

ASSESSMENT REPORT FOR INSTITUTIONAL ACCREDITATION

Institution: Tallinna Tehnikaülikool (*Tallinn University of Technology*)

Assessment committee:

Geoffrey W. Chase – Chair; San Diego State University, Dean, USA

Muzio M. Gola – Turin Technical University, Vice-Rector, Italy

Alex-N. Eberle – University of Basel, former Vice-Rector for Development and Planning, Switzerland

Andreas Moesgaard Christiansen – Technical University of Denmark, student, Denmark

Ott Pärna – Estonian Investment Corporation Ltd., Estonia

Paul Rullmann – Delft University of Technology, former Vice-President of Education and Operations, Netherlands

Coordinator: Liia Lauri

Dates of the assessment visit: 22 – 24 October 2014

Assessment committee sent the preliminary report to EKKA: 03.12.2014

Assessment committee received the comments of the institution under accreditation: 15.12.2014

Assessment committee approved the final version of component assessment with 6 votes in favour and 0 votes against.

Date: 18.12.2014

I Summary of the assessment:

	conforms to requirements	partially conforms to requirements	does not conform to requirements	worthy of recognition
Organisational management and performance	x			
Teaching and learning	x			
RDC	x			
Service to society	x			

Comments:

The assessment team was very pleased to have been invited to take part in the accreditation process for TUT. The University treated the assessment team very well, and had many questions answered. The atmosphere at the University is one of openness and collaboration and that extended to how the team was received. As noted in the report, the University has made much progress, and it has adopted very ambitious goals. The assessment team provides their commendations, recommendations, and questions in the spirit that these will assist TUT as it continues to grow and increase its effectiveness.

Commendations:

- The assessment committee was impressed with the degree to which TUT has set ambitious, shared goals in its strategic plan. There is strong consensus in the TUT community that the University serves students and society well. Also notable is the degree to which there is a deep sense of commitment and purpose at TUT, and a sense of mission that derives from a connection to and support for Estonian society in general. Clearly, staff, administrators, and others feel a sense of purpose at TUT, and they share a belief that their work matters not just for the University but also for Estonia in general.

- Support for students is impressive. The TUT campus provides both access to students who have particular challenges, and also programs that assist students as they seek internships and career opportunities.
- The assessment committee also applauds TUT for its commitment to internationalization. This emphasis is being supported at all levels—by staff, students, administrators—and is broadly conceived not only to bring foreign scholars and students to campus, but also to provide opportunities for current members of the University to travel and study abroad.
- TUT has done a good job of building a remarkable campus in a few short years during a time when the global recession made funding unstable and challenging. The buildings, facilities, and equipment are extraordinary and provide excellent teaching, learning and research opportunities.
- The assessment committee also congratulates the University for its entrepreneurial spirit and endeavors, which have led to fruitful collaborations with business and industry and the development of Mektory, which serves not only students at TUT, but also serves as an inspiration and resource for school-aged children and business professionals in Estonia. Mektory provides an excellent site from which interdisciplinary collaboration and innovative projects within the University and more broadly can be developed.
- In Estonia, securing research money is a highly competitive process, and these funds provide more than eighty percent of TUT's research funding. In spite of this heavy competition, TUT did remarkably well. For example, TUT successfully acquired State funding as well as attracted European funding in contract research. At the same time this makes clear how crucial it is to professionalize the funding strategy.

Recommendations:

- Clarify, articulate, and support a balance between teaching and research and continue to focus on developing budgetary support that advances student success—levels of achievement and time to graduation—and ensures the University can accomplish its goals in terms of securing funding for research and attracting high quality research faculty.
- Create centers of excellence or extend interdisciplinary teams focused on both teaching and research among staff and students.
- Enhance focus on student success, including completion to degree and high levels of learning at all levels including baccalaureate, masters, and the doctorate.

- Increase internationalization through adopting and learning from student success best practices of foreign institutions.
- Continue building support programs for students at all levels of the curriculum.

II Assessment areas and sub-areas

1 ORGANISATIONAL MANAGEMENT AND PERFORMANCE

Comments:

Tallinn University of Technology (TUT) is the only technical university in Estonia. Although the emphasis is on technology, TUT has a broad portfolio. In addition to Engineering Studies and Natural Sciences, there is a school for Economics and Business Administration and a Faculty of Social Sciences. The center of the university is the University Campus in Tallinn. The university has regional colleges in Tartu, Kuressaare, Tallinn and Virumaa and several research institutes (on Cybernetics, Geology, Marine Systems, Technomedium). Over the past few years TUT put enormous effort in modernizing buildings and facilities and turning it into a campus, with student housing facilities for more than 2,000 students. This accreditation seems to come at the right moment in time.

In September 2014, a new law realigned the overall governing structure of TUT. Beginning in January 2015, the Board of Governors will have final responsibility for the University and the Board will serve as the intermediary between society and University. This will facilitate communication between TUT and all of its stakeholders as well as with several boards through which they engage with ‘the outside world.’ All of these Boards—The Board of Governors, an Advisory Board, and an International Advisory Board—meet regularly with the Rector.

TUT is also housed on a new state-of-the-art campus that has both new and restored buildings, up to date facilities, and student houses. Being together in one location facilitates multidisciplinary contacts and brings new dynamics to the University. Now that the basics of governing structure and campus facilities have been achieved, TUT faces new challenges. While it wants to become a world-class research university, Estonian student enrolment is decreasing, the global recession persists, and it may be difficult to attract top researchers from throughout the world. The assessment committee, however, is confident that TUT is stable enough and sufficiently in control of the core processes of the organisation to cope with these challenges.

After meeting with management, staff and students, the general impression of TUT by the review committee is extremely positive. We met employees and students who were competent, involved, proud and ambitious and at the same time had enough self-awareness to acknowledge both the opportunities and challenges they face.

