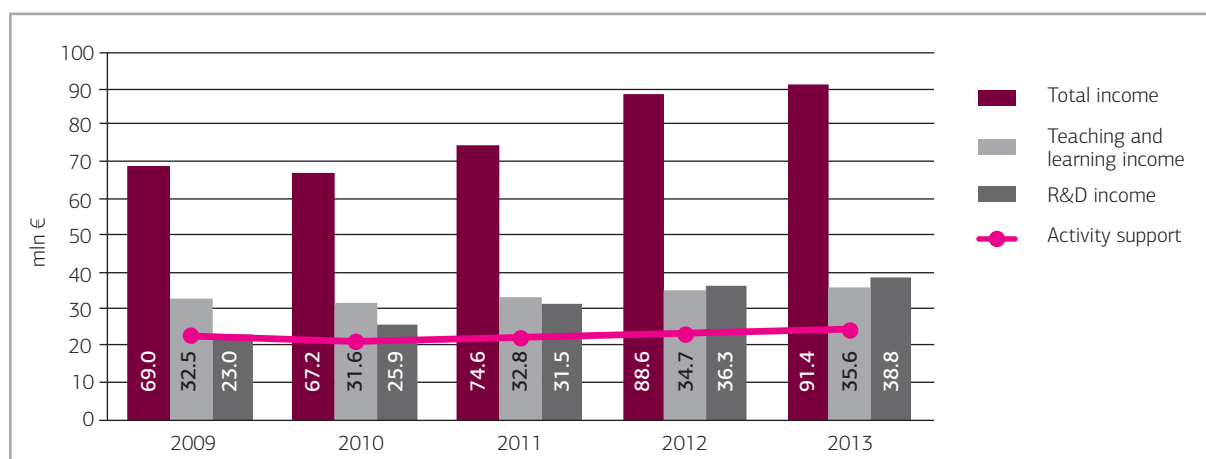


Figure 10 TUT distribution of income, mln €. Source: OEF

TUT budgetary resources are derived from state-commissioned and non-state commissioned sources. Distribution of budgetary resources in 2013 is shown in Figure 11.

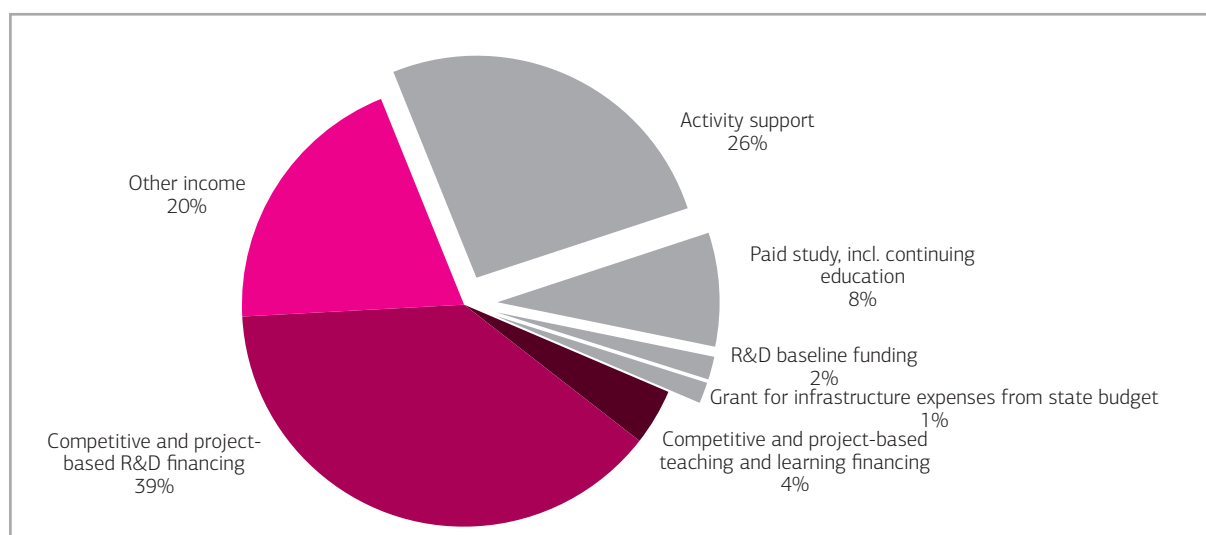


Figure 11 Proportions of budget 2013. Source: OEF

Monetary resources under TUT's capacity that can be reallocated to cover strategic objectives and operating costs are operating subsidies¹⁶, tuition fees, R&D baseline funding (BF) and allocations for infrastructure costs (~38% from TUT budget, grey area in Figure 11). Remaining resources are, in general, competition-based allocations intended for concrete project implementations.

¹⁶ Activity subsidies, financing from State budget through MER budget; earlier called as state-commissioned education (SCE)

Act on Universities: activity subsidy – subsidy for teaching and learning in the degree level higher education from the budget of the MER targeted to the creation of equal study opportunities to all talented and motivated students and to ensure monetary resources for the implementation of the mission, objectives and tasks of a higher educational institution.

Policies of TUT internal resource allocation defined in the Budget Rules provide for allocations for SUs (faculties/institutions/ASU) as well as for maintenance costs of immovables, capital budget, for the Student Body budget intended for student self-government performance. To ensure sustainability, stability, financial risk management and implementation of potential future responsibilities, TUT has pooled long-term reserves and funds (over one-year use). The Development Fund has been established to ensure implementation of SP objectives. In addition, institutional objectives are realised through the Rector's reserve fund.

Activity support is the largest financial resource, accounting for 26–33% of the income (Figure 11). Distribution of activity support is based on the institutional priorities and the objectives under the contract under public law. Allocations to the academic structure (faculties/institutions) from the activity support are implemented in conformity with TUT legislation on the basis of the algorithmic and expert method (taking into account institutional objectives, incl. purposes of doctoral studies and increase in the graduation efficiency). Distribution of activity support to SUs is within the area of responsibility of the dean.

BF resource is implemented to realise R&D strategic objectives, to finance institutions, faculties, institutional R&D projects, to form the R&D support fund. BF designations are regulated by the TUT Council regulation.

Analysis of expenses demonstrates a continuous rise in operating costs during the last years. Maintenance costs of immovables have increased considerably (mainly related to the realisation of the building programme). Maintenance costs peaked in 2012–2013, accounting for an increase of ~39%. Reasons lie in the opening of the free electricity market and the resulting higher prices as well as in the exploitation of new spaces. The operating costs were 13.2 mln € in 2009, at the same time 16.1 mln € in 2013. Main resources to cover operating costs (incl. operating costs of faculties/institutions) are allocated from the activity support (Figure 12). The reason is that a major portion of remaining income is project-based, targeted to implementation of a concrete activity. Thus as a rule, covering operating costs is ineligible. Resulting from that budget forming policy, it is essential to ensure sufficient resources for teaching and learning.

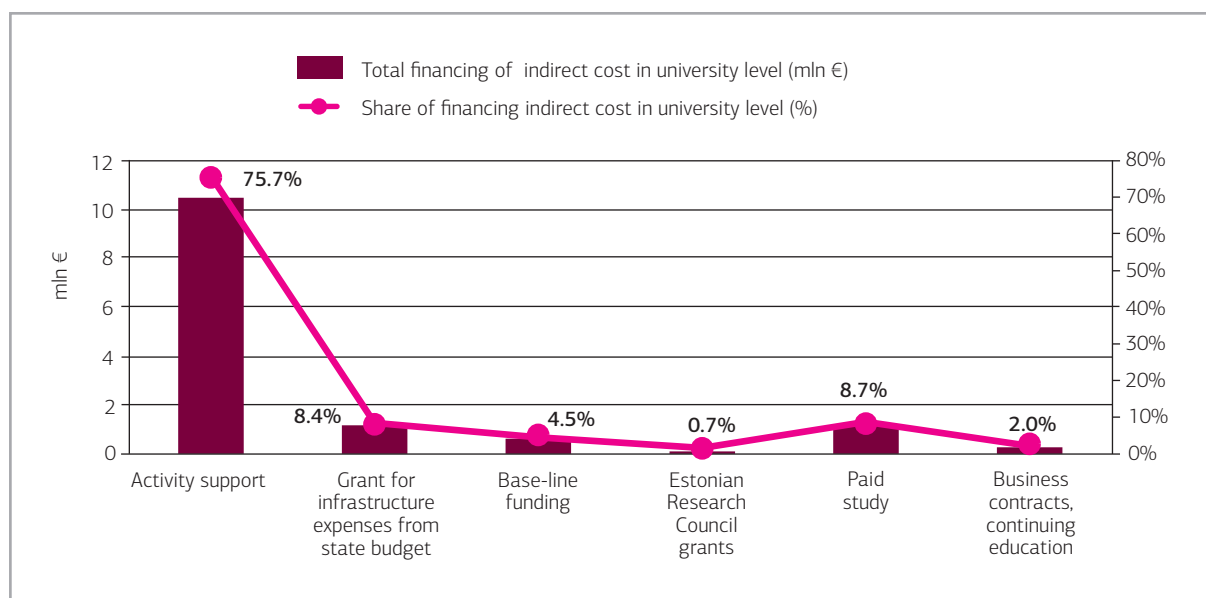
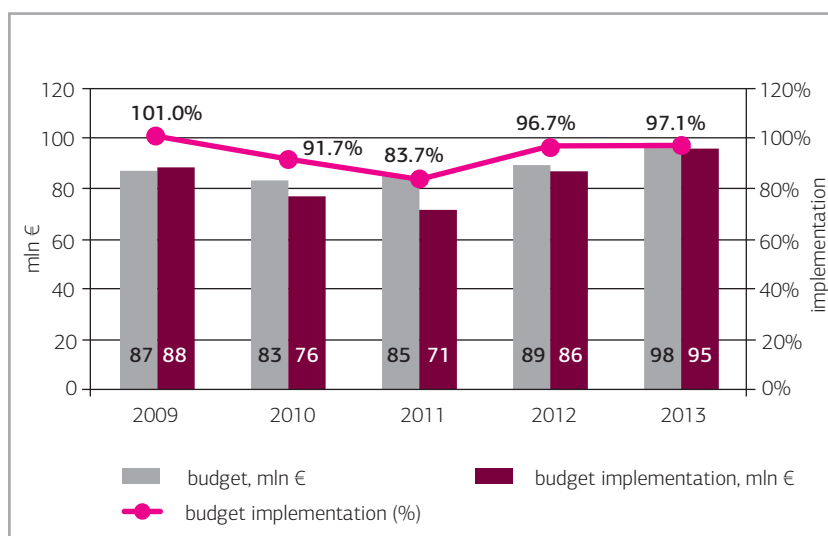


Figure 12 Sources covering TUT operational costs in 2012. Source: OEF

Liability for SU **budget** and/or project **budget performance** lies with the SU and/or project leader. To facilitate checking of budget performance, SU and project leaders/heads can access data on the budget and on budget performance on TUT Intranet. OEF function is to monitor regularly recovery of revenue and conformity of the expenses made to those of planned. If necessary, analysis results are communicated to directors of budget entities and the dean. Quarterly budget residue data are made available by OEF. If necessary, the Committee for Economic Affairs may review the condition of SU and project budget performance and the recovery of revenue. Preparation of the TUT report for budget performance is arranged by the Director for Finance while the report is approved by the TUT Council. Half-year budget performance is subject to review at the TUT Council session.



From 2011 TUT budget size has shown a growing trend (Figure 13). In comparison with budget performance in 2012, in 2013 budget performance increased ca 10%.

Figure 13 TUT budget and budget performance, mln €. Source: OEF

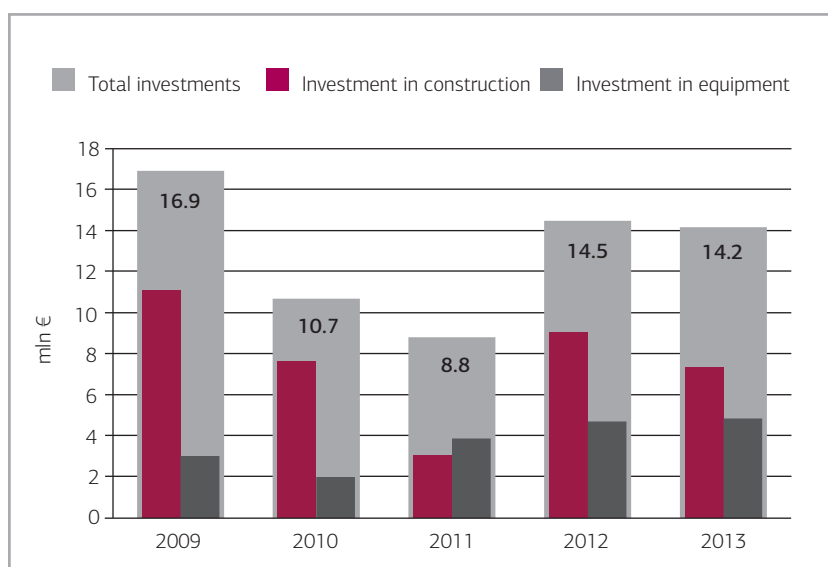
Main **accounting** function of SUs is performed by OEF, except for the Institutes of Geology and Cybernetics. Microsoft NAV is used for accounting, excl. the Institute of Cybernetics.

[TUT Consolidated Annual Report](#) includes financial performance indicators both for TUT and TUT sister enterprises NPO TUT Student Village, OÜ TUT Sport, NPO TUT Culture Centre, and NPO TUT Sports Club. TUT annual report of economic performance is approved by the TUT Council.

Infrastructure development is planned pursuant to the building investments plan of the SP and state priorities. Building investments are implemented as prescribed in the plans.

TUT is a legal owner of its immovables from 2000. As of 1 January 2014, TUT owns or has in possession a total of 54 immovables at 83.51 ha, 37 in immovable property ownership in the form of apartment ownership, and one movable property ownership – the research vessel „Salme“ used by the Marine System Institute. TUT owns 52 buildings at a total space of 150 101 m², 61% assigned for study and research purposes. From summer 2013, activity in Tallinn has been centralised (excl. Tallinn College and Estonian Maritime Academy) on the Mustamäe campus. In the Strategic Plan of the Mustamäe area TUT was acknowledged in the context of the capital city and as an international level research and education centre. Buildings completed in the 1960s and early 1970s have been recognised as 20th century Estonian architectural heritage under protection.

A majority of the resources were acquired from the EU structural fund's measure "Updating the infrastructure of study and work environment in R&D and higher education institutions". Both loans and own funds were made use of.



TUT's investments to building projects and equipment are substantial (Figure 14). Modern facilities for research, study and development work have been created. In 2000–2013 12 buildings were constructed (new study buildings, library, modern student hostels) and 15 units with a total space of 123 771 m² were reconstructed, building investments totalling at ~100 mln €.

Figure 14 Investments in construction and equipment, mln €. Source: OEF

Facilities management and maintenance of immovables, buildings and structures on the TUT campus is in charges of Facilities Management Office. According to their statutes, required maintenance of immovables by TUT institutions is an independent activity in the limits of their adopted budget.

Campus territory is 55.7 ha. In spring 2014 space for internal cleaning amounted to 85 600 m². Six cafeterias with 543 seating places are offered on the campus. Car park holds a total of 1297 places, incl. 317 underground, 244 at the disposal of the Student Village. Places for disabled parking are 26. Traffic management is subject to monitoring by the Tallinn Municipal Police.

Maintenance of utility systems is implemented on the basis of utility system maintenance contracts and by operation of electrical installation. TUT assets are protected by property insurance against vandalism, natural catastrophe and risks arising from university activity.

In 2013 TUT campus won the competition "Science in Education" organised on the initiative of the Club of the Rectors of Europe, composed of the rectors of universities from 30 countries. As distinguishing features, the committee pointed out novelty, innovation and strong ties with high-tech companies.

1.3.2 TUT INFORMATION SYSTEMS

IT infrastructure, information systems and services are developed pursuant to objectives set forth in the SP. Management and development/participation in the development of institutional information systems lies with the IT Office.

Information systems used:

- **Study information system (SIS)** contains all the information required by a student through the study period and an analysis module. Users: students, teaching staff, heads/leaders of academic SUs, dean's offices, support staff. It comprises continuing education system (CES) applicable in 2014. Interface: EHIS¹⁷, ERIS, AIS¹⁸, NAV, Web Desktop
- **Document management system (DMS)** is a DocLogix application adapted to Estonian market, which contains the register of contracts and secondment orders. Users: document management staff, administrative assistants/secretaries. Interface: NAV, open document register docs.ttu.ee
- **Accounting and personnel information system from Microsoft (NAV)**. Users: because of sensitive data composition applicable by selected specialists. Interface: SIS, DMS, TUT website, Web Desktop
- **Web Desktop environment** contains several smaller registers; developed from late 2012. Users: SU personnel, students. Best practices are selected from fast development methods, the process is based on the principles of Unified Process 9. Interface: SIS, NAV, DMS, Uni-ID
- For service (SaaS 4), the following services are mediated:
 - IT user self-service environment (ITRP);
 - MS Office 365 cloud solution
- In the frame of the object of the Estonian Research Infrastructures Roadmap "Estonian Scientific Computing Infrastructure", TUT scientific computing cluster was implemented.

1.3.3 PERSONNEL WORK CONDITIONS, STUDENTS' LEARNING AND RDC CONDITIONS

Infrastructure development has resulted in the study and work environment that conforms to modern requirements. All the buildings have central heating, ventilation, mostly also air conditioning. Lighting in rooms is in conformity with the norms established. Mustamäe campus holds a total of 97 classrooms/lecture rooms with 4034 seating places for teaching and learning activity. All the lecture rooms are equipped with boards and data projectors. 37 lecture rooms have sound systems for computer use. All the lecturer work places in lecture rooms are equipped with computers. TUT institutions too provide updated learning and work environment.

¹⁷ Estonian Education Information System

¹⁸ Admission Information System of Estonian Higher Education Institutions

TUT can boast of the library that is one of the most modern European [Scientific Libraries](#). The library functions as a public scientific library. University members can use required databases, e-journals and e-books for work and study purposes. Accessible Digital Collection contains all the doctoral theses defended from 2005, course books, R&D reports, materials relevant to history of Estonian engineering and technology etc. Via the TUT VPN portal, e-resources can be used around 24 hours. The library offers 500 computer workplaces, WiFi, 26 individual and 6 group work rooms, a computer classroom, scanning workplaces, copiers/printers, a training room, a cafe, and a bindery. For convenience, laptop users can borrow special accessories on spot. Special self-service automatic points serve for borrowing/returning books.