1.1 General management	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
<p>Requirements:</p> <p><i>A higher education institution has defined its role in the Estonian society.</i></p> <p><i>The development plan and the related action plans of a higher education institution arise from the concrete purposes that are built on its mission, vision and core values, and that consider the country's priorities and society's expectations.</i></p> <p><i>Key results of a higher education institution have been defined.</i></p> <p><i>The leadership of a higher education institution conducts the preparation and implementation of development and action plans and includes the members and other stakeholders in this work.</i></p> <p><i>Liability at all management levels has been defined and described, and it supports the achievement of institutional purposes and the coherent performance of core processes.</i></p> <p><i>Internal and external communications of a higher education institution (including marketing and image building) are purposeful and managed.</i></p>								
<p>The University has a clearly defined mission, described by one of the Vice-Rectors as creating “a better place in the world for Estonia.”</p> <p>TUT set concrete goals for how its students can engage in student success activities that will create well-rounded, high-achieving students who will be successful candidates for graduate studies or top-positions in the professional workforce and who will be exemplary global citizens.</p> <p>TUT seeks to 1) provide internationally high-ranked research and quality research-based education; and 2) create a new generation of engineers who contribute to the spirit and quality of an engineering culture in Estonia that supports sustainable development and the growth of national welfare.</p> <p>The University systematically approaches its challenges through the creation of strategic plans, which are synchronized across the campus. Plans include: a general strategic plan, and strategic plans per structural unit, for research, for provision of education, for internationalization and innovation, for personnel and for information technology strategy.</p>								

The self-assessment report gives a good overview of strengths and weaknesses on several themes and organisational areas. It shows that the university is well aware of its liabilities and knows how to handle to overcome those that are in its power to influence.

External communication is well looked after and well managed (the website, newsletters, documents). TUT-style is easy to recognize. The international branding is a best practice for other Nordic universities. Internally there is a constant stream of communication and information also involving students (social media, news-blogs) that is more and more bilingual or in English.

Commendations:

- University priorities are shared by the Rectors, Vice-Rectors, deans and directors: becoming a top-research university; improving teaching; learning to attract more students; fulfilling a role in society via regional colleges and connecting with companies—The biggest challenge – getting money to finance all the plans – is also clear to everyone. TUT regularly and formally meets to discuss whether The University’s activities are in alignment with the Strategic Plan.
- There is a genuine, open and collaborative climate at TUT and a willingness to hear and understand from the campus community. The management welcomes feedback, and students who we interviewed echoed this sentiment. The hierarchy is not overbearing. Therefore it is easy for stakeholders to offer feedback.
- Management, employees, students and, staff are proud of what TUT has accomplished so far, and, together, they share these student success goals.
- Students understand and support TUT’s mission and values.
- External communication is well looked after and well managed (the website, newsletters, documents). TUT-style is easy to recognize. The international branding is a best practice for other Nordic universities. Internally there is a constant stream of communication and information also involving students (social media, news-blogs) that is more and more bilingual or in English.
- Industry is pleased with TUT graduates. Also, alumni are happy with the competencies they acquired at TUT; and students are both content with the programs and feel that that the administration listens to their comments. Finally, employees like their work and the working conditions. In the last survey employees rated above 8 on a 10-point scale on average. The results are discussed in the organisation and special attention is paid to areas that rate lower.

Recommendations:

- Some people from the leadership team at TUT expressed their dream that one day the University would be among the top universities globally. We support this ambition and encourage the University to incorporate goals such as this into their strategic plans and to communicate these aims broadly. The new ambition could perhaps be linked with both, the demand set to the new management team to be appointed in 2015 as well as to the 100th anniversary of the University on 2018.
- Fine-tune the mission to guide faculty and staff about the degree to which programs and policies should be comprehensive or specialized.
- Increase international benchmarking and best practice learning applied in case the University wants to become an internationally known high-achiever University (Mektory is a good example of how to apply international best-practice learning).
- Create schemes and approaches for administrators, faculty and staff to streamline procedures and commitments.
- Identify university branding and ensure consistency in all initiatives.

Areas of Concern:

- While TUT's mission describes what it would like to become and the type of students it would like to develop, the mission does not detail what sort of programs and policies will facilitate achieving the mission.
- Getting enough resources for all the plans (research, new young academic staff, investing in online education).
- The heavy competition in Estonia for research money; the outcome is insecure and 76% of the structural costs are financed from the activity support.
- How will the University enable stable growth, and continue to attract top scientists and students?

1.2 Personnel management	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
<p>Requirements:</p> <p><i>The principles and procedures for employee recruitment and development arise from the objectives of the development plan of a higher education institution, and ensure academic sustainability.</i></p> <p><i>When selecting, appointing and evaluating members of the academic staff, their past activities (teaching, RDC, student feedback, etc.) are taken into account in a balanced way.</i></p> <p><i>The principles of remuneration and motivation of employees are clearly defined, available to all employees, and implemented.</i></p> <p><i>Employee satisfaction with the management, working conditions, flow of information, etc., is regularly surveyed and the results used in improvement activities.</i></p> <p><i>Employees participate in international mobility programmes, cooperation projects, networks, etc.</i></p> <p><i>Employees base their activities on principles of academic ethics.</i></p>								
<p>The Strategic Plan and the Personnel Plan outline the desire to draw quality academic staff from both inside and outside Estonia. Specifically, an already accomplished goal is to have a campus that comprises 10% international staff in 2015. Another goal is to attract young staff and doctoral students.</p> <p>When new academic staff members are appointed, their teaching and/or research experiences are taken into account. Teacher-candidates give an open lecture. Employees have a yearly evaluation, in which their results, their presentations, training and the student-evaluations of their teaching are discussed. The evaluations are documented and signed. They are important in case of re-election.</p> <p>Conditions of remuneration are provided in “Salary Rules of TUT.” Employee payments are reviewed at least once per year, jointly with the TUT Trade Union. Remuneration is in line with state legislation and TUT Collective Agreement. Competitive remuneration is an important tool in attracting new young staff.</p> <p>Satisfaction with remuneration and acknowledgement is surveyed regularly. Satisfaction has increased over the years. Results of the surveys are used to update guidelines and rules. Every year satisfaction with management, work conditions and communication is reviewed. In general the outcomes are above 8 on a 10-point scale. The outcomes are used to improve personnel</p>								

management.