According to TUT employee satisfaction survey, satisfaction with the library has grown from 95.6% in 2010 to 96.1% in 2014. Resulting from feedback received, WiFi distribution was improved, each group work room was equipped with a terminal computer and flip-chart etc.

[Sports hall](#) offers opportunities for employees as well as students. Students can declare the subject of physical education similarly to other subjects in the curriculum.

An updated **Student House** at the disposal of students, equipped with modern apparatus, offers facilities for 11 active student organisations.

[Student accommodation](#) is managed by the TUT Student Village on the campus where the Academic Hostel is located. As of 31 December 2013, a total of 1972 accommodation places are offered. According to the surveys in 2011 and 2013, satisfaction in 5-point system was above 4. In the survey 2013, 72.1% of the responders evaluated Student Village activity and service by grade 5.

TUT has its kindergarten.

To ensure/improve the quality of work conditions and work environment, the work environment specialist is monitoring the conformity of work conditions with legislation. Employee satisfaction with the work environment has grown (see [p. 1.2.4, Table 5](#)).

Risk analysis has been conducted in all the work rooms. SU leader's/head's responsibility is to conduct yearly internal control of the work environment in the unit. Data are forwarded to the work environment specialist. Each SU, institution and college has a trained work environment representative. Work Environment Council, an important body in the area of work safety, records minutes of the meetings that are accessible to staff.

STERNGTHS OF THE SUB-AREA 1.3

- Long-term (3–4 year) financial planning has been implemented.
- Income has increased, monetary resources have been planned for SP realisation and reserves pooled for the implementation of possible receivables.
- Resource distribution takes into account national and institutional objectives; resource performance is planned and monitored.
- Building investment plans are fulfilled; activity in Tallinn is centralised to Mustamäe campus.
- Management and maintenance of immovables operate on a qualified level.
- Updated conditions are ensured for work, study as well as for accommodation, sports and for leisure.

IMPROVEMENT ACTIVITIES OF SUB-AREA 1.3

- To advance university financing and activity analysis; to find internal resources for reduction of expenses.
- To make recommendations for improvement of the state financing system to ensure sufficient size of financing in the university capacity.
- To update management accounting systems, apply transparency, promptness, diversity in accounting, and to ensure user suitable information for operative management decisions.
- To pursue practices leading to an approach in which SU budget formation is derived from SU action/operation plans.
- To improve organisation of project management for competent financial management of projects.



2 TEACHING AND LEARNING ACTIVITY

TUT teaching and learning activity is planned pursuant to [TUT Strategy for Provision of Education](#) that specifies TUT SP in the areas of degree level and continuing education and [Internationalisation and Innovation Strategy](#). Main TUT regulations in the area are: Academic Policies at TUT, Curriculum Statute, Rules for Student Admissions, Rules on the Termination of Studies, The Procedure and Terms and Conditions for the Recognition of Prior Learning, Regulations of Continuing Education, Development Programme of TUT Student Advisory System. Legislation concerning teaching and learning is accessible at TUT document register and on [TUT website](#).

Teaching and learning management lies with the Vice-Rector for Academic Affairs. Internationalisation of teaching and learning is coordinated by the Vice-Rector for Innovation and Internationalisation. Faculty level teaching and learning is under the control of the dean, directed by the faculty council, in colleges the director and the council, respectively; in an institute/study centre director/head of the SU. The dean and the director can delegate the function to the vice-dean/director for academic affairs. According to the area of responsibility, teaching and learning activities are coordinated and organised as follows: degree level studies – OAA, doctoral studies – Research Administration Office (RAO), continuing education – OU, and international activities – IRO.

On the institutional level, issues of teaching and learning are discussed and decisions prepared in the Committee for Academic Affairs at the TUT Council.

2.1 EFFECTIVENESS OF TEACHING AND LEARNING AND FORMATION OF STUDENT BODY

2.1.1 OBJECTIVES RELATED TO TEACHING AND LEARNING

Strategic goals, directions and expected results of teaching and learning are defined in the TUT SP and specified in the Strategy for Provision of Education. Consistent with the named, faculties/colleges set forth their objectives for the period in the SPs. According to the TUT SP and the Strategy, major objectives are as follows:

1. To increase TUT student share in overall Estonian student body and to compose a stronger student body with higher motivation.
2. To reduce student dropouts.
3. To raise graduation effectiveness¹⁹ and graduation efficiency²⁰ ([See 2.4.1, Figure 24](#)).
4. To enhance internationalisation: primarily in the master's and doctoral study by increasing the share of international students and international study programmes.
5. To achieve that education acquired is competitive on the labour market, quality of teaching and of subjects, study policies, counselling services follow a good standard.

From 2013 TUT's responsibility is to monitor implementation of the objectives agreed on in the contract under public law and in performance-based agreements.

To analyse developments and activity and performance indicators, Teaching and Learning Annual Activity Report for an A/Y is composed, which includes also activities planned for the next period. Review and possible amendments to activity directions result from the report, if necessary, recommendations are made for amendment of SP. To collect and compare activity and performance indicators, a SIS-based statistics system has been created.

From 2011/2012, at least once an academic year the Vice-Rector for Academic Affairs and OAA convene all faculties/colleges to discuss quality and performance of teaching and learning, review achieve-

¹⁹ Share of graduates with nominal period +1 year compared to enrolment

²⁰ Share of graduates with nominal period in overall graduates, according to contract under public law set forth for an A/Y

ments and agree on activities for the next period. Implementation of agreements is monitored, results of the analyses are used for improvement of study organisation. For instance, to seek increased graduation effectiveness, [Curriculum Statutes](#) introduced a rule in 2013 stating that low graduation effectiveness may serve as one of the grounds for closing admission on the curriculum.

RESULTS OF IMPLEMENTATION OF TEACHING AND LEARNING OBJECTIVES:

• Student admission

Objective 2015: TUT student share in Estonian student body is 25%

To ensure an optimal number of students, different events have been organised to high school students: information meetings, excursions, sample lectures, open door days. Cooperation agreements have been concluded with schools, TUT academic staff members are teaching subjects in partner schools. Basic school students are offered an opportunity to participate in the courses of OU Technology School and on completion of the courses learners gain advantages at admission to TUT.

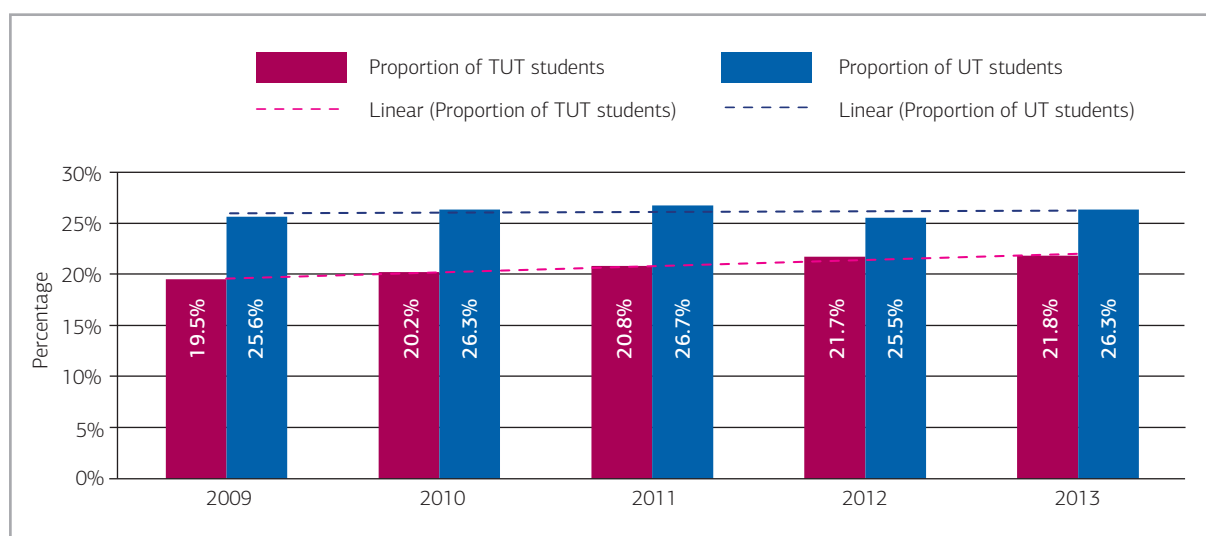


Figure 15 TUT and UT student proportion in Estonian Student Body (at 10 November).

Source: <http://www.haridussilm.ee/>

• Reduction of dropouts

Objective 2015: share of dropouts in overall student body decreases (from original level 13.6%)

Prevention of interruptions ([see p. 2.3.1](#)) is subject to yearly analysis and reviewing by OAA and faculties/colleges. So far the results are insufficient, the dropouts share is growing (Figure 16). A major reason is that a substantial number of newly admitted students do not commence their studies or interrupt them during the first semester.

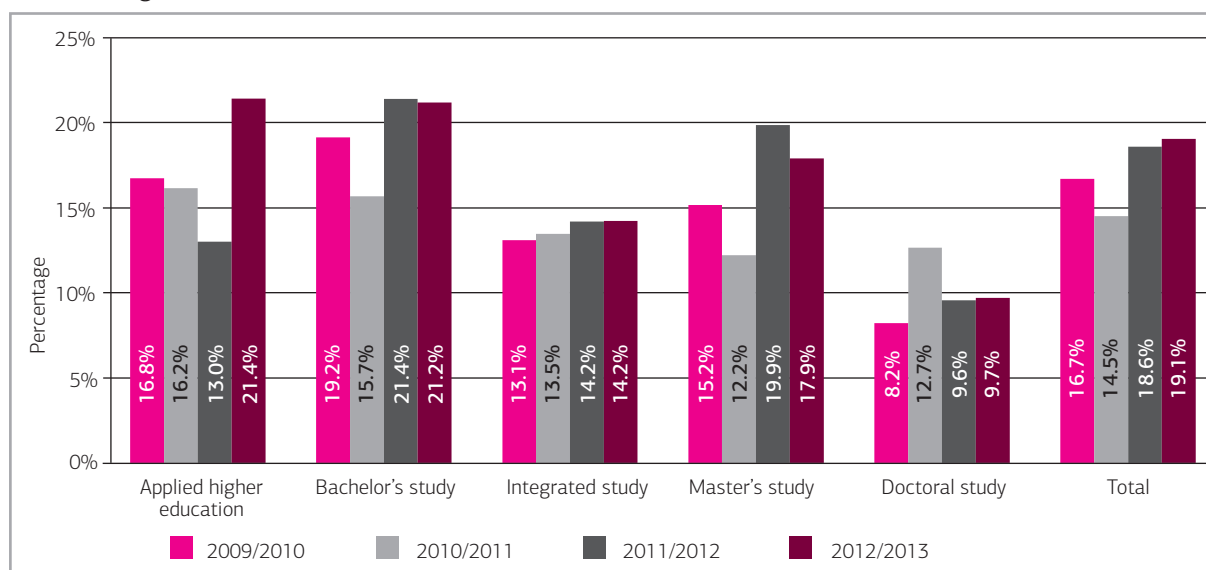


Figure 16 Proportion of student dropouts in the student body. Source: SIS

• Graduation effectiveness

Objective 2015: graduation effectiveness in all study cycles is 40%

To find the graduation effectiveness, the share of graduates with nominal period (+1 year) is compared with those enrolled by study cycles, i.e. how many students enrolled in a certain year complete their studies on the full-time basis. OAA analyses graduation effectiveness with faculties/colleges each year. Though diverse methods are implemented ([see 2.3.1](#)), to reach the objective in the forthcoming years is improbable (Figure 17).

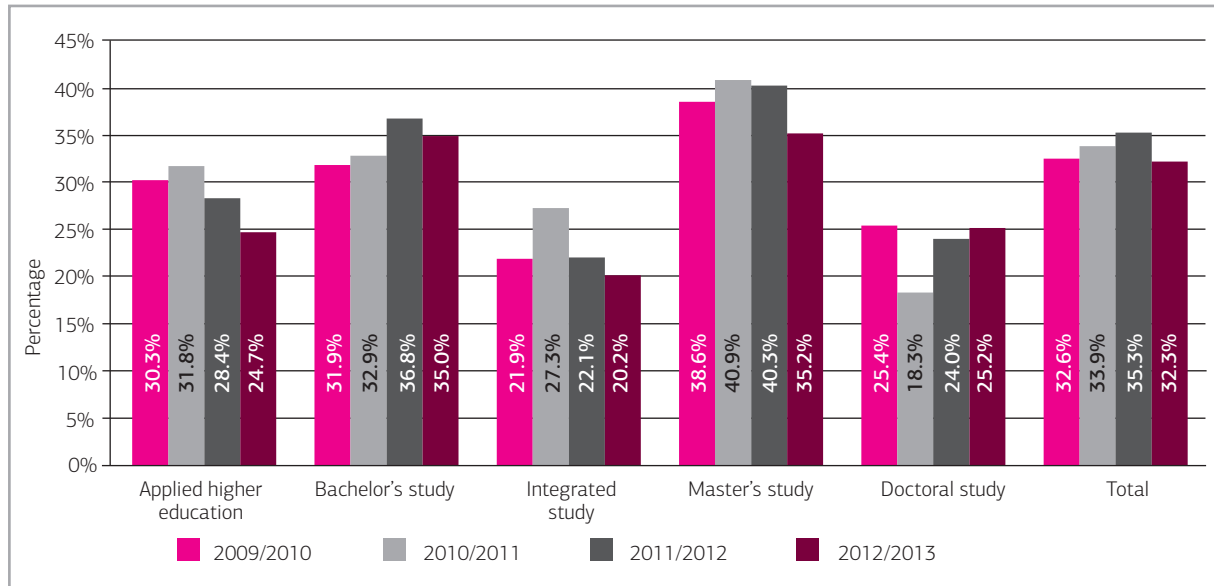


Figure 17 Graduation effectiveness by study levels. Source: SIS

• International student body

Objective 2015: share of international students on the master level grows to 8%, in the doctoral level – up to 10%

Consistent recruitment of international students is pursued through advertising TUT study opportunities by use of modern marketing mix ([see p. 1.1.6](#)). 1st and 2nd cycle international student marketing and admission is coordinated by IRO.

In the master's study, the objective of 8% set forth in the SP and the contract under public law has been achieved. In the doctoral study, the share reached is up to 8% (Figure 18).

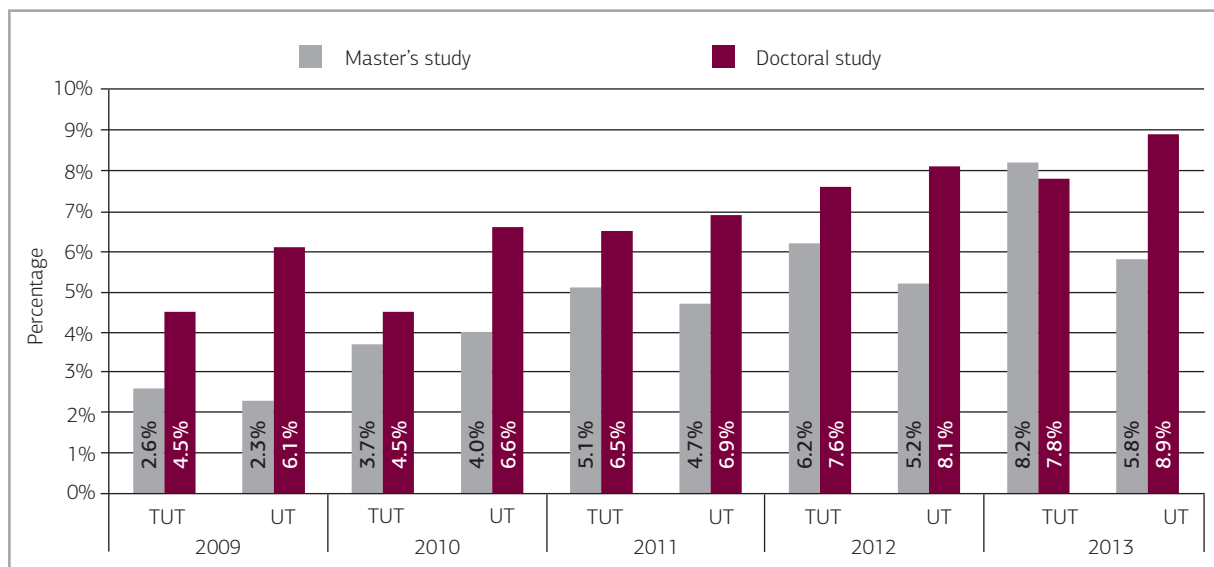


Figure 18 Proportion of international students in TUT and UT student body.
Source: SIS, www.haridussilm.ee

2.1.2 GRADUATE COMPETITIVENESS

To ensure graduates' competitiveness, focus is on enhancing the quality of education offered, incl. curriculum development consistent with the analyses of feedback from stakeholders and future prognoses, internationalisation, promoting student entrepreneurship and implementing knowledge and skills acquired to the work environment.

Curricula development is conducted in cooperation with all related stakeholders (students, alumni, employers, society), taking into account their expectations and needs. In addition to centralised institutional activities, active cooperation in the area of teaching and learning and curriculum development is fostered with employers, local and international professional societies on the SU level (e.g. with International Association of Law Schools). Feedback concerning conformity with labour market needs is acquired from regular surveys of alumni employment and employer satisfaction and employer evaluations concerning opening of new curricula. The results of the analyses are sent to SUs, published on the website and are used consistently in the curricula development and organisation of study.

Graduate competitiveness is also supported by granting an initial professional qualification level in the curricula, which complies with the professional standards approved by the Estonian Qualification Authority. From 2013 the initial professional qualification is granted to graduates in the area of building and construction. From 2014 master's programme graduates of mechanical engineering are granted the named qualification level.

For higher interdisciplinarity and internationalisation, cooperation in curricula development is fostered with SUs and other higher educational institutions. To pool best quality and as a result enhance graduate international competitiveness, inter-faculty, international and joint curricula are designed.

To raise graduate's entrepreneurial skills, a requirement was set forth to include an entrepreneurship course in all 1st and 2nd cycle curricula at the latest by 2015/16 A/Y. Special subjects with defined objectives and learning outcomes have been prepared. As of 2013/14, an entrepreneurship course has been introduced in 40.5% of the curricula.