Academic staff are stimulated to participate in international networks, to go to conferences and training programs and deliver lectures in partner universities. Use is made of the Erasmus program and employees are eligible to take a sabbatical leave every 5 years.

TUT has a Code of Academic Ethics that provides guidelines for staff and students. An Academic Court resolves internal academic disputes. Students are trained in the ethic aspects of scientific work. Plagiarism software is used to control documents. In the meeting with staff and students the review committee had the impression that staff and students are well aware of the ethics, rules, and regulations, and act accordingly.

Commendations:

- There is a good management information system on personnel and a good overview based on actual statistics.
- The approach for recruiting, evaluating, training and supporting employees is very structured.
- Feedback from students (on teaching, on English for instance) is seriously used in re-election-processes.
- In interviews with staff and employees at the University, the assessment committee heard that Personnel Management is valued and trusted.
- Salaries for academics are relatively high compared to other Estonian universities.

Recommendations:

- Give doctoral students and postdocs a solid career perspective.
- Make clear who is permanent and who is not; and help those who are not (a) to become permanent or (b) get a career elsewhere.
- Improve international mobility for students and staff both to bring individuals to TUT, and also to increase study and research abroad opportunities.
- Some fields need restructuring and in some cases there is a demographic pattern—a larger number of older researchers than younger and middle-aged researchers—that needs to be addressed. Funds will need to be made available to recruit highly

qualified staff as an older generation retires.

- Provide jobs within university for students since other positions may not be available.

Areas of Concern:

- The University should track how many employees take sabbaticals, and the effectiveness of sabbatical leaves in terms of research productivity.

1.3 Management of financial resources and infrastructure	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
---	---------------------------------	---	---	--	---	--	------------------------------	--

Requirements:

The allocation of financial resources of a higher education institution as well as the administration and development of infrastructure are economically feasible, and are based on the objectives of the development plan of an institution of higher education and national priorities (except private institutions).

A higher education institution uses information systems that support its management and the coherent performance of its core processes.

The working conditions of the staff, and the learning and RDC conditions of students (library, studios, workshops, laboratories, etc.) meet the needs arising from the specifics of an institution of higher education and the expectations of members.

The policies of TUT for internal resource allocation are defined in the TUT Budget Rules. They concern allocations for structural units, for the student body, and for the capital budget. Approximately 40% of TUT’s finance is project-based. 76% of the university’s structural costs, including those for teaching and learning are financed from the activity support. In order to cope within this framework solid financial management is an absolute necessity. So far TUT has managed successfully, given the fact that within the financial constraints an extensive renovation and building program has been realized.

TUT maintains information systems on all central management areas; student information, accounting and personal information, and document management. The accounting management system facilitates real time budget overview, which supports direct financial *control*.

Because of the renovation and extension of buildings and facilities that took place over the past years, supported by European Union funding, TUT has evolved into a modern campus. The buildings are in good shape; and, interiors are well designed, tasteful, and equipped with modern instruments and tools. TUT has good facilities as well: a Library, a Sports hall, a Student House for the student organizations, a Kindergarten for the children of employees, and housing accommodation for at least 2000 students (national as well as international).

Commendations:

- Despite the recession, TUT has in recent years undergone a significant transformation, which has led to new buildings, student housing, establishing a central campus, and providing up to date facilities.
- TUT maintains information systems on all central management areas: student information, accounting and personnel information, and document management.
- IT facilities for administration are adequate. Every budget unit has real-time overview and there is a clear system for allocating budgets.
- Most of the support services are outsourced. One area in which cost-reduction is possible is with energy and a smart grid-plan is being developed.

Recommendations:

- In Estonia, securing research money is a highly competitive process, and it is likely to become more so. While currently, these funds provide more than eighty percent of TUT's research funding, that may change. Thus, although developing funding support is heavy and TUT did remarkably well. They will need to strategize and prioritize about funding models in the future.

Areas of Concern:

The insecure financial situation; partly because of the recession, partly because of the political uncertainties

2 TEACHING AND LEARNING

Comments:

The Self Assessment Report strikes a good balance between readability, conciseness, transmission of essential information, and support of statements with appropriate references. In this respect, the direct links to documents and websites are a commendable solution: they allow the sources (in fact, most of them, with some exceptions) to be directly inspected by the evaluator, thus providing adequate confidence that the whole Self Assessment Report is essentially aimed at documenting the statements. All links opened the expected website or document, and no incident in this regards occurred during the investigations on the Self Assessment Report.

2.1 Effectiveness of teaching and learning, and formation of the student body	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
--	---------------------------------	---	---	--	---	--	------------------------------	--

Requirements:

A higher education institution has defined its educational objectives and measures their implementation.
A higher education institution educates students so they are nationally and internationally competitive.
The number of student places is planned in accordance with the social need and the potentials and purposes of an institution of higher education.
The admission rules are consistent with the mission and purposes of an institution of higher education and support the formation of a motivated student body.
Students are provided with opportunities to study at a higher education institution regardless of any special needs.