All the curricula contain development of practical skills²¹. Internship coordinators are appointed to coordinate practical training in the work environment. With the coordinator's assistance, a student's duty is to find an internship place. OAA Career and Counselling Office, too, mediates internship places. IBC concludes frame contracts with larger enterprises that incorporate internships. Inter-faculty business projects are offered also by the Mektory environment. Standard institutional instructions of practice have been approved. An internal audit was conducted in 2010 to streamline the practice system and to map the duties of internship coordinators; the results have been used to improve organisation of internship. Still, work is ahead to achieve well-focused performance, organisation and feedback. To improve cooperation between TUT and businesses, amendments and extension to the feedback system are planned.

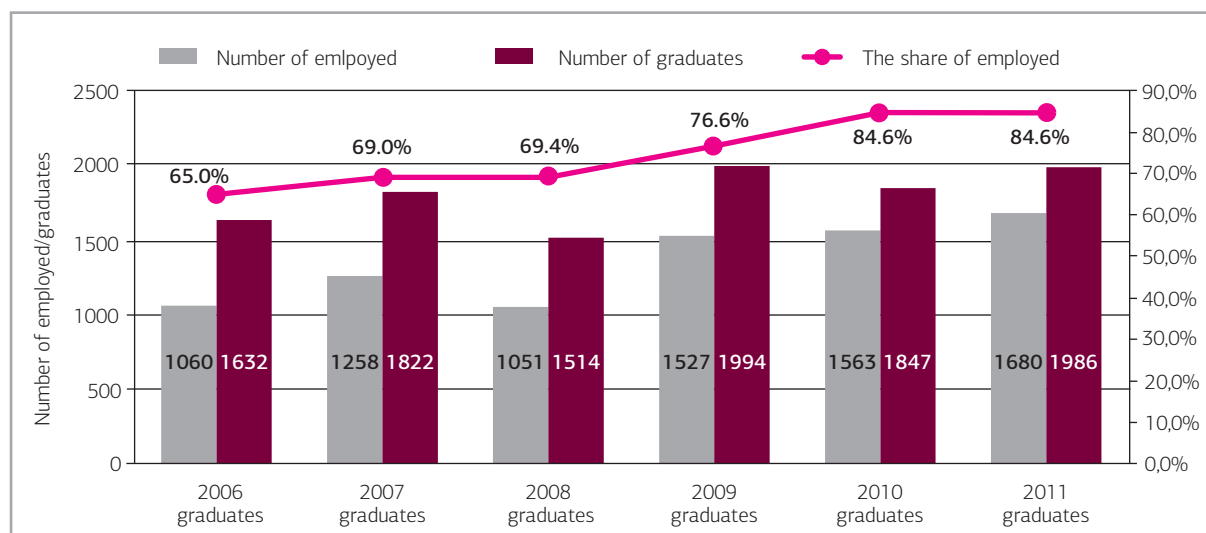


Figure 19 2006–2011 graduates' employment in 2012. Source: Statistics Estonia

²¹ study practice, practice in the work environment (internships) or projects

According to the employment survey 2013, 85.6% of 2010–2011 graduates are employed (2008 survey showed 81%). Majority of alumni hold top specialist (56%) or middle level specialist (21%) positions, mainly in private companies (72%, in 2008 – 68%) and in the public sector (23%, in 2008 – 25%), in own companies – ~4% of the respondents (2008 – 3%).

Majority (86%) of alumni employments are basically or partially related to their specialisation. According to Statistics Estonia, as of 2012, ~75% of 2006–2011 TUT graduates (excl. those enrolled and on parent leave) are employed, unemployment rate is ~6%. Rate of graduate employment varies, resulting from the graduation year (Figure 19).

Regarding to work relation, alumni are successful, satisfied with their work and competitive. According to alumni opinion, their specialised knowledge/skills acquired are consistent with the labour market needs. Master's study graduates prove most competitive.

2.1.3 STUDENT PLACE PLANNING

Objective: stable student number

As student admission into the 1st cycle is decreasing, a balancing policy that promotes admission to master's and doctoral study and international study in all higher education cycles is implemented.

Planning of student places takes into account society's needs in strategic areas for critical mass of graduates, at the same time regarding TUT's teaching potentials. Up to 2012 society's needs were derived from state-commissioned admission; since 2013 from the contract under public law and performance agreements between TUT and MER. At yearly meetings of faculty/college representatives, TUT's admission potentials and opportunities are reviewed. As 75% of TUT programmes and ~62% of students are enrolled in the STEM area, priority in student place planning is given to that broader area. Different area-related studies (e.g. IT sector surveys concerning labour market needs) and employers' expectations (e.g. biomedical technology – from the Ministry of Social Affairs) are taken into account in student place planning; however, these surveys are still insufficient. Quota on admission are reviewed at the meeting of the Committee for Academic Affairs and approved at the TUT Council.

Student place planning considers diversity in student candidate backgrounds. To extend study opportunities for working students, study programmes designated for purely part-time load have been created; many programmes offer both full-time and distance study. To increase the share of international students, their study places are planned separate. Special provisions are made for disabled, candidates from children's homes and those with remarkable sports achievements.

2.1.4 ADMISSION REQUIREMENTS

Student admission is conducted according to [Rules for Student Admissions](#) and other legislation that define the requirements, thresholds and admission quota. Information on admission is well accessible on TUT website. International study opportunities and conditions for admission are available on [TUT website in English](#).

The purpose set forth is to increase the number of master's and doctoral student admission, incl. international students, talented and motivated students and to provide access to higher education to individuals with special needs. To recruit more talented and motivated students, admission to science, engineering, manufacturing and construction areas is competition-free or complimentary points are given to school leavers with a medal, to participants from international subject olympiads and to candidates within the first five at the national science olympiads or olympiads related to their speciality.

Student candidates are offered the following: pre-university courses targeted to state examinations/university entrance tests; entrance tests to candidates with no pass at state examinations or who wish to improve their result in mathematics; an opportunity to start their studies in Russian in the bachelor's and applied higher education cycles in engineering and technology broader areas; use of APEL²² opportunities.

To help candidates to choose a suitable programme, student candidates can use [TUT career counselling](#) services.

²² Accreditation of prior and experiential learning

New student admission process is operated through the national admission information system that ensures transparency. Student admission from Estonia (excl. doctoral study) is coordinated by OAA, international student admission – by IRO. Doctoral student admission is coordinated by RAO. Information is available on [TUT websites/\(Eng.\)](#).

The following is evaluated on the basis of admission statistics: the rate of student place fulfilment, share of students enrolled with higher state examination results, share/number of international students and accordingly the role of competition conditions and thresholds is assessed against the admission objectives set forth. In 2013 the share of newly admitted students whose results in mathematics were 80 points or more increased to 35% of the overall admission (in 2011 – 30%).

2.1.5 STUDY OPPORTUNITIES FOR STUDENTS WITH SPECIAL NEEDS

Planning and organisation of the study and learning process takes into account special needs of students and the study environment, education technology, study materials and other items are adapted to their needs.

Access to higher education for students with special needs means that their welfare is monitored from their admission. In 2010 a counsellor for students and student candidates with special needs was employed.

Study environment is improved consistent with the feedback from students with special needs and universal design principles: suitability of the study environment to all students. In the recent years access to lecture rooms has been remodelled, special study and sports equipment has been acquired, from 2013 sub-titles for e-courses are being prepared. The following special facilities are available for persons with physical disability: entrances from the main doors of all study buildings have automatic doors installed; invalid hoists and general-purpose lifts in the buildings.

The library has created conditions for persons with special needs: moving in the wheelchair is easy; visually impaired readers are provided a reading TV; a special point letter printer and an audio output scanning device are available.

From 2009 state scholarships are offered to students with special needs.

From 2013 an annual allowance from the TUT Development Foundation is provided for study aid purchase and improvement of the environment to students with special needs.

STRENGTHS OF SUB-AREA 2.1

- Internationalisation of teaching and learning activity has been successful, objectives set forth in the SP and strategies have been mainly fulfilled.
- Alumni are satisfied with their jobs, appreciate specialised knowledge and skills acquired and consider themselves competitive on the labour market.
- TUT is recognised as an institution that cares for students with special needs. In 2012 TUT was acknowledged by the TUT Estonian Society of Physically Disabled Persons “Accomplishment 2011”.
- Availability of comparative data concerning teaching and learning has improved considerably, SIS statistics module facilitates acquisition of main performance indicators on the institutional as well as on the faculty/college level and by the curricula/programme required for decision-making.
- A new environment, Mektory, has been established to conduct inter-faculty business projects.
- TUT student share in Estonian student body is on an increase.

IMPROVEMENT ACTIVITIES IN SUB-AREA 2.1

- To enhance graduation effectiveness and reduce student dropouts by analysing the impact of support activities and introducing additional activities, if necessary.
- To improve student place planning, taking into account balanced approaches to the development needs of the labour market and student interests.
- To improve the efficiency of the internship system, its organisation and purposeful performance.

2.2 CURRICULUM DEVELOPMENT

2.2.1 OPENING OF CURRICULA

Curriculum development is based on the needs of stakeholders (students, employers, alumni) and on the future prognoses of broader areas. Interdisciplinarity, internationalisation and economical use of resources are considered essential in curriculum development. To ensure effectiveness and economics of curricula, optimisation of curricula and main specialities was initiated in 2012.

A policy of creating inter-faculty (Integrated Engineering, Business information Technology) and/or joint curricula (Design and Engineering, Cyber Security etc.) with other higher educational institutions is favoured to pool best quality and as a result improve international competitiveness of graduates. From 2013 TUT is operating 8 active joint curricula, an indicator of the most successful university in Estonia. Share of international curricula amounts to 34% of active TUT curricula.

New study programmes are initiated by academic SUs consistent with input from stakeholders' feedback, activity area SPs/surveys, employers' recommendations etc. To ensure up-to-dateness of new curricula and compliance with TUT's and national strategies and avoid duplication, from 2012 the evaluation of pre-applications for the opening of a new curriculum by the Committee of Preliminary Assessment takes place. The aim is to evaluate needs for opening a curriculum, a target group and labour market needs, cooperation to be planned within the university, competitive advantages of the new curriculum over the existing, potential labour market output etc. New curricula are subject to expert assessment by employers before approval at the TUT Council.

2.2.2 DEVELOPMENT ACTIVITIES OF CURRICULA

Management, development and administration of curricula functions at the faculty/college level. On the institutional level, the [Curriculum Statute](#) defines the structure of curricula, general organisation and mode of presentation, lists of compulsory all-university subjects and recommended volumes. To ensure better consistency of the curricula with stakeholders' expectations, the Statutes are updated, if necessary. For instance, in 2012 supplementary opportunities were introduced in the Statutes to add a minor specialities, form sub-modules, capacity of elective subjects was increased targeted to enhance attractiveness and flexibility of curricula and to create supplementary opportunities for students.

Main working bodies involved in curriculum development are Curriculum Committees (CC) of faculties/colleges and curriculum heads. CCs incorporate also student and employer representatives. Broader areas and duties of CCs and curriculum heads are defined in Rules of Procedure of CC. Functions of CCs include preparation, management, development, popularisation, closing of curricula and coordination of academic activities. In addition, CCs deal with stakeholders' feedback, results of different internal and external evaluations and are entitled to make recommendations and development proposals, based on these. In addition to centrally collected stakeholders' feedback, feedback from Student Education Quality Working Groups (EQW) is taken into account. Yearly, CCs are reporting to the Vice-Rector for Academic Affairs and to the Committee for Academic Affairs at the TUT Council.

To improve cooperation and exchange of experience, a network of curriculum heads was formed in 2011.

In 2009–2011 TUT successfully passed transitional evaluation of study programme groups. Instruction in all the bachelor's, applied higher education, master's and engineering curricula open for admission were granted unlimited validity. As a result of the transitional evaluation of doctoral programmes, unlimited validity was granted to 8 curricula, 2 curricula were given the right of fixed term teaching validity. In 2014 both of the fixed term validity curricula passed re-evaluation and were granted unlimited validity. The results of external evaluations are taken into account in curriculum development. Arising from the results of the re-evaluation and the modified external evaluation conditions, a new self-evaluation form for curricula was prepared jointly with the quality working group of teaching and learning.

2.2.3 ALUMNI AND EMPLOYER SATISFACTION WITH GRADUATES' QUALITY

An important function of TUT is to analyse employer needs and graduate employment in order to provide society the required amount of internationally competitive specialists.

Feedback from **alumni** is collected centrally through surveys since 2000. The aim is to review graduates' post-university activities and collect evaluations concerning their competitiveness and their capacity in their function (see also 2.1.2). Surveys are targeted to graduates who completed their studies 1–2 years ago. As the number of international alumni has grown, more attention should be paid to feedback from them.

Evaluations concerning **employer** satisfaction are collected centrally from 2008. The aim is to evaluate the quality of study programmes and graduates from the employers' position as well as its consistency with their expectations.

Graduate satisfaction with studies has been surveyed from 2012. Feedback is collected from students who have completed their studies and are about to graduate. The aim is to evaluate satisfaction with study quality based on different aspects: competence of teaching staff, teaching methods, objectivity/ clarity of assessment criteria, internship content, supervision of graduation theses etc.

Active communication to collect direct feedback is happening also on the faculty/college level.

Results from surveys are used in the evaluation of performance of curricula objectives and curriculum development. The results provide information for current and future students for study and career choices. The analysis of feedback, implementation of the results and increase in the number of respondents are discussed since 2013 at regular meetings of the Vice-Rector for Academic Affairs, Office of Academic Affairs and faculties/colleges. Results of feedback are introduced at so-called "institutional quality Thursdays", reports are available on the TUT Intranet and website.

The activity rate of alumni and employers' responses has been rather low, which hampers interpretation of the results. Participation in survey 2012 was 9.1% of graduates 2010–2011. The activity rate of graduates' responses in 2012 was 30%, which may provide satisfactory information.

MAIN RESULTS OF STRATEGY FOR PROVISION OF EDUCATION PERFORMANCE:

- **Objective 2015:** graduate evaluation of competitiveness and capacity in their function ≥ 4.00

Satisfaction with competitiveness is approximately within the objective set forth, exceeding it in most objectives. Only evaluations concerning study programme consistency with developments in the labour market are lower, which indicates a need for a more flexible attitude to curriculum development (Figure 20).

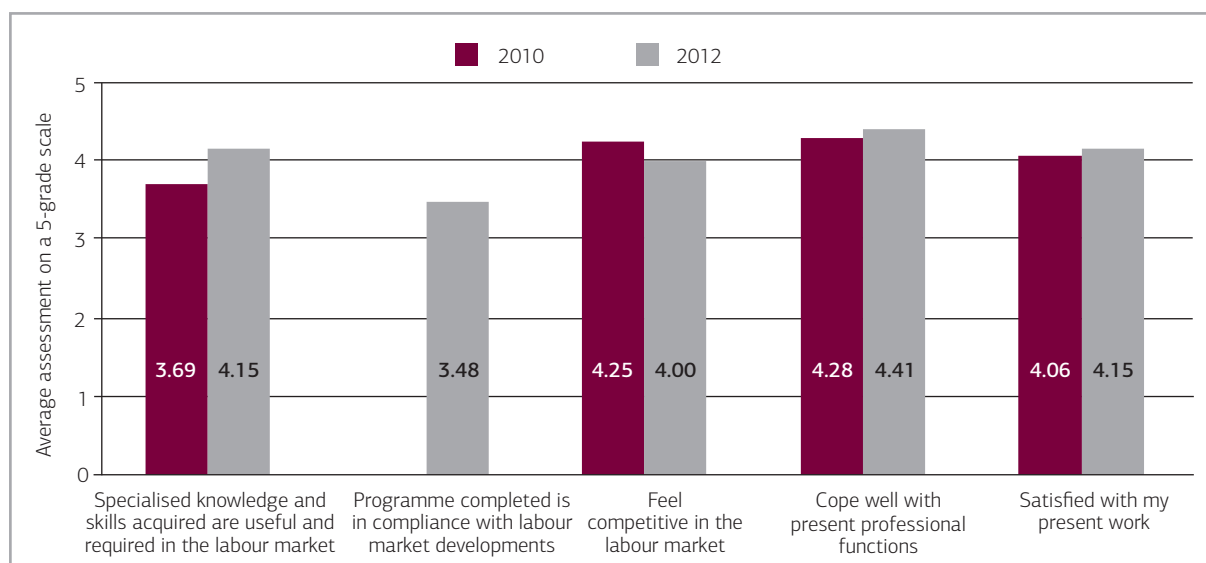
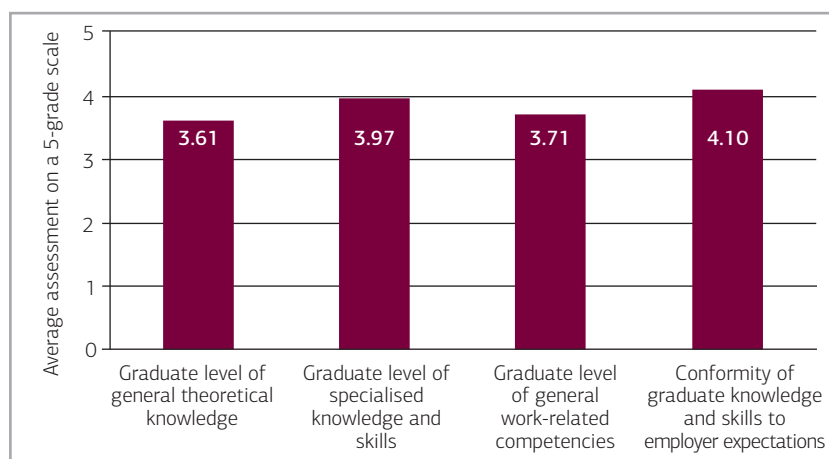


Figure 20 Results of alumni survey

- **Objective 2015:** employer satisfaction with graduate quality ≥ 4.00



Regarding to most of the objectives, employer satisfaction remains still lower than desired (Figure 21).

Study programme amendments made in the last years have taken into account employers' expectations, which is to be reflected in employers' feedback for the nearest future.

Figure 21 Results of employer survey, 2013

- **Objective 2015:** graduates' satisfaction with TUT studies ≥ 4.00

Graduate feedback reveals relatively stable satisfaction indicators (Figure 22). Evaluations concerning conformity of the study programme with labour market developments are lower. Along with curricula updating, actual results should be revealed in the next survey. The objective is achievable by 2015. The impact of the recent study programme amendments should be reflected in the nearest future in the graduate feedback.

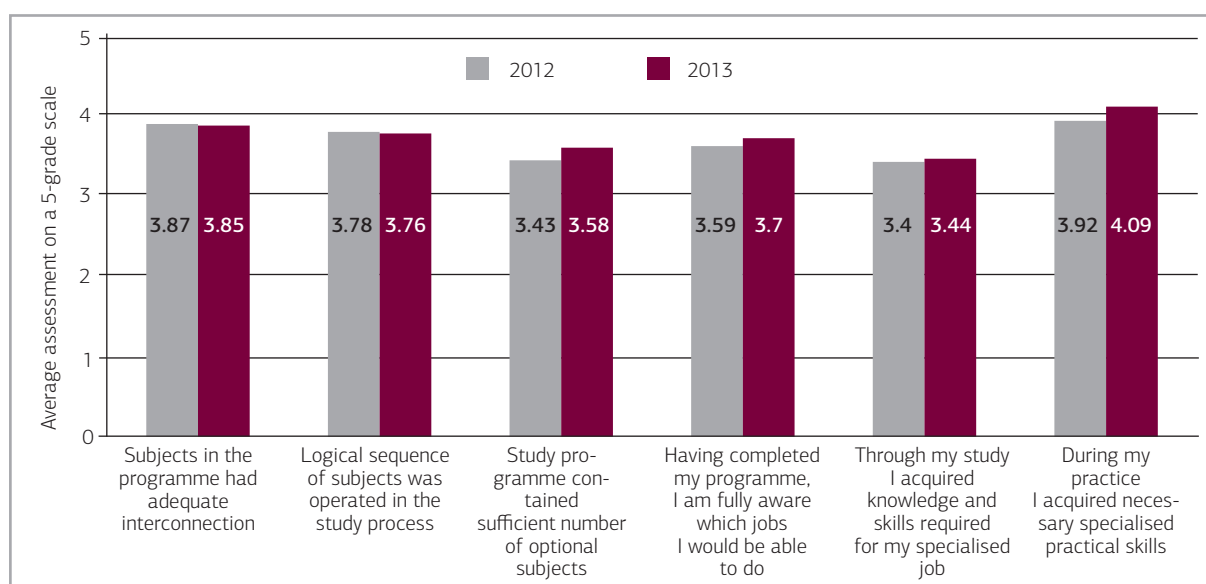


Figure 22 Results of graduate feedback survey

STRENGTHS OF SUB-AREA 2.2

- Curriculum opening and development process is regulated unambiguously, all stakeholders are involved.
- Transitional evaluation of study programme groups was successful.
- Internationalisation of teaching and learning has been successful; the share of international curricula is 34% of all operating study programmes.
- To pool best quality and improve graduate competitiveness, 8 joint curricula have been implemented, which is the best result among Estonian universities.

IMPROVEMENT ACTIVITIES OF SUB-AREA 2.2

- To continue optimisation of curricula and major specific fields.
- To develop the feedback system for more efficient implementation of feedback from different stakeholders, to pay more attention to collecting feedback from alumni abroad, to develop a web-based feedback system application for promoting cooperation between TUT and internship enterprises.

- To apply more flexible approaches to amendments/substitution of curricula or its single components therein arising from society needs.

2.3 STUDENT ACADEMIC PROGRESS AND ASSESSMENT

2.3.1 STUDENT ACADEMIC PROGRESS IS MONITORED AND SUPPORTED

Objective: to reduce student dropouts, enhance graduation efficiency and to offer in-depth study opportunities for talented students

Monitoring of student academic progress is regular and systematic and is consistent with the principles of the Academic Policies. Direct monitoring is implemented first on the faculty/college level: student attendance, academic progress in subjects, individual counselling and cooperation with teaching staff; the function of student group representative has been introduced etc. Yearly evaluations are conducted to evaluate doctoral students' progress. Performance of the activities to support student progress is analysed regularly (twice a year) at the meetings of the Vice-Rector for Academic Affairs, Office of Academic Affairs and faculties/colleges.

To ease freshmen's adaptation, the following post-admission activities are implemented:

1. the orientation week for freshmen, including introduction of university rules, opportunities and support services to ease adaptation to the university environment, contribute to creation of 'a feeling as a group';
2. all freshmen can take remedial courses of mathematics, physics to ensure an even-level academic preparation and progress;
3. e-course of self-management in the first semester (from 2007/2008 A/Y);
4. from the orientation week freshmen can use tutor help (student-to-student counselling); tutor training is on a regular basis.

To avoid dropouts, individual and differentiated (master's, doctoral, international students, students with special needs, potential dropout students etc.) counselling is offered. From 2012 performance in all subjects is monitored. Explanations about high dropout level subjects and related teaching staff is sent to the OAA and the Vice-Rector for Academic Affairs by the head of the department who is engaging the teaching member.

To support talented students, in-depth learning approaches are offered by all faculties/colleges. Information is mapped and publicised on TUT website. Students are participating in various professional societies that provide complimentary opportunities for professional involvement during university study. In addition, Mektory offers interdisciplinary product development projects to students as well as workshop use.

Reasons of dropouts are subject to regular analysis (Figure 23). Results are used when planning activities for reduction of dropouts. Very high rate of dropouts on their own initiative or non-attendance reveals a need for strenuous efforts towards formation of more motivated student body.

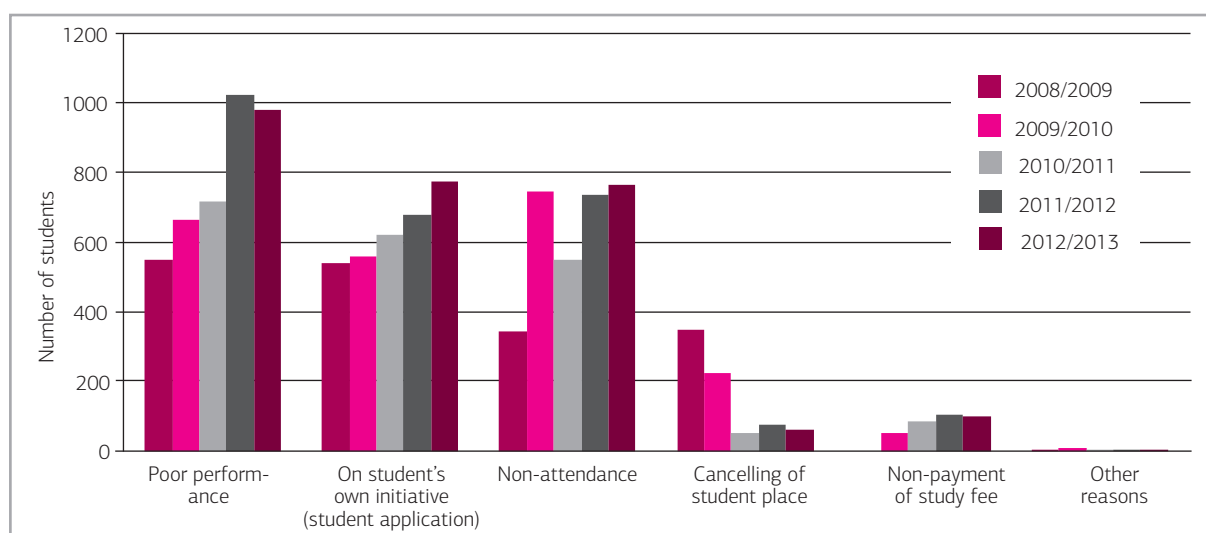


Figure 23 Reasons for study dropouts. Source: SIS

Arising from feedback collected, from the spring semester 2014, the study process is being monitored (focus on graduate thesis writing, supervising, defence).

2.3.2 STUDENT ASSESSMENT

TUT implements outcome-based assessment: requirements for assessment, examinations/non-graded assessment are defined in the [Academic Policies](#). Methods and criteria of assessment and explanations for pre-requisites and formation of final grade are available in SIS subject webpage. Information about assessment is available to students before the start of studies and remains unchanged during the study semester. Conditions of completion of studies are defined in the [Rules on the Termination of Studies](#). In case of discord, a student may place an appeal.

Institutional and faculty/college based training was organised on the transfer to outcome-based assessment in 2007–2010. Teaching staff is provided with a guide containing explanations and examples in ECTS Manual.

Assessment criteria are monitored by OAA. In 2013 a SIS-based detailed analysis was started embracing assessment methods and criteria of all the subjects taught in order to check availability of full information required for assessment. On the basis of the analysis, teaching staff can change or improve assessment criteria. From 2013, the issue concerning consistency of assessment criteria and assessment was included in the student feedback survey.

2.3.3 ACCREDITATION OF PRIOR AND EXPERIENTIAL LEARNING SYSTEM (APEL)

APEL performance process is regulated by the [Procedure and Terms and Conditions for the Recognition of Prior Learning](#).

[TUT APEL website](#) contains instructions explaining the process, application forms as well as contacts, incl. in English and Russian. Information brochures in Estonian, English and Russian are available in OAA, faculties/colleges and OU. Staff of each faculty/college comprises at least one APEL advisor.

APEL application can be submitted in SIS. Applications are reviewed by curriculum heads and teaching staff, in cases of larger capacity, applications will be evaluated by SPC, to ensure substance quality of evaluation and consistency with APEL principles. Regular seminars and training are organised to applicants, advisors and assessors.

TUT APEL Advisory Committee is composed of representatives of each faculty/college, students, OU and OAA. The function of the Advisory Committee is to ensure an even level in APEL implementation at TUT.

In 2009 collection of feedback from the process parties (applicants, advisors, assessors) was introduced. Results are implemented in the improvements and further activities (SIS applications, seminar topics etc.).

TUT Faculties of Social Sciences, Mechanical Engineering, School of Economics and Business Administration have passed APEL external evaluation to analyse APEL process performance in the faculties and acquire feedback from external experts. In 2013 APEL applications were monitored in all the faculties to review the implementation of APEL principles in the evaluation of applications. External evaluations and monitoring pointed out insufficient feedback from assessors to the applicants and some ambiguity in the roles and responsibilities of different parties in the process. As a result, parties' roles and responsibilities were defined and corrections were introduced to the process implementation. Arising from the feedback, APEL application forms were made more user-friendly.

STRENGTHS OF SUB-AREA 2.3

- Student academic progress is supported, both remedial and in-depth study opportunities have been implemented.
- Assessment-based training is organised, supported by different instructions, incl. ECTS Manual; daily support services are offered.
- APEL process is featured by good performance and transparency.

IMPROVEMENT ACTIVITIES OF SUB-PROCESS 2.3

- To develop a monitoring system to prevent dropouts and to improve monitoring of students' academic progress through the whole study period.
- To implement supplementary activities for reduction of dropouts.
- To implement the results acquired from feedback and analyses in a more systematic manner and thus ensure consistency of assessment and assessment criteria and support acquisition of learning outcomes.

2.4 STUDY SUPPORT PROCESSES

2.4.1 ORGANISATION OF STUDIES

To ensure completion of studies within the nominal period, as an inseparable part, each curriculum has been supplied with a recommended plan for completion of studies – a standard study plan. Following the standard study plan facilitates an even distribution of study load (30 credits per semester) and a logical sequence of subjects. In addition to subjects required in the curriculum, students have the right to choose and include all subjects taught at TUT into their individual study plan at an unlimited capacity. Timetable preparation is centralised, based on SIS standard study plans and proposals from the departments. Teaching staff and student preferences and purposeful time use are taken into account.

A student may complete some of external study²³ in other higher education institution in line with study at TUT or at the semesters specially planned. Accreditation of subjects passed during study abroad is provided in the Academic Policies, Study Procedure for Visiting Students, and in APEL.

According to the contract under public law, TUT is obliged to enhance efficiency of graduation performance as compared to 2012. Organisation of studies has ensured relatively stable graduation efficiency (Figure 24). Analyses and an activity plan are under way on all study cycles to increase graduation at a nominal period.

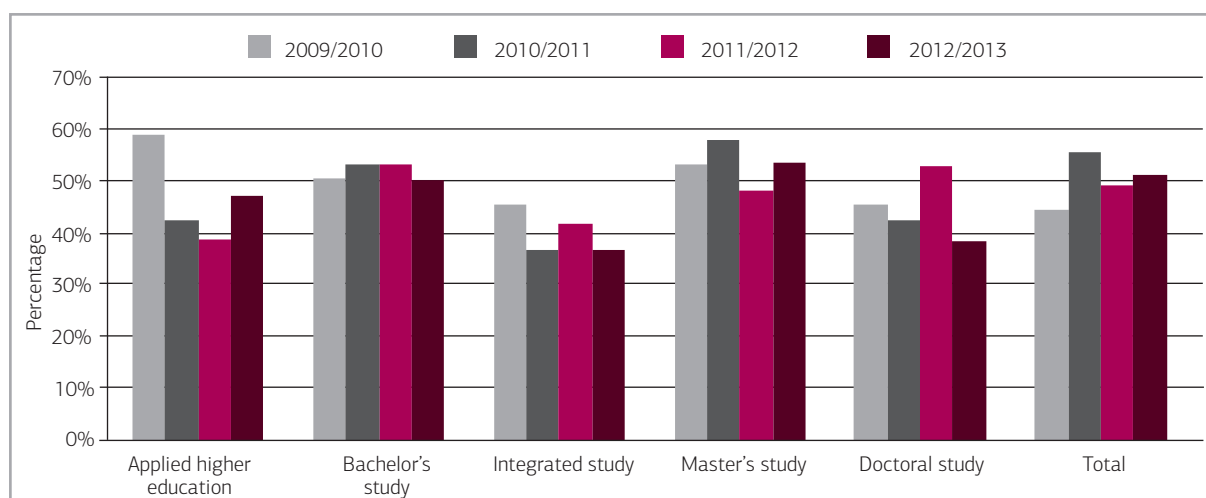


Figure 24 Graduation efficiency²⁴. Source: SIS.

2.4.2 ACADEMIC AND CAREER COUNSELLING

Planning and development of counselling activities is derived from TUT SP, TUT's Strategy for Provision of Education and Development Programme of TUT Student Counselling System. Information about student counselling services is accessible on [TUT website](#).

The counselling system comprises academic counselling, career counselling, welfare facilities and health affairs etc. The main aim is to ensure support and availability of counselling to all students, incl. international students. Activities planned to implement the objectives are defined in the implementation plan of the Development Programme. Programme performance is subject to yearly checking and the objectives set forth are taken into account in SU operation/action plans. Programme preparation, implementation, monitoring and amendments, if necessary, are conducted in cooperation with different

²³ External study is TUT student's temporary study/internship outside Estonia or in some other higher educational institution in Estonia

²⁴ Share of graduates with nominal period in overall graduates, according to contract under public law set forth for an A/Y.

parties, incl. the Student Union. Performance of objectives and service quality as well as availability is evaluated by graduate, counselling and freshmen satisfaction surveys.

Counselling in the following forms is coordinated and offered by OAA: university-level study, career and psychological counselling, for students with special needs, for APEL, and student-to-student (tutors). Individual and group counselling and career seminars throughout the year are held by counsellors and professionals both from TUT and outside. Services are offered in Estonian, English and Russian.

Each faculty/college has academic counsellors, APEL advisors and internship coordinators.

Counsellors are offered training, seminars and participation at supervision, organised centrally and they are joined into networks to facilitate balanced counselling service.

TUT's Strategy for Provision of Education has set forth an objective to increase student satisfaction with counselling services in 2015 to ≥ 4.00 . According to survey 2012, student satisfaction with the counselling services was high (3.97). In some areas student awareness about the support services offered is not as high as desired.

2.4.3 STUDENT INTERNATIONAL MOBILITY

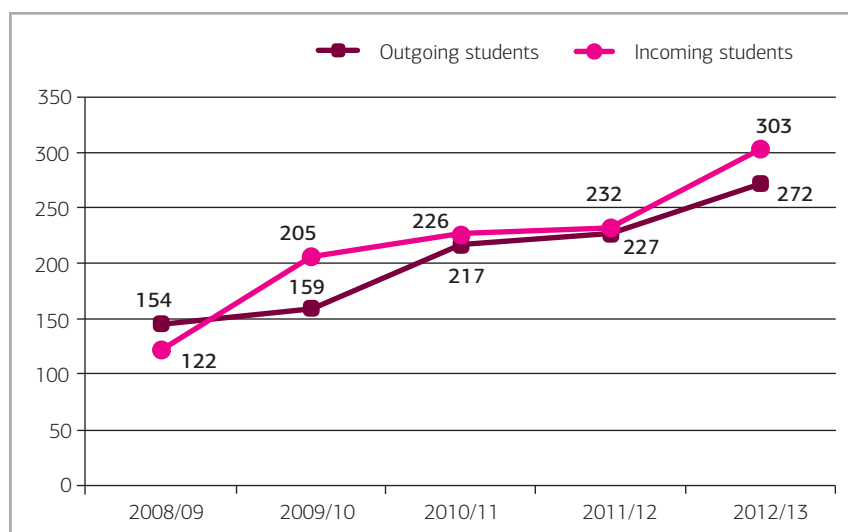
In accordance with Estonian Higher Education Internationalisation Strategy, TUT's Strategy for Provision of Education sets forth an objective of student international mobility growth. To implement the objective, the following must be ensured: necessary support services, access to all main documents of organisation of studies in English and improvement of English language skills of staff.

Student international mobility is coordinated by IRO (excl. doctoral study coordinated by RAO). Organisation of mobility is set forth in TUT Academic Policies and [Study Procedure for Visiting Students](#).

TUT students can access information about studies in foreign universities on TUT website. From 2008 Erasmus Manual is being prepared for TUT students. A community group [Tallinn Tech Students Abroad](#) in Facebook has been created, where students can share practical experience and impressions gained at the study abroad. All issues related to studies abroad are available on [Study Abroad Fair](#) page.

Information for **visiting students from abroad** is available on the [website](#). International students are provided [Summary of Erasmus Documents](#) (Checklist). Students experience strong support from ESN TUT International Club (IC) responsible for organising student leisure time events and offering a *buddy-programme* to cope better with everyday life. Integration of Estonian and international students is an on-going process at an early stage, the objective is to integrate international students into the student body. Conditions for admission of international doctoral students and doctoral student study abroad are described in [p. 3.3.4](#).