TUT aims to increase its student share in the overall Estonian student body and to compose a stronger student body with higher motivation. Additionally, they are tracking numbers to record and reduce student dropouts, and to raise graduation effectiveness and graduation efficiency: however, as noted below, they will need to continue tracking students to ensure that all students are successful.

The Self Assessment Report focuses on ensuring graduates’ competitiveness, on enhancing the quality of education offered, on

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. Additionally, these goals are outlined in the online document [Strategy for Provision of Education 2012-2015](#).

The Self Assessment Report notes that: “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.” It is also noted that because “75% of TUT programs and approximately 62% of students are enrolled in the STEM area, priority in student place planning is given to that broader area” and “Different area-related studies (e.g. IT sector surveys concerning labor 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”. TUT also evaluates 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.

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. While these strategies may increase the number of students from Estonia, it will be important over time to evaluate and assess the success—time to completion and level of achievement—in relation to their peers.

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 APEL (Accreditation of prior and experiential learning) opportunities.

In meetings with teaching staff of TUT Tallinn College, it was clear that teachers at the College know the students, know which students need additional support, and also offer to meet with them. Students in need are provided financial help, or they can demand psychological counselling, and career counselling. Moreover there are information seminars on career counselling as well as workshops on how to write a CV, or how to manage an interview.

Commendations:

- The University demonstrates that it has set targets and goals relative to enrolment, and it tracks data to determine if they are meeting the targets they have set.
- TUT demonstrates a sustained focus on internationalisation (more than 1000 international students, 80 nationalities; 10% of the staff); international and Estonian students live together on campus, thus facilitating the interaction of Estonian and international students. The International Office does a good job.
- The University provides support in many ways for students, whether they are disabled, in financial need, ill, or have family-problems. This is a case in which the University represents best practices—not only in Estonia but internationally—for their work in this area.

Recommendations:

- The University should implement a tracking system for all students that allows them to disaggregate the population by level of preparation so they can determine what preparation levels are necessary for student success, or to develop effective programs aimed at increasing student success for students with lower levels of preparation.
- Efforts are underway to motivate (new) students through freshmen week, tutoring, and mentoring, self-management workshops, special projects, and by reaching out to secondary education. However, as the team notes in 2.3 of this report, more analysis and work needs to be undertaken.

Areas of Concern:

- During interviews and meetings at the University, it became evident that there is a proactive attitude at the highest institutional level for maintaining a strong link between governmental policies and institutional policies concerning the desired (although not realized) planning of student numbers in technological sectors.

2.2 Study program development	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
<p>Requirements: <i>A higher education institution bases its new study programmes on its purposes and the needs of the labour market, and takes into account the strategies of the country and expectations of the society.</i> <i>Development activities related to study programmes are systematic and regular, and different stakeholders are involved in the development of study programmes.</i> <i>Graduate satisfaction with the quality of instruction and employer satisfaction with the quality and suitability to the requirements of the labor market of graduates are surveyed and analysed; the results are considered in the development of study programmes.</i></p>								
<p>New study programs are initiated by academic SUs consistent with input from stakeholders’ feedback, activity area SPs/surveys, and employers’ recommendations. To ensure that new curricula are consistent with TUT’s and with Estonian national strategies and to avoid duplication, since 2012 the evaluation of pre-applications for the opening of a new curriculum is reviewed by the Committee of Preliminary Assessment. The Committee evaluates needs for opening a curriculum, a target group and labour market needs, identified collaboration for planning within the university, and assesses competitive advantages of the new curriculum over the existing. New curricula are subject to expert assessment by employers before approval at the TUT Council. Additionally, curriculum development includes 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. The aim of these reviews is to evaluate needs for offering a curriculum, identifying a target group and labour market needs, to initiate planning within the university, and to assess the competitive advantages of the new curriculum an existing curricula.</p> <p>In meetings with employers, the assessment committee heard several examples of the way in which different stakeholders are involved. Representatives from Real Estate, for example, noted that a committee took into account four main professional standards in real estate. There were follow up meetings and discussiosn with the management board of the Estonian association of real estate managers and Real estate maintenance providers.</p>								

In another instance, representatives of employers and the Estonian association of accounting (approximate name), which has its own advisory board, were asked by the university to provide input. Then employers underlined what is important from their point of view. i.e., the right proportion of knowledge and ability. Both of these examples help fill out a pattern that illustrates TUT's involvement with stake holders.

Feedback from alumni has been collected centrally through surveys since 2000. Surveys are targeted to graduates who completed their studies 1–2 years ago. Evaluations concerning employer satisfaction are collected centrally from 2008. The aim is to evaluate the quality of study programs and graduates from the employers' position as well as its consistency with their expectations. Graduate satisfaction with studies has been surveyed since 2012. Feedback is collected from students who have completed their studies and are about to graduate. The analysis of feedback, implementation of the results and increase in the number of respondents have been 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 "institutional quality Thursdays", and reports are available on the TUT Intranet and website, however, as noted in the recommendations that follow, the assessment team recommends several steps TUT can take to improve on these practices.

Commendations:

- TUT clearly demonstrates its commitment to multiple stakeholders and show that they respond well to societal and professional needs as they consider curriculum development.
- New information and communication technology-related study programs (taught in English) like ICT for Forensics, and Cyber Security program clearly address the needs of the society both in Estonia and internationally.

Recommendations:

The University has set key objectives for 2015 for meeting its goals. These include (1) graduate evaluation of competitiveness and capacity in their function ≥ 4.00 , (2) employer satisfaction with graduate quality ≥ 4.00 , and (3) graduates' satisfaction with TUT studies ≥ 4.00 . These are laudable goals, however, the assessment team also suggests that the University:

- Further develop the feedback system so that it provides more efficient feedback from different stakeholders and includes
 - a) more systematic implementation of the received feedback;
 - b) increasing activeness of response.