IRO focus group survey results in 2010–2012 indicate occasional diversity of teaching levels. Occasionally, English language skills of staff incl. those of support staff are insufficient. To improve the situation, PO is organising training courses of English to teaching and support staff.



The number of outgoing students in the frame of student exchange programmes is increasing year by year (Figure 25). Majority of outgoing students go to study, minority take internships. The number of 1st cycle exchange incoming students is the largest at the School of Economics and Business Administration.

Figure 25 Student international mobility. Source: IRO

2.4.4 TECHNICAL AND EDUCATIONAL TECHNOLOGY RESOURCES IN THE STUDY PROCESS

The aim is to improve the quality of teaching and learning through training and counselling of the teaching staff (both beginners and experienced) and develop the use of educational technology in the study and teaching process.

At the university level, educational technology applications are implemented and support is offered by the Education Technology Centre whose activities are targeted at:

- the introduction of new methods of instruction; organising training/seminars; individual counselling;
- assistance in e-course and blended learning design and development;
- creation of electronic study materials (animations, simulations, study videos, lecture storing) and support in video streaming and conference technology usage.

Since 2006, e-supported courses are provided in the e-study environment Moodle. The number of courses with e-support is constantly growing. In 2008/09 A/Y the number of e-supported courses was 357, whereas in 2012/13 the number grew to 851.

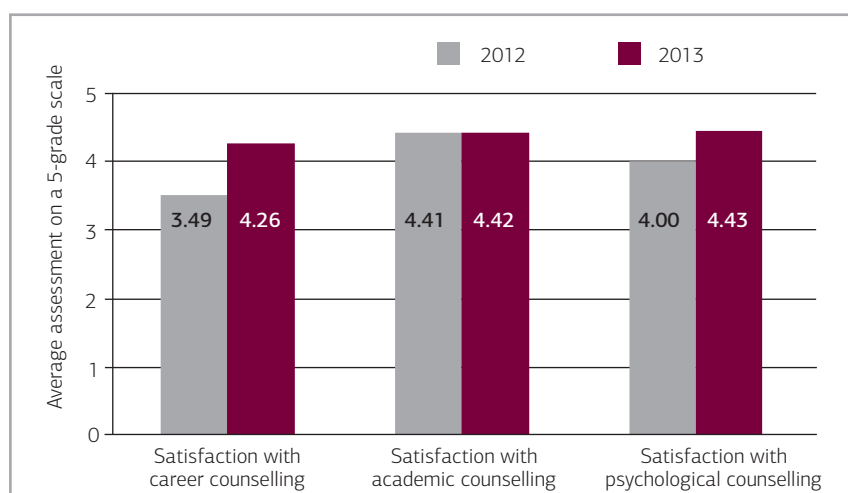
Two lecture rooms have been equipped with different devices to capture video lectures and transmit video streaming, and operated by a technician. With prior notice, lectures can be captured in other lecture rooms as well. ECHO360 pre-scheduled storage system is used to convert videos into well-known file formats. The popularity of lecture videos among students has increased and this has led to more lectures being saved on videos. Although technology is becoming more sophisticated and wide-spread (Skype, BigBlueButton etc.), the use of conference technology enables to simultaneously link 27 different partners and makes video conferencing also an attractive tool. The number of captured video lectures grew from 120 in 2010/11 A/Y to 158 by the autumn semester of 2013. Watching these video lectures increased from 5095 to 9588.

2.4.5 STUDENT FEEDBACK ABOUT STUDY AND SUPPORT PROCESS PERFORMANCE

Organisation of regular feedback surveys, analysis of results, publicising and implementation is regulated by TUT rules of feedback implementation and accreditation.

Collecting feedback about study and support process performance is an inseparable part of the feedback system. In addition to voluntary evaluations of subjects and academic staff, through SIS, each semester all the students are requested to give feedback concerning organisation of studies. To raise the response rate (currently ~28%), a more user-friendly questionnaire was implemented, from spring semester 2014, principles of publicising were changed, i.e. all students can familiarise themselves with the evaluations through SIS.

In addition to centrally collected feedback, feedback is also collected by the EQW whose consolidated results are available on EQW homepage (in Estonian).



Student satisfaction with counselling services is increasing, in particular concerning career counselling. In general, students are satisfied with academic and psychological counselling and information accessibility about counselling services (Figure 26).

Figure 26 Student satisfaction with counselling services

Satisfaction with counselling services is surveyed in the frame of yearly graduate satisfaction study. To clarify student satisfaction with counselling services, once every two years, a detailed survey is made among all students. Results of surveys are taken into account in the development of teaching and learning organisation and the counselling system, teaching staff elections etc.

TUT has set forth an objective to achieve an indicator of student satisfaction with organisation of studies and counselling services – at least 4 in the 5-score system. Results of the surveys are showing that in general students are satisfied with the study environment that offers good opportunities for individual work (2011 – 4.00; 2012 – 3.96; 2013 – 3.99), according to their opinion, study environment is updated and supportive. According to students' opinions, communication of study information needs improvement (2011 – 3.7; 2012 – 3.64, 2013 – 3.72).

STRENGTHS OF SUB-AREA 2.4

- Study environment is supportive and well equipped
- Existing integral counselling system is performing well in Estonian, English and Russian.
- Web-based feedback collection system embracing study and support processes has been developed, EQW has been initiated by the students.
- Student international mobility is increasing both for incoming and outgoing students, an effective support system is functioning to support mobility.
- Students are involved in counselling (tutoring) and decision-making processes related to the quality of studies.

IMPROVEMENT ACTIVITIES OF SUB-PROCESS 2.4

- To raise awareness of the target groups about the counselling services offered, to improve availability of counselling-related information.
- To further provision of support services to international students, to improve English language skills of staff.



3 RESEARCH, DEVELOPMENT AND OTHER CREATIVE ACTIVITY (RDC)

Strategic options in the R&D area are selected consistent with [TUT R&D Strategy](#) and [TUT Internationalisation and Innovation Strategy](#) arising from provisions made in the TUT SP. TUT legislation regulating the area is accessible in TUT document register and [on TUT website](#).

Research policy and R&D are directed by the TUT Council. Research and development activity is coordinated according to the activity area by the Vice-Rector for Research or the Vice-Rector for Innovation and Internationalisation. On the faculty level, R&D management is under the dean and directed by the faculty council, in the institution, respectively under the director and (scientific) council. The dean and the director have the right to delegate the responsibility to the vice-dean or deputy director. Coordination and organisation of R&D activity lies with RAO and IBC in accordance with their competence. Analysis and decision-making concerning R&D management is the function of the Committee for Research at the TUT Council.

Consistent with the principle of academic freedom, academic staff at TUT can select their research topics (within existing resources), at the same time providing for balanced management of the activity area. Centralised monitoring is implemented to promote sufficient research competence in each broader study area for research-based teaching and learning. The policy is ensured by realisation of the quality requirements set forth for academic staff and by transfer of central resources (baseline funding, Rector's Office reserve fund, Development Fund etc.) to areas needing remedial support.

3.1 RDC EFFECTIVENESS

3.1.1 R&D OBJECTIVES AND IMPLEMENTATION

TUT vision 2015 is to be an internationally recognised research university. In terms of TUT, research university is featured by sufficient R&D financing (R&D budget exceeds that intended for study) and a stable share of doctoral degree graduates (~5% of graduate total).

R&D objectives are defined in TUT SP, R&D Strategy and TUT Internationalisation and Innovation Strategy. R&D performance and fulfilment of results are analysed by RAO, effectiveness is evaluated by the TUT Council as prescribed by established regulation. Results of the analysis are publicised in R&D Annual Reports. Fulfilment of R&D objectives is monitored by the TUT Strategy Committee.

FULFILMENT OF R&D PERFORMANCE INDICATORS

- **Scientific publications, inventions**

Objective 2015: to publish at least 1.3 pre-reviewed scientific publications²⁵ for one full-time academic staff position and 2200 scientific publications²⁶ by TUT members

To enhance international competitiveness of the TUT academic staff and international recognition, which is essential to promote the quality of publications. Elections/re-elections and performance reviewing of academic staff are directly linked to publication of a defined number of high-quality research articles. To promote the quality of a research article, an annual competition is organised for TUT best research articles. Competitions are also held by faculties/institutions to acknowledge their best staff.

To motivate publication of research results, particularly in high level science journals (Science, Nature), working groups following the policy are allocated supplementary financing over a three-year period.

²⁵ Publications 1.1, 1.2, 2.1 and 3.1 according to [ERIS classification](#)

²⁶ Total publications 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.4, 3.5, 4.1, 4.2, 5.1, 5.2 according to ERIS classification

In the recent years, the number of high-level publications for one academic staff member has increased, however strong efforts are needed to fulfil the objective set forth. Comparison with UT shows that TUT moves at a slower pace (Figure 27). Neither has total number of publications increased as desired (Figure 28).

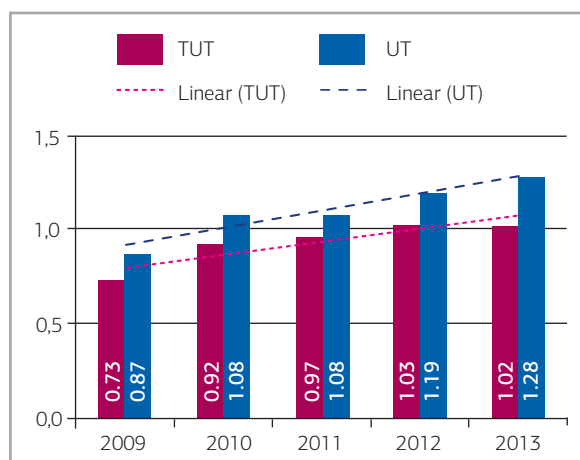


Figure 27 Dynamics of scientific publications (1.1, 1.2, 2.1, 3.1) per one full-time academic position at TUT and UT. Source: TUT R&D annual reports; UT Rector's Office

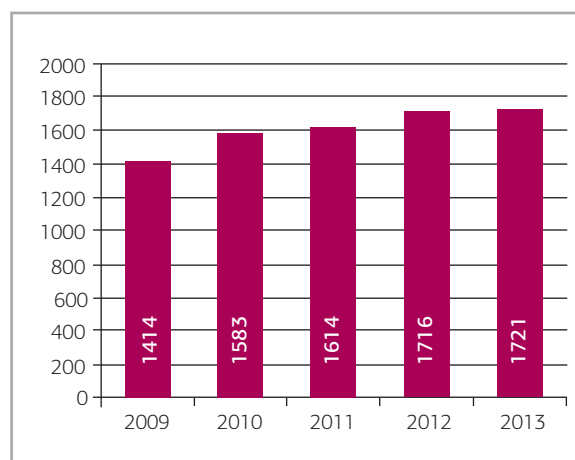


Figure 28 Number of TUT scientific publications. Source: TUT R&D annual reports

Besides publication, another scientist's performance indicator is the number of [patent applications and patents](#). In 2009–2013 total number of patent applications filed by TUT is 85 and the number of patents granted is 68. Decision on legal protection of the inventions are taken by the Expert Committee of Industrial Property whose evaluation, among other criteria, includes the commercial potential of the invention. Commercialisation of inventions is mainly targeted to: offering tenders to companies interested in the technology and contributing to creation of TUT spin-off companies. To support innovative ideas for prototype creation, an [NPO Innovation Foundation \(Prototron\)](#) was founded. In 2013 three ideas based on TUT intellectual property have acquired financing through Prototron whose advancements will obviously lead to future [TUT spin-offs](#). Two enterprises (AbleTrace OÜ, SafeToAct OÜ) that are also based on protected intellectual property have been created in TUT's participation. A licence contract has been concluded with an enterprise abroad.

• Defence of doctoral degrees

Objective 2015: to reach an annual defence of 90 doctoral theses

To ensure academic staff renewal and a sufficient quantity of highly qualified leaders/developers in the public sector and high-tech companies, figures of annual doctoral student admission set forth by state-commissioning (Figure 29) have been exceeded and several measures stimulating the effectiveness of doctoral studies have been introduced. Emphasis is on the selection of doctoral student supervisors and appointment of co-supervisors. To acknowledge successful defence, performance-based payments to the doctoral student and the supervisor were introduced. From 2012 doctoral students acquire a motivation scholarship.

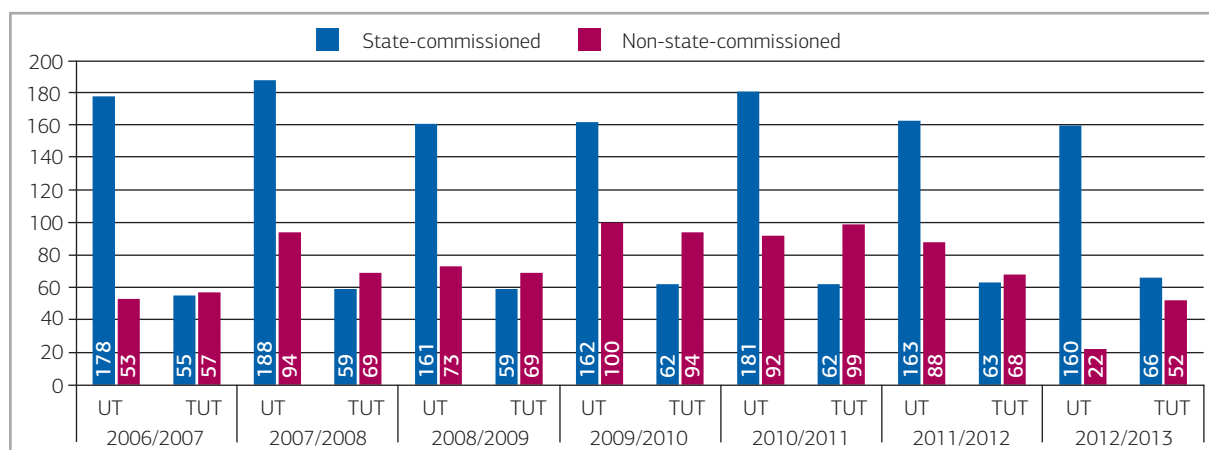


Figure 29 Admission of doctoral students at TUT and UT. Source: <http://www.haridussilm.ee/>

The last four years have seen a stable increase in doctoral degree defences, whereas a significant decrease occurred in 2013. Reasons for low figures in some faculties are being analysed.

As compared to UT, the number of doctoral degree defences at TUT is at a moderate level, which is explained by the difference in overall doctoral student body (admission to doctoral study at UT exceeds nearly twice that of TUT, incl. significantly higher state-commissioning at UT than at TUT, Figure 29).

At the same time dynamics of TUT defence figures is slightly higher (Figure 30). In view of the current trend, obviously it is difficult to achieve the performance indicator set forth.

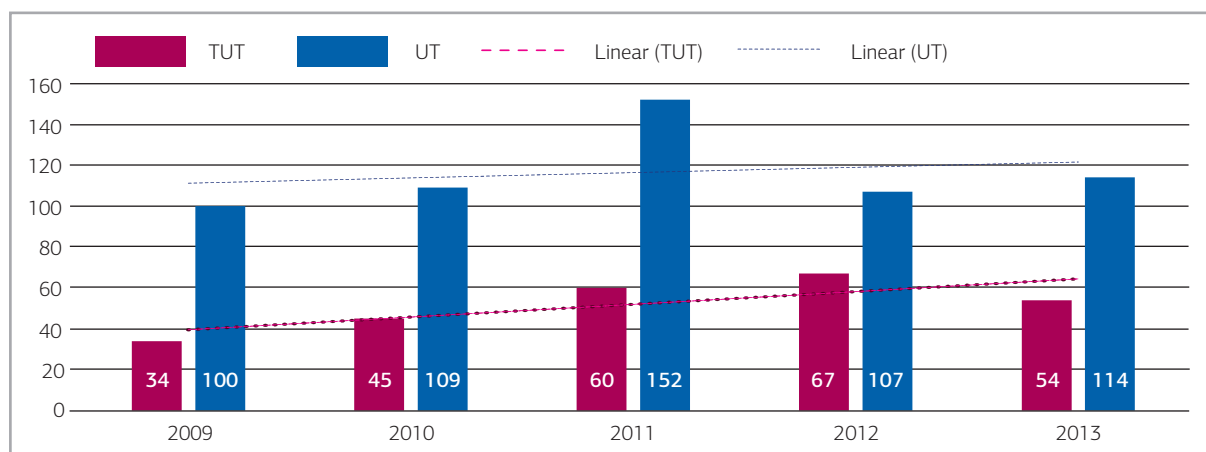


Figure 30 Defence of doctoral degrees at TUT and UT. Source: TUT R&D annual reports, UT Rector's Office

• R&D financing

Objectives 2015: to achieve R&D share of over 50 % in overall study and R&D budget, contract-based research at least 5.2 mln €

To ensure sustainable development of R&D, TUT is seeking additional resources from different national and international sources, is involving enterprises and the public sector into active cooperation. Of high significance in the growth of financing are national R&D programmes. In the national programme rounds of applications, 28% of the total assigned support sources have been acquired, incl. 66% in the energetics programme and 41% in ICT. However, financing from the MER budget has decreased (Figure 31).

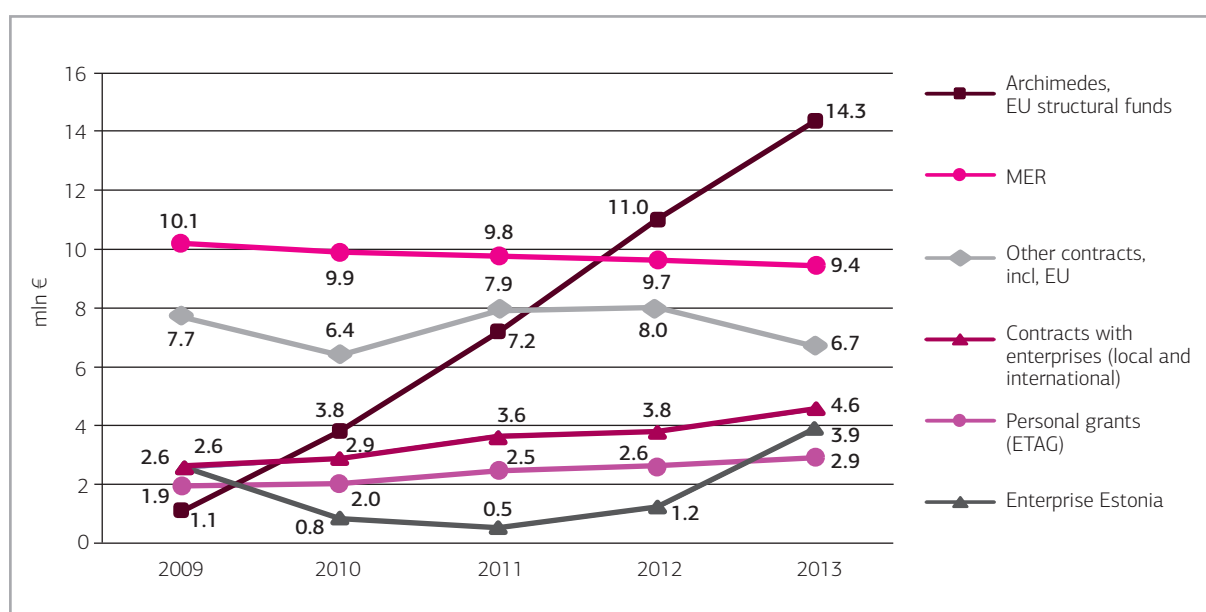


Figure 31 Sources of TUT R&D financing. Source: TUT R&D annual reports

Due to diversity of financial sources to seek from, in particular, thanks to successful performance targeted to the financial measures of the EU Structural Fund (Figure 31), the objective set forth has been achieved. Share of R&D income in teaching and learning and R&D income has been increasing year by year, constituting ca 51% in 2012, 52% in 2013 (Figure 32).

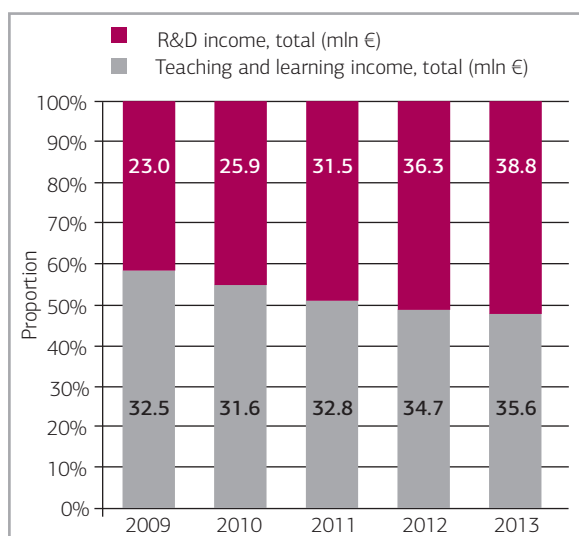


Figure 32 TUT R&D financing, volume (mln €) and share of income (%). Source: OEF

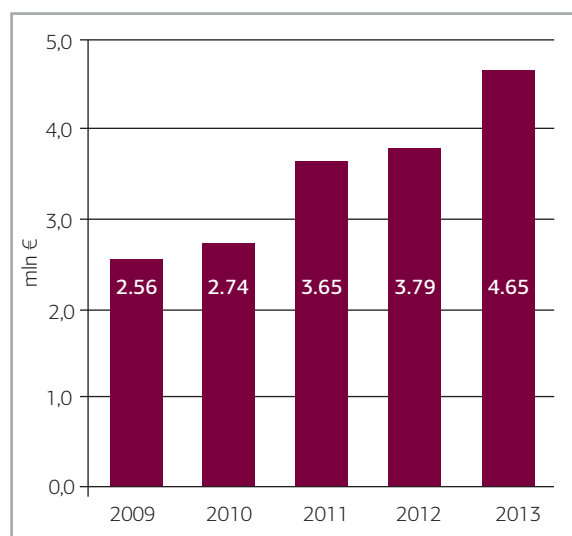
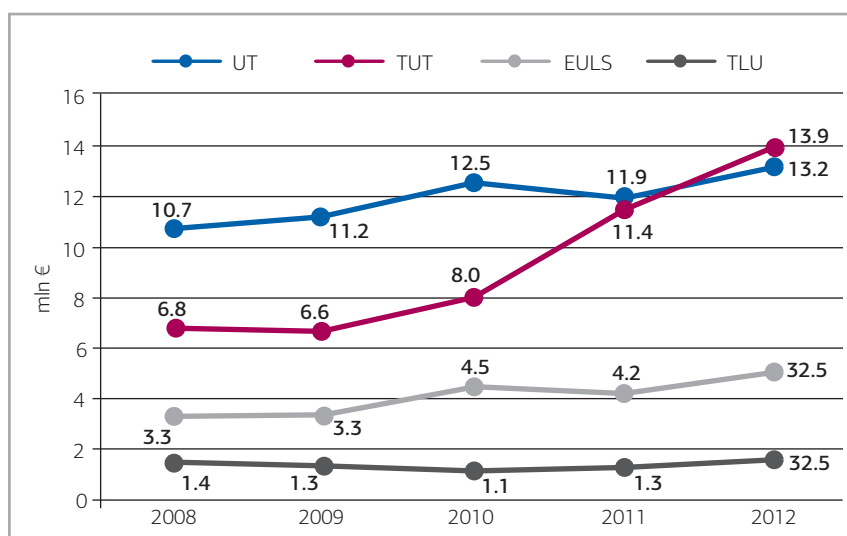


Figure 33 Financial volume of contracts with business, mln €. Source: TUT R&D annual reports

Income from services provided to enterprises (Figure 33) has been on continuous increase. TUT is actively promoting results and services both to existing and potential new cooperation partners. Services provided to enterprises are publicised on TUT webpage under "[Innovation](#)". Good cooperation is pursued between universities and enterprises in competence centres oriented to long-term cooperation in [Competence Centres](#). TUT is participating in five competence centres. Participation in the activity of 13 clusters is targeted to industrial advancement in the relevant fields. Broader opportunities for cooperation relations with enterprises have been created by [IBC Mektory](#) opened in 2013. Currently, Mektory activity involves ~60 enterprises.



R&D financing between larger Estonian universities is compared on the basis of BF source data (Figure 34). In the recent years, TUT has made good progress, passing UT in 2012 who has held the leading position so far.

Figure 34 Contract-based R&D financing²⁷ in larger Estonian universities (mln €). Source: MER

In line with internal evaluation, TUT has passed several external evaluations. In the regular evaluation in 2010, the result was positive in all R&D areas. TUT and UT were the only Estonian R&D institutions granted a positive decision in all the four areas evaluated. In addition to regular evaluation, TUT has participated in all targeted evaluations conducted in Estonia. Evaluation results have been reviewed at the Committee for Research meetings. Proposals for improvement of R&D activity were accepted and remarks and recommendations in the reports have been implemented in SU activity planning.

²⁷ According to MER regulation no. 11 of 21.03.2005, "Conditions and rules of allocating baseline funding to R&D institutions", § 3 subsection 2: income from funding of legal person in private law and from projects and tenders in their interests, income from fundamental and applied research or development activities funded in the framework of national R&D programmes; income from projects and tenders in the interests of the enterprises, independent of the financier in the framework of Enterprise Estonia R&D project support programmes; income acquired from licence sales and patents; income acquired as support from non-state-commissioned external resources for fundamental and applied research and development activity.

3.1.2 CONSIDERING THE NEEDS OF SOCIETY AND THE LABOUR MARKET IN R&D PLANNING

TUT R&D activities are planned in SPs and strategies taking into account opinions and feedback from stakeholders, incl. those of the representatives of the business and the public sector. Institutional SP preparation and analysis of performance involve the Board of Governors. Preparation and implementation of faculty/institution SPs is subject to discussion in the faculty/institution council composed of representatives of relevant narrower specific fields.

Coordinated by IBC functioning as the technology transfer centre, active cooperation is pursued with Estonian enterprises, state institutions and local governments. SUs are actively involved in cooperation projects with enterprises. Under frame contracts with major Estonian enterprises (Eesti Energia, BLRT, Ericsson Estonia, ABB, Leibur etc.) cooperation is operating in the areas of competence, whereas parties' interests in the area of R&D are specified. Substantial cooperation is furthered in the frame of Competence Centres. TUT projects under the national R&D programme targeted to development of products, technologies and services at larger added value also involve enterprises. Mutual cooperation in that area is effective.

TTU has a good cooperation with major companies in Estonia. For example TUT has regular meetings with ABB and Ericsson Estonia. Round-tables are organised with professional societies and regular meetings with company representatives are organised to find potential cooperation areas with TUT. Close vicinity of the business environment – Tallinn Science Park Tehnopol – has promoted cooperation with TUT. Joint seminars/events are organised. To support innovative and creative ideas of prototyping, NPO Prototyping Fund (Prototron) was established.

Cooperation with enterprises is acting directly through the DoRa programme measure "Research cooperation between universities and business" targeted to the labour market needs, which supports doctoral students whose research is conducted in close cooperation between the university and a company. Under that measure, 27 TUT doctoral students have started their studies, 2 have defended their doctoral degree.

STRENGTHS OF SUB-AREA 3.1

- Successful performance in the application rounds of the national R&D programmes.
- R&D budget volume exceeds that of teaching and learning.
- Successful participation in the activity of 7 Estonian Centres of Excellence and 5 Competence Centres.
- Several structural units are successful at international R&D project competitions.

IMPROVEMENT ACTIVITIES OF SUB-AREA 3.1

- To analyse organisation of doctoral studies, incl. quality of supervision and effectiveness of doctoral study performance, to prepare an action plan for improvement of the activity.
- To implement a systematic policy that encourages scientists to publish their research results primarily in high-quality science journals.
- To pursue more active cooperation with the business sector.

3.2 RDC RESOURCES AND SUPPORT PROCESSES

3.2.1 R&D SUPPORT SYSTEM

Coordination and organisation of R&D area activity on the institutional level lies with RAO and IBC.

RAO's function is to coordinate preparation of policies and organisation in the areas of R&D and doctoral studies, participation of SUs in diverse level projects, to further contacts with other universities, research institutions, organisations and foundations, activities related to evaluation; RAO operates to coordinate analysis/reporting of R&D activity, to communicate information, to advise TUT members, and to organise information meetings and staff training.

IBC's duties are to coordinate internally the cooperation of innovation and entrepreneurship, cooperation with domestic and international businesses, development and provision of support services result-

ing in higher effectiveness of innovation, business, regional activities and knowledge and technology transfer in TUT. Advising activities related to intellectual property protection and management of [TUT patent portfolio](#) are within the responsibilities of the centre. Activities of the centre are supported by the [Spinno programme](#). The programme has promoted development and creation of a system for furtherance of cooperation with businesses and preparation of processes for commercialisation of intellectual property.

TUT Library is a R&D unit providing scientists' access to required databases, journals (incl. e-journals) and other essential resources. Library publishes, and organises printing and distribution of science literature, publicising of doctoral theses defended at TUT and R&D annual reports in the digital collection.

TUT computing cluster of the Estonian Scientific Computing Infrastructure facilitates the research computing services.

TUT has introduced regular surveys of satisfaction with R&D support services. According to survey 2011 and 2014 results, staff satisfaction has risen from 88.7% to 89.5%.

3.2.2 FINANCIAL RESOURCES FOR R&D DEVELOPMENT

TUT R&D financial resources are reviewed in detail in the analysis of R&D performance indicators (see [page 47](#)).

To ensure stable/increasing R&D financial resources, TUT is seeking resources from diverse national and international R&D financial resources. TUT researchers are actively participating in various application rounds in their areas of competence.

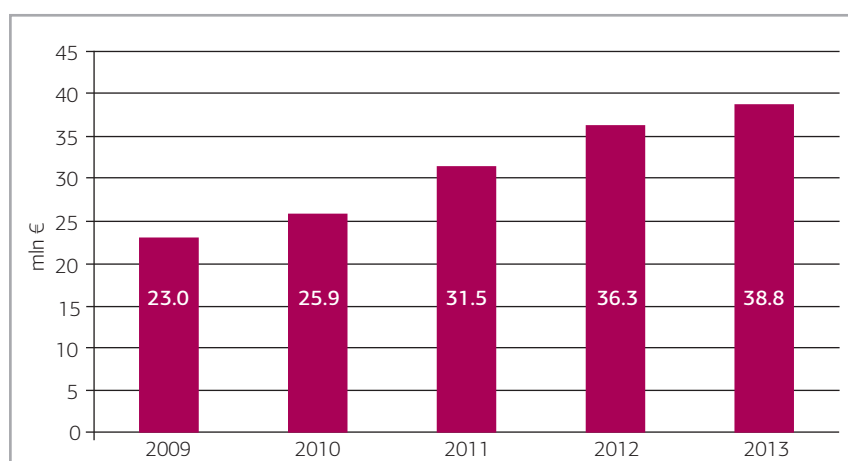


Figure 35 TUT R&D financing, total (mln €). Source: TUT R&D annual reports

Of recent achievements, successful performance at the 2013 application round of the EU pilot Project “ERA Chairs” is distinguished: out of all applications from the Baltics, funding was acquired for the area of chemical and biomass treatment at TUT. Out of 111 applications to the competition, only 11 were granted funding, each allocated up to 2.4 mln euros to boost research capacity.

In the forthcoming years, R&D financing is endangered because of the structural fund period terminating, which can lead to reduced financing. The same relates to new measures (institutional and personal research grants) launched hastily by MER, in which TUT has not been successful enough in recent years. To improve the situation, relevant analyses and proposals recommend reorganisation of the research groups have been carried out; future prognoses have also been prepared. Because of limited resources of the institutional grant competition, some research groups acquired no funding; alternative support from BF resources within one year is provided to encourage the research groups to apply in the next application round or seek resources for their R&D financing from other contracts/grants.

It is essential to keep, if possible to increase, the share of external resources in R&D financing, incl. successful performance in the competition for the Horizon2020 measures. Focus is on successful participation in the measures of the new budgetary period of the structural funds: information events for application rounds are organised, RAO communicates information about the competitions, provides daily consultations and assistance in project writing in any way.

To enhance management capacity in the implementation of projects of external resources and coherence funds, procedures for seeking and conducting projects funded from foreign sources have been established.

3.2.3 PARTICIPATION IN RDC NETWORKS

Objective: to advance international and national collaboration

Participation in international networks on the institutional level and joining new cooperation networks is coordinated and mapped by IRO. Decisions concerning joining/withdrawal from the networks are taken by the Rector, taking into account TUT's priorities.

To promote international cooperation, TUT is participating in several cooperation networks: [CESAER](#), [SEFI](#), [UNICA](#), [Baltech](#), [EUA](#), [Campus Europae](#).

TUT researchers represent Estonia in the standing committees of physical and engineering sciences and social sciences of the European Science Foundation. Several research groups are participating in the COST project networks. The only representative from Estonia, TUT professor Peep Palumaa, was elected member of [EMBO](#).

To promote updating of research news in the specific field, adequate communication of TUT's research results and development of direct contacts with researchers from foreign countries, staff are participating on the SU and individual level, both in national and international associations, professional societies, centres, networks practically in all TUT R&D areas. For instance, TUT researchers are participating in the following international R&D networks: [Pan-European Infrastructure for Ocean and Marine Data Management \(SEADATANET\)](#), [Baltic Energy Efficient Network for the Building Sector \(BEEN\)](#), [Baltic Biomass Network](#), [European Mechanics Society \(EUROMECH\)](#), [European Microbeam Analysis Society \(EMAS\)](#), [Association of European Operations Research Societies](#), [European Energy Research Alliance \(EERA-PV\)](#), [European Foundation of Management Development \(EFMD\)](#), [European Association of Work and Organizational Psychology \(ENOP\)](#), etc. Detailed information is available in the Annual R&D Reports of SUs.

TUT is participating actively in the National Centres of Excellence, Competence Centres, Doctoral Schools and in the objects of the Research Infrastructure Roadmap that involve partners from several universities.

TUT Library has joined several network activities: Consortium of Estonian Library Network, International Association of Technological University Libraries, Biblioteca Baltica etc.

TUT staff holds 21 EstAS members; 13 scientists are members of 17 different foreign academies.

3.2.4 UPDATING AND USE OF R&D INFRASTRUCTURE

Objective 2015: to further the infrastructure in all R&D areas

In the last years, R&D equipment was updated mainly from the sources in the framework of the measure of structural funds "Updating of research equipment". A total of 15.2 mln € was acquired under the framework. R&D equipment has been updated in the areas of materials science, ICT, chemistry and biotechnology, environmental technology, power engineering, and building where the research infrastructure keeps up to good international level. [See also 1.3.1.](#)

Prior to the participation in the application rounds, R&D equipment was mapped, which resulted in an overview of the condition, load of use of the existing equipment and need for new equipment. The results were taken into account in the preparation of TUT applications to be submitted.

Smaller investments have been made into R&D projects from the budgetary resources assigned.

To review R&D equipment and load of use, in 2012 in collaboration with Riga Technical University under the INTERREG project [UseScience database prototype](#) was created that contains data on research equipment. In addition to universities, the database updated continuously can be used in the future by other associated institutions.

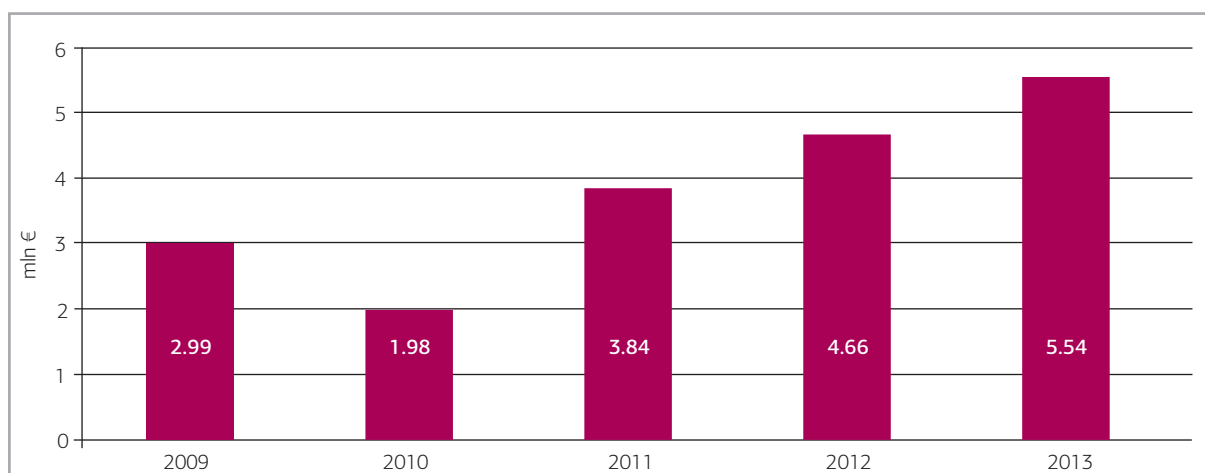


Figure 36 TUT investments to R&D equipment, mln €. Source: OEF

STRENGTHS OF SUB-AREA 3.2

- Support services required to research staff are ensured, satisfaction with the services offered is increasing.
- Objective of the SP for R&D financing has been fulfilled.
- Share of research staff within academic staff has grown.
- Good international level research infrastructure has been developed.
- TUT Library provides good access to research information.