- 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.
- Link flexible approaches to amendments or substitution of curricula arising from graduates.
- Implement programs that are informed by the international community as well as by stakeholders in Estonia, in order to attract students from beyond Estonia and abroad.

Areas of Concern:

It will be important for the University to continue to build on efforts to promote interdisciplinary collaboration. In 2010, a Master's study programme in Design and Engineering was launched, which was based on the Aalto model as well as the best practice applied elsewhere in the world. 15 of the 21 new study programmes launched since 2009 are interdisciplinary. A comprehensive project has been started for enhancing professional IT studies throughout all the study programmes. The objective in the following years is to decrease duplication and improve cooperation between the departments. A motivation system supporting cooperation is under preparation. Innovation and Business Centre Mektory is another excellent example of the kinds of initiatives that promote integration.

2.3 Student academic progress and student assessment	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
---	---------------------------------	---	---	--	---	--	------------------------------	--

Requirements:

Student academic progress is monitored and supported.

Student assessment supports learning and is in line with learning outcomes.

A higher education institution has an effective system for taking account of prior learning and work experience.



Monitoring activities of student academic progress is taking place. Direct monitoring is implemented first on the faculty/college level: student attendance, academic progress in subjects, individual counselling and cooperation with teaching staff. Student support is described in the context of freshmen support and of dropout reduction, two aspects that are interconnected since they concern the same student group.

During the Meeting with representatives of Office of Academic Affairs (admission, counselling, development and quality unit), the team learned that there are different understandings, among the academics, on how to implement the principles about correctly defining learning outcomes. This extends to the problem of assessing student achievement. Meetings are underway about assessment methods and criteria. Academic staff is asking more and more help from the office. The office is presently helping faculty to make sure that learning outcomes are aligned with the way they assess.

As noted in the Academic Policies of Tallinn University of Technology, the general rules for “Accreditation of Prior and Experiential Learning” are set. During the meeting with representatives of Office of Academic Affairs (admission, counselling, development and quality unit) “TUT has an engagement and exchanges with other institutions to develop methods and initiatives. For instance, recently the Head of development and quality unit was coordinating a project on experiential learning (prior learning), which was important to learn of to manage the recognition of prior learning. As noted in the Self Assessment Report:

- APEL performance process is regulated by the Procedure and Terms and Conditions for the Recognition of Prior Learning, present on the **Policies and Rules** website and
- The TUT APEL website contains instructions explaining the process, application forms as well as contacts, incl. in English and Russian.

Recommendations:

- The University should focus more strongly on student learning outcome assessment and ensure that teaching staff regularly reviews direct measures of student work.
- Also, in terms of student assessment, the team recommends that the University
 - Work cooperatively with other international universities to identify best practices for assessing student learning, and

- Establish reports that link level of preparation of incoming students with measures that are indirect (surveys, employment data, time to degree, etc.) and those that are direct (examples of student work, theses, examinations, etc.).

Areas of Concern:

- Although the University acknowledges that the drop out rate for first-year students is higher than desired, the assessment team believes it will be important for the University to take additional steps to impact retention.

2.4 Support processes for learning	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
---	---------------------------------	---	---	--	---	--	------------------------------	--

Requirements:

The organisation of studies creates an opportunity for students to complete their studies within the standard period.

A higher education institution provides students with counselling related to their studies and career.

A higher education institution supports student international mobility.

Modern technical and educational technology resources are used to organise educational activities.

Students are periodically asked for feedback on learning and support processes (the organisation of studies, assessment, counselling, etc.); the results of surveys are taken into account in improvement activities.

The Self Assessment Report provides an honest picture of the “Share of graduates with nominal period in overall graduates.” Number for four academic years range between 37% and 58%. This situation is common to many European universities, where the regulations give student freedom to choose their own pace of achievement.

The Self Assessment Report notes that “Analyses and an activity plan are under way on all study cycles to increase graduation at a nominal period.” The assessment team, however, notes that the University will need to approach graduation rates from a comprehensive perspective.

The counselling system comprises academic counselling, career counselling, welfare facilities and health affairs etc.

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. As already noted above (see 2.1 Req. 5), students in the TUT Tallinn College, spoke about “Psychological counselling (for students and staff), and career counselling,” adding, “These services do work well.”

The Vice-Rector for Academic Affairs noted that TUT is strongly committed to increase internationalisation, and that in 2015 TUT shall have the first international double program. Interest in internationalisation emerged at many points during the visit. These discussions focused on not only incoming (see discussion of 2.1 Req. 5) students and those from TUT studying abroad, but also measures to recruit foreign teachers from international universities. Other discussions involved the retention of international students as a measure to increase the numbers of graduates, especially in technological studies, which would benefit the Estonian society at large and help meet goals outlined in governmental plans.

At the university level, educational technology applications are implemented and the Education Technology Centre provides support. In 2008/09 A/Y the number of e-supported courses were 357, and in 2012/13 the number grew to 851.

A variety of course delivery methods are outlined in the Self Assessment Report.

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. As noted earlier, the Student Union runs in parallel with institutional questionnaires focus groups on the evaluation of courses as a complementary measure. Students note that this system is operating better and better every year.

Commendations:

- The counselling services and support for disabled students is very strong.

Recommendations:

- The assessment team recommends establishing a task force at the University to examine graduation rates and to present annual data related to:
 - Progress of students with remedial needs,
 - An analysis of barriers to persistence (work, financial pressures, mobility, etc.),
 - Student learning, also mentioned elsewhere, and
 - The effectiveness of “high-impact” practices (undergraduate research, service learning, employment on campus, writing intensive courses, study abroad, etc.).
- Also in terms of graduation and achievement data, the assessment team recommends studying models for student achievement that have been developed and successfully implemented at universities in Europe, the United States, and Canada.

Areas of Concern:

- The University aims to be highly ranked internationally, and as the assessment team notes elsewhere in this report, this is a laudable goal. However, the assessment team wishes also to caution that a focus only on rankings can obscure goals around teaching and learning. The team encourages the University to focus on improving the success of its students regardless of the challenges they face rather than on enrolling only select groups of students.

3 RESEARCH, DEVELOPMENT AND/OR OTHER CREATIVE ACTIVITY (RDC)

Comments:

Research, development and other creative activities are on the top of the agenda of TUT: In the University’s vision and strategy, R&D has been defined to be “a university activity of primary importance.” In the past two decades, TUT has indeed achieved a major transformation from the university’s earlier role as a place of formation and training of engineers to the present-day focus of becoming a highly respected technical university on the international ranking scale, doing excellent research and solid teaching at all levels within the wide spectrum of eight faculties, five colleges and four R&D institutions (Institutes of Geology, Cybernetics, Marine System, and Technomedicum). The priorities in R&D for TUT are well documented by the R&D Strategy 2005-2015, the Internationalisation and Innovation Strategy and the prominent consideration of R&D in the Management System Manual. The Rectorate fosters R&D activities in every respect, e.g. by providing sufficient financial means and infrastructure for R&D, by ensuring academic freedom in research and through support of the researchers by the Research Administration Office (RAO) and the Innovation and Business Centre (IBC). The implementation of the priorities set by TUT are even more effectively demonstrated by the modern research buildings and state-of-the art equipment of the TUT campus as well as by the numerous research projects carried out in collaboration with industrial partners. Although the assessment committee judges TUT to be on the right track to reach the ambitious strategic goals defined for 2015, considerable efforts are still required and undoubtedly also more time will be needed to achieve it all.

3.1 RDC effectiveness	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
------------------------------	---------------------------------	---	---	--	---	--	------------------------------	--

Requirements:

A higher education institution has defined its RDC objectives and measures their implementation.
A higher education institution monitors the needs of society and the labor market, and considers them in planning its RDC activities.

Comments:

The RDC objectives are well defined in the R&D Strategy 2005-2015 and in the Internationalisation and Innovation Strategy of TUT. The Estonian “Organisation of Research and Development Act” forms the legal basis for the organisation and implementation of the different R&D activities at the Estonian universities; TUT’s own documents adhere to this Act. The boards of TUT (Rectorate, University Council, Board of Governors) and in particular the Vice Rector for Research and the Vice Rector for Innovation and Internationalisation invest considerable energy into the promotion and implementation of R&D at TUT. The deliverables are well documented by various means, such as the annual TUT Research and Development Reports (2010, 2011, 2012) published on the internet, the Estonian Research Portal (<https://www.etis.ee/index.aspx?lang=en>) as well as by the records of the RAO. For the assessment committee, the data presented on the Estonian Research Portal could only be consulted in an aggregated form; no details of evaluation reports of structural units or subject areas of TUT could be checked (password-protection of this data base).

The major research areas pursued in the individual faculties are well presented in the annual TUT Research and Development Reports and – for a wider public – in the Tallinn University of Technology brochure. The different representatives of TUT appear to monitor the needs of society in the labour market and to fine-tune R&D along these needs. It is difficult for the assessment committee to verify the success of these endeavours during a relatively short visit. However, there are several bodies in Estonia exerting checks and balances to guarantee close control of fulfilment of the needs of society in R&D by individual universities: the Estonian Research and Development Council led by the Prime Minister, the Ministry of Education and Research (through the Research Policy Committee, the Research Competence Council, the Archimedes Foundation, the Estonian Research Council), and Parliament through the Estonian Development Fund. Major contributor to the exchange between TUT and society, i.e. companies, is the TUT Innovation and Business Centre, including Mektory, the “trump card” for TUT with respect to innovation and translational research.

The governance structure for research at the governmental level is also responsible for the evaluation of R&D at the different universities. Currently, this is done along research topics and not by evaluating the individual structural units (faculties, departments) within universities as a whole. Four research areas at TUT have so far been evaluated, all of them positively. The assessment committee appreciates the current advantage for Estonia as a country to obtain a good overview about the state of the art in individual domains of R&D. On the other hand, the performance of structural units of a single university cannot be assessed in this way, and therefore there is no feedback for change or improvement in the organisation of the faculties/departments or for setting the right focus in teaching and intra-faculty research areas. For the longer term, it would be advisable to evaluate every faculty or department of TUT by a peer group in \pm 8-year periods. This will also give a more detailed analysis of the quality of

individual research papers. The assessment committee has had the feeling (without being able to consult all of the 1721 papers published in 2013) that the impact and visibility of some of the research carried out at TUT could be increased. – Quality assessment of doctoral studies will be addressed under # 3.3.

Research teams of TUT participate in seven national (international) centers of excellence, demonstrating international recognition in various fields such as computer sciences, electronic systems and biomedical engineering, chemical biology, nonlinear studies, environmental adaptation, mesosystems, and high-tech materials for sustainable development. In addition, TUT research groups are members, founders or hosts of five competence centers, which link academic partners of TUT, and other universities with industrial partners. These competence centers also produce high-quality R&D.