IMPROVEMENT ACTIVITIES OF SUB-AREA 3.2

- To implement a systematic approach to mapping of SU participation in RDC networks.
- To analyse TUT's potential to offer larger capacity R&D services to enterprises; to diversify cooperation possibilities.
- To participate more actively in international R&D calls for proposals.
- To analyse loading of R&D equipment and possibilities for joint more effective equipment use.

3.3 STUDENT RESEARCH SUPERVISION AND DOCTORAL STUDIES

3.3.1 STUDENT INVOLVEMENT IN RESEARCH, CREATIVE OR PROJECT WORK

In general, it is the departmental effort to include students in the R&D since the research groups are mainly department-based. An opportunity is open to students to address competent staff in the SU or directly the teaching member. Information concerning research projects in the university is available for students on the faculty homepages and [ERIS](#). Many master/doctoral students are engaged in EstRC's personal or institutional grants. Rules of these national measures enable scholarships to be paid to master/doctoral students for their work in the projects. To promote innovative ideas of students, several laboratories have been created in the [Mektory's](#) supportive environment.

Research and creative activities are also offered by different student organisations, clubs. Their activity is financed by the Student Union within their budgetary resources on an annual or project basis. Faculties are supporting several student clubs ([Robotics Club](#), Mining Club, [Formula Student](#) etc.). Many students take part in the [NPO WinterAcademy](#) activity that joins students of Estonian larger universities (competition of research articles, conferences etc.). TUT is among the supporters of the WinterAcademy.

Students have been successful at national student R&D competitions (EstAS, MER). Results are reviewed in the R&D annual reports.

As a rule, in the teaching and learning process, research work is introduced from the master's study cycle.

Involvement of **doctoral students** in R&D is regulated by Good Practice of TUT Doctoral Studies. Most of doctoral students function as executors in research projects, or conduct R&D in the field directly related to their doctoral research at their employers. Approximately one third of state-commissioned doctoral students are employed at TUT, mainly in the positions of an early stage researcher or teaching staff. As a rule, non-state-commissioned doctoral students work outside TUT.

Student satisfaction with supervision is surveyed yearly in the framework of graduates' satisfaction, which embraces all the students (excl. doctoral studies). The results of the survey (Table 6) revealed that integrated and master's study students are generally satisfied with supervision, they have good contact with the supervisor who is sufficiently supportive. At the same time, bachelor's and professional higher education students expect more support from the supervisor in the preparation of their graduation theses.

Table 6 1st and 2nd cycle student satisfaction with supervision. Average assessment on a 5-grade scale

Year	Bachelor's studies	Professional higher education studies	Integrated studies	Master's studies
2012	4.16	3.82	4.52	4.34
2013	4.02	4.06	4.5	4.35

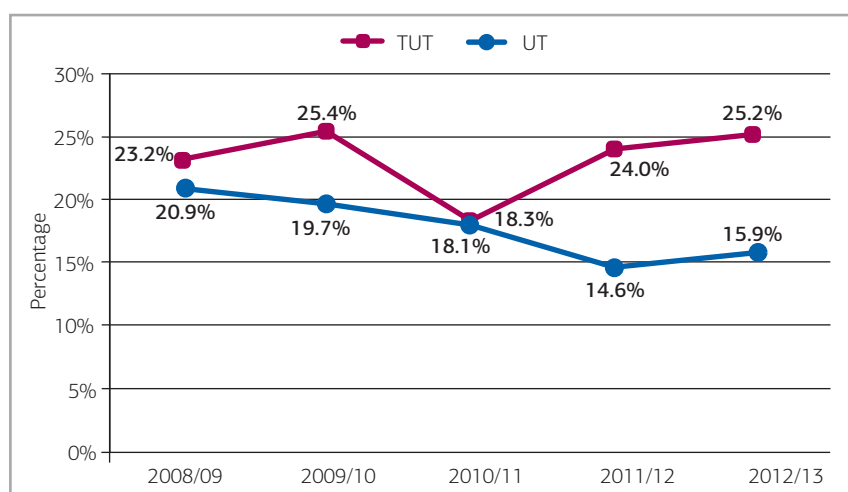
Doctoral student feedback concerning supervision is collected on the faculty/department level (attestation, doctoral seminars). Regular feedback is collected also by EQW. Feedback in the frame of the project is collected every two years. Reports of satisfaction surveys are forwarded to the faculties, Rector's Office and OAA. Feedback is implemented in improvement activities. EQW research reports, results and faculty responses are available on EQW homepage (in Estonian).

3.3.2 PROFESSIONALISM, EFFECTIVENESS AND WORKLOAD OF SUPERVISORS AND GRADUATION EFFICIENCY

The supervisor of a doctoral student carries a substantial role in the timely completion of doctoral studies and the quality of the doctoral theses. Approaches to the selection of a suitable supervisor vary across SUs. According to common practice, doctoral student candidates select supervisors on their own in cooperation with the study programme leader or department/faculty head. Supervisor appointment depends on prior performance, workload, participation in research topics and availability of research resources. If necessary, a proposal may be made to appoint a co-supervisor.

A supervisor's optimal load is specified in the Good Practice of TUT Doctoral Studies, which provides that as a rule, one supervisor may have up to five doctoral students to ensure adequate attention to each student. However, at the end of 2013 ~9% of main supervisors had more than five doctoral students. In single cases, it does not affect the effectiveness of supervision, but more attention should be paid to ensuring an optimal load of supervisors.

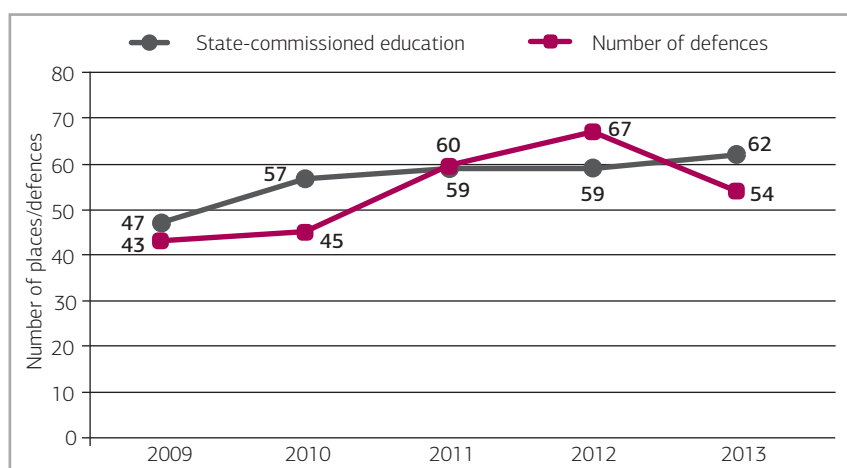
Main **requirements to the quality of doctoral theses** are defined in the [Universities Estonia Agreement on Good Practice](#) and specified in the TUT [Rules on the Termination of Studies](#). The defence of the doctoral theses requires at least two external opponents, including one from outside Estonia. To ensure high quality of the doctoral thesis, in several faculties pre-defence is arranged prior to issuing the permission to the defence, the aim is to acquire reviews of recognised scientists in the relevant area.



According to common practice, TUT analyses the effectiveness of doctoral studies and compares the data with UT (Figure 37). Although TUT graduation effectiveness is higher, to reach the objective set in TUT Strategy for Provision of Education (goal for 2015 – 40%) in the forthcoming years is improbable.

Figure 37 Effectiveness of doctoral studies at TUT and UT. Source: TUT SIS, UT Rector's Office

An average duration of doctoral studies on the basis of the doctoral degree defences 2009–2013 at TUT is 5.5 years.



The number of doctoral degree defences was increasing up to 2012. The setback 2013 returned TUT to the situation that made it difficult to fulfil the objective agreed on four years ago (Figure 38).

Figure 38 Implementation of performance contract (doctoral studies) at TUT. Source: TUT R&D annual reports

Data of the defences of doctoral degree are analysed on the basis of the study programme as well as on faculty/institution. Results are presented in R&D annual reports.

3.3.3 STUDENTS GUIDED TO RECOGNISE PLAGIARISM AND TO AVOID IT

TUT considers academic honesty of high significance, disgraceful conduct and breach of good academic practice are not tolerated. Issues related to plagiarism are addressed first in the freshmen subject of organisation of studies. Under the subject it is compulsory to pass the course of information search, within which the concept of plagiarism is explained. Students are provided with instructions for accurate references in graduation theses where the idea of plagiarism is clarified.

Cases of breach of good academic practice and disgraceful conduct are defined in the TUT Academic Policies. In cases of breach of rules, the dean/director of the college, depending on the seriousness of the case, has the right to issue a disciplinary reprimand or expel a student.

Submission, plagiarism check and publicising of a graduation thesis is regulated [in Procedure for Publication and Preservation of Graduation Thesis](#) and [Procedure for Publication of Doctoral Thesis](#). Doctoral theses are subject to check by the plagiarism detection software [iThenticate](#).

From 2011 a joint project "Development and implementation of an updated plagiarism detection system in the work organisation of higher educational institutions" is operating with UT, TLU, EULS and EBS²⁸. The system is targeted to improve the quality of teaching and learning and inter-university co-operation through a system of graduate theses comparison.

In 2013 EQW collected and presented to faculties feedback about cribbing. The feedback collected indicated a need to do more research into the issue. From the autumn semester 2013, a student feedback form was entered a question about the attitude to cribbing, i.e. whether any cribbing check was used in a subject. The results of the first survey will reveal if any mechanisms of intervention can be elaborated.

3.3.4 CONDITIONS FOR ADMISSION OF INTERNATIONAL DOCTORAL STUDENTS AND FOR DOCTORAL STUDENTS' STUDIES ABROAD

Objective 2015: TUT is internationally attractive and recognised university with multi-cultural student body, share of international doctoral students in overall doctoral student body is at least 10%

Purposeful activities have been planned to reach the objective, incl. furtherance of required support services.

Admission information to international doctoral students is available on [TUT homepage](#). Counselling is functioning on a year-round basis, more intensive activity takes place prior to admission. To help select the topic of the doctoral thesis and the potential supervisor, reference is made to the webpages of faculties/institutions. If required, potential candidates are assisted to find and contact the supervisor. Documents certifying education of the candidates from third countries, at their agreement, are presented to Estonian ENIC/NARIC Centre for verification. Admission requirements of international doctoral students are equal to those of Estonian doctoral students. In the conditions of growing internationalisation of doctoral studies, TUT's policy is to introduce a more flexible system of doctoral student admission throughout the year.

²⁸ Estonian Business School

Doctoral students are helped and advised in procedures concerning application of residence permit and ID-cards, medical insurance, opening a bank account, seeking accommodation in TUT hostels and in other organisational issues related to relocation.

At the end of 2013 international doctoral student enrolment was 63 (~8% of TUT doctoral students; in 2009 – 4.5%). Based on the present trend, the objective set forth in the TUT SP will be achieved.

Engagement of talented international students in the doctoral studies at Estonian universities is supported by the DoRa programme. TUT has acquired support from the programme to finance studies of 27 international doctoral students.

Short- and long-term **studies abroad** for **doctoral students** are supported by several national financing measures: Doctoral Schools, DoRa programme, Kristjan Jaak Scholarship Programme. Complementary bi-party cooperation programmes and agreements that support student mobility are operating on the faculty and department level. Short-term foreign visits are relatively popular with doctoral students, mainly thanks to the DoRa programme and Doctoral Schools. In the frame of DoRa, 709 instances of short-term doctoral student visits were supported in 2009–2013. In the Doctoral Schools, 3-month foreign visits by doctoral students and participation in conferences are most frequent. In 2009–2013 more than 80 TUT doctoral students were supported by the DoRa programme to study a semester abroad. In addition to central measures, supplementary resources are assigned by SUs.

3.3.5 INCLUSION OF FOREIGN SCIENTISTS IN THE PROVISION OF DOCTORAL STUDIES AND SUPERVISION OF DOCTORAL THESES

According to TUT regulations, the main supervisor of a doctoral student must be member of TUT staff or an employee of an institution operating under an agreement with TUT. Majority of foreign members of academic staff employed by TUT are either main or co-supervisors. Inclusion of foreign supervisors outside TUT depends on the topic of the doctoral thesis and on the main supervisor's competence. Inclusion of additional supervisors is a more frequent practice in case of interdisciplinary theses. A need for a foreign co-supervisor is determined by the main supervisor. The doctoral student can also make a relevant proposal. As a rule, a foreign supervisor is selected in joint project work or through direct contacts based on other cooperation. Involvement of foreign co-supervisors is a support activity of Doctoral Schools as well. Out of doctoral students who defended their theses in 2009–2013, 28 had a foreign co-supervisor (i.e. 10.7%).

In the last years more agreements including international joint supervision have been concluded that confirm doctoral students' enrolment both at TUT and at some foreign university and a supervisor from both universities. In that case, at completion of studies, the student is granted a doctoral degree from both universities. Frame agreements operate with Swinburne University in Australia, Kempten University of Applied Sciences in Germany; three-party agreements have been concluded with KTH, Aarhus, Aalto and Nantes University, new agreements are under preparation.

Share of opponents from foreign countries at the doctoral degree defences shows a rising trend. A frequent practice is that instead of one foreign opponent, both of the opponents come from abroad.

STRENGTHS OF SUB-AREA 3.3

- Conditions have been created and support activities ensured for international doctoral student admission.
- Students are provided opportunities for participation in research and project work and in activities related to technology transfer, in cooperation with Mektory and Tehnopol.
- Recognised scientists and professors from foreign countries are included in the supervision of doctoral studies.
- Majority of doctoral students are engaged in Doctoral Schools.

IMPROVEMENT ACTIVITIES OF SUB-AREA 3.3

- To analyse workload of supervisors and effectiveness of supervision to ensure adequate attention to the supervised and graduation at the nominal period; to increase the number of doctoral degree defences.
- To introduce regular satisfaction surveys of doctoral students to find out reasons impeding graduation within a nominal period.



4 SERVICE TO SOCIETY

Along with R&D and degree level studies, priorities of TUT lie in service to society:

- popularisation of core activities in Estonia and abroad, cooperation with schools, participation in advisory/decision-making bodies;
- provision of lifelong learning (continuing education, pre-university education, teaching in general education schools, senior study opportunities etc.);
- regional activity (degree level/continuing regional education, regional competence centres, co-operation agreements with regional partners targeted to promotion of economic development etc.);
- cooperation with enterprises and the public sector;
- public-oriented services in the areas of teaching and learning, R&D and in other areas;
- publishing study and information materials;
- cultural activity (choirs, folk dance ensemble, theatre etc.);
- sports activity (incl. support to top sports);
- alumni activity.

4.1 POPULARISATION OF THE CORE ACTIVITIES OF THE UNIVERSITY AND ITS INVOLVEMENT IN SOCIAL DEVELOPMENT

4.1.1. POPULARISATION OF TUT'S CORE ACTIVITIES

Objectives of popularisation of TUT's core activities are defined in TUT M&C Strategy. Focus in the teaching and learning and R&D activities is on the popularisation of the broader area of STEM. Activities are targeted to school students (courses, workshops, fairs, visits to TUT and enterprises; cooperation is operating with more than 100 general education schools), within projects targeted to parents/alumni and teachers, enterprises and investors and wider public-oriented activities etc. Regular teaching (practice, lab work) in 15 schools whose students' aspiration in daily study is to acquire top knowledge and use the infrastructure and prepare for the mathematics olympiads. Yearly over 20 000 young people are attending different events in the frame of popularisation.

Communication and popularisation of the core activities of TUT in the media, according to the media-related operation plan, is the function of MCO. Approximately 200 press releases are announced yearly; references in the media constitute approximately a yearly total of 5 000. Of the media most frequently used are TUT website, journal, youth journal, electronic newsletters, national journals/papers and Internet editions, radio and TV programmes etc. TUT has strategic agreements with the national broadcasting and major media editorial staff, in addition, with accredited foreign journalists. Proactive approaches are implemented to building contacts with journalists, incl. science journalists (encounters-meetings, training, offering news stories etc.). Focus in communication is primarily on provision of expert evaluations and involvement in entrepreneurship issues.

A major role in the popularisation of TUT activities is carried by MCO, faculties, OU, TUT Technology School, Mektory, TUT Museum, Observatory and by other SUs. [See also p. 4.3.1.](#)

4.1.2 PARTICIPATION OF EMPLOYEES IN THE ACTIVITIES OF PROFESSIONAL ASSOCIATIONS AND SOCIETIES AND AS EXPERTS, IN DECISION-MAKING BODIES

TUT staff members are represented practically in all professional associations/societies in TUT's areas of activity, in some instances holding leading positions. Examples of their contribution in the boards of professional societies are: elaboration of requirements for professional qualification, description of area competence and evaluation of professional skills of applicants seeking certified professional qualification. Experts from TUT are engaged in 18 professional boards.

As an area competence centre, experts from TUT are engaged in working groups under several ministries and public institutions to elaborate on strategies, policy and legislation:

- Ministry of Economic Affairs and Communications (industry, commerce, energetics, housing, building, transport, transit trade, logistics, traffic regulation, traffic safety, informatics, telecommunication, development of information systems, regional development of entrepreneurship etc.);
- Ministry of the Environment (organisation of environmental and natural protection, organisation of use and protection of natural resources, nature and marine research etc.);
- Ministry of Defence (defence research and cyber security);
- Ministry of Agriculture (development of food industry, food safety and safety requirements);
- Ministry of Finance (national finance, tax and customs policy, economic analysis and prognosis, development of the public sector, management of immovables etc.);
- Ministry of Internal Affairs (population and regional development and organisation of regional government).

TUT staff participate in the following activities: formation of national development strategies and policies, decisionmaking concerning the development of Tallinn and through regional colleges in Tartu, Kuressaare and Kohtla-Järve (municipal council, vision advisory board, committees, working groups, etc.). Two members of Estonian Bank Supervisory Board come from TUT.