The Estonian Research Information System (ETIS) centrally collects numerical data from all universities, including TUT. The figures include publications (grouped according to ETIS categories), patents, financial aspects, contracts with companies, spin-offs etc. A fair assessment of the publications originating from TUT by this assessment committee would require detailed analyses of all faculties/departments, with relative (discipline-related) corrections according to international standards; however, this is far beyond the capabilities of this committee and could be the task of future faculty/department evaluations (see above). Briefly, however, with 1721 scientific publications in 2013, TUT has achieved a remarkable publication record, considering the fact that of the ~1150 academic positions at TUT, the number of research staff is less than half of that of the teaching staff. While numbers of publications alone do not reflect quality a review of the of citations of publications per research area by ETIS for Estonian universities as a whole shows increases in many disciplines over the past few years, and this may also be true for the publications originating from TUT. Hence, one may conclude that the quality of publications is on an ascending track. Collaborations with industry are very intensive and also the patent record (15-20 patents granted per year) is very good.

TUT has put considerable efforts into the formation of an international network with 74 partner universities in 33 countries, and it attracts a steadily increasing number of foreign students (see # 2.4) and researchers as well as – though still small in number – of professors from abroad. TUT has established liaison offices in the Silicon Valley and in Shanghai. The internationalisation road map of TUT is ambitious but with enough perseverance, the goals set for 2015 and beyond may be reached. A special note also to the topic of university marketing which is excellent.

An area of concern with respect to research effectiveness is the current structure of the academic staff: 146 professors, 140 associate professors, 248 lecturers/teachers, 76 assistants, 20 lead research scientists, 243 senior research scientists, 204 research scientists, 77 early stage researchers. Of these ~1150 academic positions, fewer than 50% are counted as research staff. Furthermore, >40% are 50 years or older. TUT is well aware of this situation, the reason for this age-distribution lying in the fact

that former academy research institutes (of the Soviet era) with a large number of permanently employed research scientists had to be integrated into the universities some twenty years ago. As it will take another 10-15 years until this imbalance will have been corrected, measures should already be taken now to strengthen research by hiring young scientist at the assistant professor level. TUT should indeed seriously consider introducing the three-level structure of professorial staff, i.e. assistant professors (tenure-track and non-tenure-track), associate professors (existing), professors (existing). Young assistant professors with full independence and good international contacts may become an important pillar for the research output by TUT. They may also be involved in teaching and – because of the small size of their research teams – they will be excellent supervisors for PhD students (see # 3.3).

Commendations:

- A clear and comprehensive R&D strategy; excellent university marketing.
- A broad portfolio of research areas, covered by eight faculties, four specialized institutes and five colleges; participation in seven national/international centers of excellence and five competence centers.
- The research hub: the TUT Innovation and Business Centre, including Mektory.
- Participation in the national platform of ETIS, which monitors research project, publications, researchers and funding.
- Extensive international network for research and teaching with >70 universities in Europe, the Americas, Asia and Australia.
- Good system of monitoring of research, researchers and new funding opportunities.
- Good database for publications on a national basis: Estonian Research System.
- 11% of the research budget comes from contract-research with companies; very high!
- Extensive networks for research, with other universities in EU, with industry.
- Contacts in S.E.-Asia, US.
- A broad portfolio with separate knowledge institutes (Marine, Geology, Cybernetics, Technomedicum) and research in the departments.

<p><u>Recommendations:</u></p> <ul style="list-style-type: none"> • Evaluate structural units (faculties, departments). • Pursue the intentions of the Rectorate to promote good impact and visibility with the publications in all areas of research of TUT (i.e. primarily publications in high-ranking international journals). • Restructure research-staff to make room for young top-talent (not too easy recruiting from within, but in fair competition of inside and outside candidates). In this context, consider the establishment of research groups led by tenure-track and non-tenure-track assistant professors who will have the same independence and status as associate professors and professors. • TUT has achieved success with several of its business projects and partnerships. We encourage TUT to build on these successes and to share them across the University as well as in Mektory. It should be made clear of how the proposals are made, who is responsible for supervision and final quality of them. Knowledge and benchmarking with professional international consultancies, applied research institutes or technology research centers would also be useful for achieving higher success rates. <p><u>Areas of Concern:</u></p> <ul style="list-style-type: none"> • Because of the very competitive R&D-field in Estonia (more than 80% of the TUT R&D budget is competition based), long-term research development in specific areas (which may be of importance for Estonia) may be at risk. • TUT is, when it comes to research funding, very much dependent on the political situation in Estonia; new elections may lead to considerable changes. 							
3.2 RDC resources and support processes	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition
<p>Requirements:</p> <p><i>A higher education institution has an effective RDC support system.</i></p> <p><i>A higher education institution has financial resources needed for RDC development and a strategy that supports their acquisition.</i></p> <p><i>A higher education institution participates in different RDC networks.</i></p> <p><i>RDC infrastructure is being updated and used effectively.</i></p>							

Comments:

Estonia has chosen to provide detailed research information through a national platform, the Estonian Research Portal. This relieves the universities from having to establish their own intra-university databanks. Therefore, RDC support at TUT is partly via the national platform and partly through the relevant offices of TUT. The Research Administration Office (RAO) provides service to researchers through its External Financing Division and its Research Project Division. External funding originates, to a larger part, from EU sources, e.g. Horizon 2020, ERC, COS and others as well as through some regional (Baltic and Nordic) sources. There is also internal funding: institutional research funding, personal research funding, postdoctoral research grants, and baseline funding; all this is coordinated effectively by the RAO. The Innovation and Business Centre (IBC) coordinates the cooperation with domestic and international companies and hence translational research. The TUT Library is a modern institution providing access to the relevant databanks, journals/e-journals etc. and the TUT Computer Cluster offers modern infrastructure and research computing services. The International Relations Office (IRO) supports researchers looking for contacts to researchers of partner universities and promotes international exchange. In the interviews with the various personnel groups, the assessment committee had the impression of a high degree of satisfaction with the relevant support services for research provided by TUT.