TUT representatives are members of important national decision-making and advisory bodies in the field of R&D: R&D Council, Research Policy Committee, Estonian Research Council's Evaluation Committee, Council of Information Society, Board of EstAS, Estonian Higher Education Quality Agency Quality Assessment Council. Staff members also participate in the MER and EstRC working groups intended for analysis of regulations of higher education and R&D measures. Consistent recommendations have been made to improve the regulations.

STRENGTHS OF SUB-AREA 4.1

- Good performance in cooperation with general education schools is revealed in the popularisation of core processes.
- Strategic agreements with national broadcasting and with editorial staff of major media publications publicise results acquired by TUT to the public.
- Staff members are represented in the professional associations/societies for most TUT activity areas, acting in leading positions.

IMPROVEMENT ACTIVITIES OF SUB-AREA 4.1

- To implement more effective approaches in the national education and research policy issues.
- To apply more systematic techniques in collecting information about TUT staff members participation in social development.
- To place efforts to forming opinion leaders in all TUT activity areas.
- To involve more alumni in image building of university.

4.2 IN-SERVICE TRAINING AND OTHER EDUCATIONAL ACTIVITIES FOR THE GENERAL PUBLIC

4.2.1 LIFELONG LEARNING AT TUT

Organisation of lifelong learning at TUT arises from [the Estonian Lifelong Learning Strategy 2020](#) that regards everyone as a learner – children, young people as well as adults incl. seniors.

Legislation on continuing education management is accessible in TUT document register and on the [TUT website](#). Principles of organisation of TUT continuing education²⁹ are defined in the Regulation of Continuing Education Activities in TUT. Main objectives of continuing education are set forth in the [TUT SP: TUT Academic Policies](#) specifies directions and expected results of continuing education. Coordinated by OU, a two-year consolidated activity plan is prepared to realise the objectives set forth. The plan is considered at OU Council and approved by the Vice-Rector for Academic Affairs (see [MSM](#)).

Continuing education curricula are prepared taking into account feedback from the stakeholders. On the basis of the curricula, scheduled training programmes and courses are tailored. Topicality of the curricula and sales potentials of course programmes are subject to periodical evaluation and amendments are introduced consistent with market demand or special queries of the subscriber.

Yearly Report of Continuing Education Activities is prepared. It contains analysis of the objectives in the area and performance indicators, major developments and dynamics of performance indicators. Important developments are also reflected in the Teaching and Learning Annual Report for an A/Y.

Effectiveness of continuing education activities is monitored by the OU Council whose function is to present proposals concerning strategic decision-making in the area to the management.

FULFILMENT OF LIFELONG LEARNING PERFORMANCE INDICATORS

• Participants in continuing education

Objective 2015: to increase the number of participants up to 13 000

To ensure opportunities for continuing education in all broad groups of education at TUT and diversify lifelong learning, the following activities to achieve higher performance have been introduced:

- To map continuing education-related development activities and select support services offered by OU, meetings are arranged with key persons of continuing education in faculties/institutions; discussions address quality management related issues arising from state requirements and from quality criteria prepared by Estonian Academic Continuing Education Cooperation Network.
- Continuing education curricula are prepared in cooperation with the representatives of stakeholders.
- Communication and marketing activity is target group-based. [Website for continuing education clients](#) is available to offer continuing education to diverse target groups by broad groups of education. Information about the courses is available in the TUT calendar of continuing education courses. Subscription form to pre-order courses or to indicate a training need is available on the webpage.
- Learners in lifelong education are supported by study and career counsellors.
- Continuing education information system, created as part of SIS, is in the final stage of piloting.

As a result of activities implemented, by the end of 2013, the number of continuing education curricula had grown from 289 in 2009 to 476 and the number of courses from 440 to 748. As compared to 2009, the number of learners doubled (Table 7). From 2012, each faculty and college at TUT has designed at least one continuing education course based on the continuing education curriculum. In 2013, 4046 TUT certificates were issued to graduates.

²⁹ Continuing education is work-related, pre-university or informal study based on continuing education curricula and degree level study-related continuing education, i.e. open studies based on the individual study plan composed of degree level subjects.

Table 7 Performance indicators of continuing education 2009–2013

Year reported	Continuing education learners' total	Continuing education under continuing education curricula				Continuing education under degree curriculum i.e. open studies		Income of continuing education (mln €)
		Continuing education curricula	Courses	Total volume in academic hours	Continuing education learners	Open learners	Credits	
2009	9 521	289	440	13 425	8 346	1 175	17 342	1.885
2010	9 990	313	459	16 969	8 817	1 173	16 229	1.841
2011	15 698	411	574	24 729	14 617	1 081	14 007	1.788
2012	16 388	452	641	33 750	15 188	1 200	15 930	2.043
2013	19 220	476	748	28 491	16 696	2 524 ³⁰	29 685 ³¹	2.363

Source: Report on continuing education

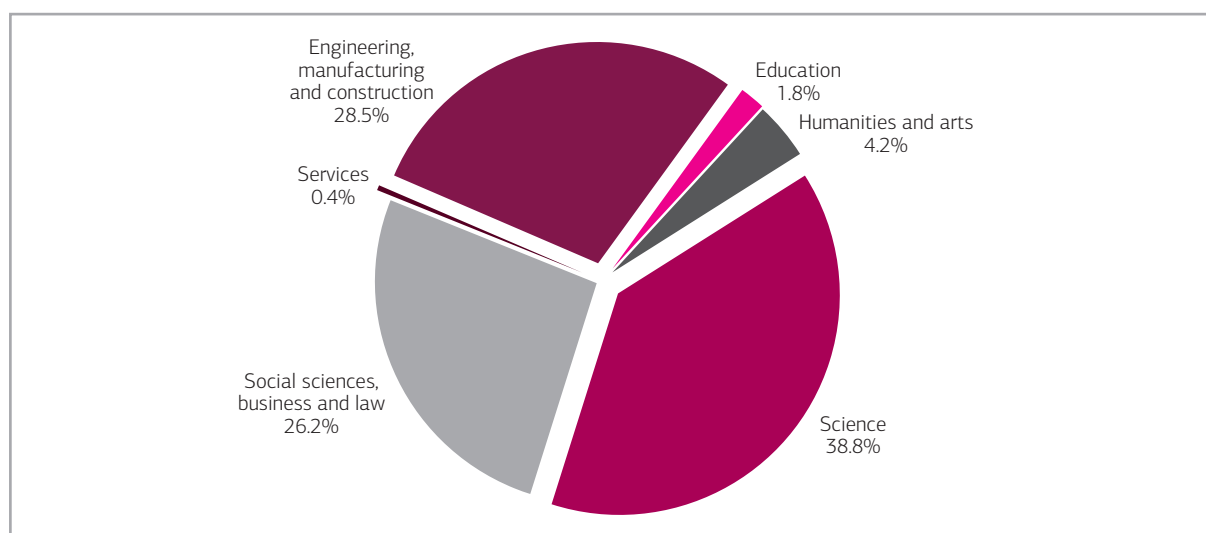


Figure 39 Participants in work-related (specialised) continuing education by broad groups of education (ISCED 1997), 2013

In 2013, 29 685 ECPs were declared through open studies, out of which 4 893 ECPs were declared by the students for repeat performance. 1 438 different degree level courses were taken. The option of open studies selected by adult learners to improve specialised knowledge is on a consistent rise. In connection with the implementation of the education reform, the number of those continuing education learners who failed to pass the threshold level of admission and/or appeared outside the admission quota and who at the same time wished to begin study promptly to be prepared for the competition in the next admission period has increased.

• Income of continuing education

Objective 2015: monetary volume of continuing education is at least 2.6 mln €

Half of the income of continuing education³² is composed of income from the participants and enterprises. Increase in learner figures in continuing education and provision of flexible study opportunities have enabled continuous growth of the total capacity of continuing education (Table 8).

³⁰ According to the Higher Education Reform, from the autumn semester 2013, also learners in free study repeatedly declaring degree level subjects are listed.

³¹ Incl. repeatedly declared credit point capacity 4 893 ECP.

³² Income of continuous education is composed of income from learners and enterprises, income from open studies and income from EU projects and contracts

Table 8 Dynamics of continuing education income by types of income (mln €)

Year reported	Income from continuing education learners and enterprises	Income from open studies	Income from EU projects and contracts	Total income (mln €)
2009	0.908	0.543	0.435	1.885
2010	0.991	0.415	0.435	1.841
2011	0.712	0.477	0.598	1.788
2012	1.213	0.501	0.329	2.043
2013	1.221	0.807	0.335	2.363

Source: Report on continuing education

The considerable increase in the share of income from open studies in 2013 is explained primarily by the changes that accompanied the higher education reform (high threshold for student candidates, strict student load requirements and fewer flexible study opportunities in the degree level studies). More learners are choosing open studies as a flexible instrument for self-improvement and to take degree level courses under a suitable load.

- **Preparation of student candidates**

Objective 2015: participant figure in Technology School and preparatory courses is increasing

To promote school student interest in natural and engineering sciences and find motivated student candidates, TUT is offering continuing education and training activities to school students and teachers. New courses are developed to raise interest in STEM and enhance knowledge of exact and natural sciences.

TUT Technology School (established in 2005) encourages educational activities to school students that popularise natural and exact sciences and introduce TUT study programmes. Courses and technology camps of the Technology School are prepared and implemented by TUT teaching staff, alumni and students in cooperation with OU. In the frame of the Technology School elective courses are taught at TUT partner schools. Cooperation with schools is coordinated by MCO. Workshops, short-term training and marketing lectures are provided also by Mektory, MCO and faculties/colleges.

Preparatory Courses Office promotes knowledge in exact and natural sciences among school students to involve more learners to the field of engineering and technology. Another important objective is to raise interest in those courses. As syllabi in Estonian general education schools are of high capacity, many learners (5th to 12th form) study and practice their mathematics, chemistry, physics at TUT. Workshops are arranged for school students who are keen on mathematics. Also, preparatory courses for state examinations, university entrance tests and basic school finals are offered.

Further information about the activities targeted to student candidate preparation is accessible in the materials of OU Council meeting.

Table 9 Number of participants in Preparatory Courses and Technology School, 2009–2013

Number of participants	2009	2010	2011	2012	2013
Preparatory Courses	1181	1091	1107	762	1072
Technology School	739	756	456	623	1211
TOTAL	1920	1847	1563	1385	2283

In addition to educational activities to school students, TUT offers continuing education to secondary school and vocational school teachers. Teacher education at TUT is arranged mainly by the TUT Estonian Centre for Engineering Pedagogy in cooperation with OU and Education Technology Centre.

4.2.2 PLANNING OF CONTINUING EDUCATION

Employers' needs for personnel training are analysed in cooperation with professional societies. The analysis is based on the labour force analysis of Ministry of Economic Affairs and Communications. Due to high costs, TUT is not conducting research on field specific training needs. Training needs are identified from the analyses made by state, professional societies, stakeholder focus groups, and expert work.

Continuing education curricula are prepared taking into account employers' needs, training and re-training needs of specialists and information from the professional societies. New curricula are initiated, depending on the quantity of queries in the broader area and availability of competence. To extend opportunities for continuing education and re-training and ensure individual training needs, continuing education is offered in the form of open studies, through special study plans composed of degree level subjects.

Curricula are subject to improvement and further elaboration arising from feedback from different target groups (participants, employers). If possible, preferences of target groups are taken into account in scheduling and planning of study methods. Longer courses are cycle- or module-based and study materials are available on the course webpage. Larger capacity courses can be passed on single module/subject basis as well as within the whole curricular period.

Higher capacity curricula are linked to professional standards created in EstQF (3-8 qualification levels) based on the European Qualifications Framework for Lifelong Learning (EQF). Of the faculties, more continuing education curricula consistent with the professional standards are offered by civil engineering, power engineering and economics and business administration and TUT Virumaa College.

In cooperation with Estonian universities in public law, in the framework of the project "Quality and diversified continuing education in university cooperation" Quality System of Continuing Education Studies has been elaborated that contains a self-evaluation model based on EFQM, principles and areas of assessment and principles of organisation of individual and common self-evaluation. The model of self-evaluation is being piloted in the SUs that conduct continuing education.

4.2.3 SATISFACTION SURVEYS AMONG CONTINUING EDUCATION PARTICIPANTS

An essential part of the quality system of continuing education is systematic collection of feedback from the participants and acting accordingly in order to improve education in the area and to further relevant activities. Feedback from the participants is collected as follows:

- **Feedback from participants in writing.** This mode of evaluation is applied in all courses.
- **Review by the lecturer responsible for the course programme, lecturers involved and the coordinator,** is conducted primarily after completion of the course programme, focus is on feedback collected from lecturers' discussions with the participants, and lecturers' self-evaluation.
- **Focus group of participants and lecturers.** This mode is applied in case of longer courses (more than 4 days). Participant feedback concerns course programme structure, relevance of topics, general organisation. Focus is on the determination of further needs for continuing education, which frequently serves for preparation of further course programmes.
- **Evaluation of impact of the course programme on work performance after completion of the programme.** This mode is applied to course programmes as part of subscribed programmes and personnel development programmes of enterprises. In the discussions with personnel and training managers, programme performance is evaluated and further training needs are specified. Evaluations of course programmes conducted in the framework of EU projects supporting labour market and work life address the impact of the programmes completed on starting work or work performance.

General evaluation of the quality of continuing education activities, applicable after a longer period, addresses feedback and needs for improvement on the institutional level. Previous general evaluation covering continuing education courses was conducted in 2013. Results: topicality of courses (high rather than ... 40.5%, very high 54.8% of responders), quality of course content (high rather than ... 47.6%, very high 40.5%), organisation of courses (high rather than... 33.3%, very high 59.5%). Evaluation concerning TUT lecturers' professionalism was also high. 64.3% of responders regarded them very professional. Indicated among areas that need improvement were: to simplify selection of a suitable cooperation partner within TUT, to increase visibility of continuing education information and to promote awareness of the university on the continuing education market.

STRENGTHS OF SUB-AREA 4.2

- Continuing education curricula are prepared arising from employers' needs for training of personnel.
- The number of continuing education participants and the income of continuing education have increased.
- An integral image of lifelong learning and relevant marketing methods have improved.
- The information system of the continuing education system has been created.
- The quality system of continuing education has been elaborated.

IMPROVEMENT ACTIVITIES OF SUB-AREA 4.2

- To create a system that enables better linking of the continuing education curricula with professional standards; to continue development of the continuing education information system.
- To improve target group-based communication through social and communication channels.
- To further the area of quality assessment (broad perspective evaluation of the impact of continuing education activities on work-related performance).

4.3 OTHER PUBLIC-ORIENTED ACTIVITIES

4.3.1 PUBLIC-ORIENTED ACTIVITIES AND CONTRIBUTION TO THE ENHANCEMENT OF REGIONAL WELFARE

Objectives of public-oriented activities/services are defined in the TUT SP, activity area strategies (Strategy for Provision Education, M&C Strategy, SP of TUT Library etc.), as well as in the source documents of amateur art organisations (Statutes of NPO TUT Culture Centre, Statutes of TUT Student Body etc.).

TUT has mapped and classified ~20 public-oriented activities/services (see [MSM](#)) from school students to seniors: Library, [Museum](#), TUT Press, exhibitions, sports facilities, concerts, alumni and reunion events, Mektory, events targeted to school students and young technology-minded learners (preparatory courses, hobby groups, workshops, [Robotex](#) etc.), programmes targeted to seniors (3rd Youth People's University), accommodation, rent of rooms for conferences and seminars. Rooms are provided to over 40 amateur art organisations who are active at TUT. These include several high-level choirs (TUT [Academic Male Choir](#), [TUT Chamber Choir](#) etc.), folk-dance ensemble, big band, brass orchestra, Film Club etc. who are engaging wider public and TUT members in their activities and are offering events oriented to wider public (concerts, film shows etc.). Major ball game (basketball, volleyball etc.) teams of TUT are represented in the Estonian high league and the university supports top sports. TUT holds several European and world champions and Olympic gold medalists.

Major contribution to regional welfare is made by TUT Library. The library has a readership of over 33 000, 51% of whom come from outside TUT community. In 2013 daily library visits accounted for ~900. Internationalisation of library readership is progressing, in 2013 library visitors came from more than 70 countries.

Exhibitions at TUT Museum popularise engineering and technological sciences and TUT study programmes.

[TUT Educational Advising Centre "Education USA"](#) offers free first advising, public lectures and consultations about study opportunities in USA.

[Mektory](#) laboratories and studios provide innovative study and work environment for children, students and grownups. Facilities are open to enterprises to conduct product and business development projects. Full-package conference service is also offered. During their early 4-month period, Mektory has hosted over 11 000 visitors.

TUT Observatory organises excursions (by pre-registration) to people interested and coordinates the regular activities of an interest group. Both theoretical and practical approaches are pursued.

TUT Sports Hall offers free outdoor facilities for basketball and volleyball; paid indoor facilities are also available at fixed prices.

TUT regional colleges contribute to the development of the region through provision of education and R&D as well by the Competence Centres operating there ([Oil Shale Competence Centre](#), [Small Craft Competence Centre](#)).

Provision of these activities/services is not centrally coordinated since the content, competence, directions, clients/target groups vary a great deal. Each member of the management team is responsible for service provision in their activity area.

Provision of services indicated in the TUT SP and area strategies is evaluated yearly by TUT Strategy Committee (academic SU performance reviewed once every 2–3 years) and proposals are made to SUs and the TUT Council for improvements/amendments of the SP. SUs evaluate yearly the implementation of the activity plan and prepare improvement activities for the next year.

STRENGTHS OF SUB-AREA 4.3

- The number of diverse events oriented to different interest and age groups at the same time popularising university education and engineering and technological sciences is impressive.
- Legal persons offering accommodation services, sports and cultural activities have been established.
- In addition to membership, sports and cultural unions include alumni and other interested people.
- TUT Library, Sports Hall, Observatory, Museum, Mektory and other facilities are open to everybody interested.
- Facilities are available to help organise different domestic and international events.
- Events organised by TUT Student Body are popular among young people.
- University-enterprise (incl. students) contact events have been successful.

IMPROVEMENT ACTIVITIES OF SUB-AREA 4.3

- To elaborate and to plan a more systematic public-oriented service system for service provision.
- To consider development of a public-oriented service strategy.



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