The investment of TUT into research infrastructure is impressive: A new campus with modern buildings has been established over the past few years, bringing all structural units of TUT to the same site. This is a huge advantage for the exchange between research groups – in particular for sharing expensive research infrastructure – and this will positively affect research output. For example, the infrastructure in the Faculty of Science or the Mektory (which the assessment committee visited) is excellent and up to the standard of any modern university of technology. Whether this observation would apply to all eight faculties cannot be judged.

According to the statistics in the self-assessment report, the share for R&D of the total budget of TUT (€ 91.4 mio. in 2013) was 38.8 – 41.8 mio. (42.5% - 45.7%, depending on the tables consulted). This large share of competitive and project-based R&D income is remarkable and demonstrates that TUT researchers were particularly successful grant applicants at the EU level and by generating income through project collaborations with industry, the latter being € 4.6 mio. (11% of the R&D budget). About € 9.40 mio. (22.5%) of the R&D budget originated from the Ministry of Education and Research. Although at present TUT is in the comfortable situation of generating a large proportion of the R&D income from external sources, caution is required in the longer-term budget plans as EU structure funds will decrease and the maintenance of the campus infrastructure will consume an increasing percentage of the total budget. It is likely that an even larger share of income will have to be generated through TUT-industry collaborations in the future.

As already mentioned above (see # 3.1), researchers in different fields are very well integrated in international networks, demonstrated by the participation in seven centers of excellence, five competence centers and through numerous collaborations with partner universities at the project level.

Commendations:

- TUT has a very good RDC support system through RAO, IBC, Mektory, and IRO.
- Bringing nearly all of the structural units of TUT to the same campus offers the great advantage of closer collaboration through joint use of research infrastructure and daily exchange between scientists.
- The successful generation by competition of a very large share of the R&D budget is remarkable.
- RAO is very successful in supporting the researchers with their research-proposals (informing them, advising, helping with writing) with a minimum of bureaucracy.

Recommendations:

- Invest in research-based teaching and in the election process for professorial staff.
- Seek out scientist-researchers who have pedagogical competencies, and require a test-lecture.
- Promote research funding from as many sources as possible whereby RAO, IBC, Mektory and IRO will have to play an important role.
- Increase lobbying at the political level to increase Estonian State funding:
 - EU (Horizon 2020, ERC, COST etc.) and other international sources (participation in international networks).
 - Contract research with industry (to be increased).
 - Joint projects with universities and companies in other countries (yielding funds for TUT).

Areas of Concern:

- Not enough state placed positions for the doctoral students.
- Decreasing infrastructure funds by the EU and increasing costs for the maintenance of the TUT campus.

3.3 Student research supervision	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
<p>Requirements:</p> <p><i>A higher education institution includes students of all academic cycles in research, creative or project activity; and systematically surveys student satisfaction with their supervision.</i></p> <p><i>Professionalism, effectiveness and the workload of supervisors are reasonably balanced, which ensures the quality of research papers and positive graduation rates.</i></p> <p><i>Students are guided to recognize plagiarism and to avoid it.</i></p> <p><i>Conditions have been created for admission of international doctoral students and for studies abroad for all doctoral students.</i></p> <p><i>A higher education institution includes recognised foreign scientists in the provision of doctoral studies and the supervision of doctoral theses.</i></p>								
<p>Comments:</p> <p>With the transformation of TUT from a teaching to a research university in the past 20 years and the implementation of the Bologna reform, TUT is now in the process of reforming and strengthening student research supervision and doctoral studies. Students at the level of bachelors and masters studies are generally satisfied with their situation (they appreciate participation in research projects and the supervision). For doctoral students whose project duration is much longer than that for undergraduates, the impression about their situation is mixed: Whereas some of the PhD students are satisfied with progress and supervision of their PhD theses, others complain about a slow progress due to a high teaching load and insufficient support by the supervisors. There seems to be a discrepancy between disciplines, departments or faculties. The Rectorate is well aware of these deficits in certain research groups and undertakes measures for improvement. This however takes a lot of time since there are not enough funds for a generous financial support of PhD students: ~60 PhD study grants of approx. € 400 per month are provided by the Estonian Ministry of Education and Research, making it necessary for many PhD students to take over additional (paid) obligations (e.g. in teaching) to cover their living costs. As a consequence of the relatively small number of PhD study grants, the larger group of the 782 doctoral students presently active at TUT are involved in contract-based projects with “open-end duration” of their theses. The number of PhD defences has varied between 43 and 67 per year in the past 5 years which certainly does not meet international standards: A research university may have a share of 20% of its students at the PhD level of whom a quarter should</p>								

pass their PhD defence per year. For TUT this would mean a long-term goal of 2500 PhD students and 500 defences per year. Considerable funds would be necessary to reach this goal, which, however, are not available in the immediate future. Another aspect to increase the quality of supervision is to form doctoral committees right at the beginning of a PhD thesis, possibly with international participation in the committee (e.g. one member from abroad). This would be for the benefit of the individual PhD students as well as for the project he is involved in.

The assessment committee is well aware of the fact that TUT has a relatively young history as a research institution and hence needs more time to complete the transformation process and to attain European average at the level of doctoral studies. The committee also noted considerable efforts of TUT by (1) forming doctoral schools together with Tallinn University and the University of Tartu, (2) fostering entrepreneurship of students at all levels by offering opportunities in the Mektory or collaborations with industrial partners, (3) sponsoring exchange programs or short study periods abroad, (4) attracting students and PhD students from abroad and thus increasing internationalisation of TUT. Taken together, although several deficits will have to be eliminated at the level of doctoral studies, the assessment committee nevertheless regards student research supervision conforming to the requirements, in particular considering the efforts of TUT undertakes to improve the situation. If in addition TUT decided to introduce the category of assistant professor (see # 3.1), the performance of the average PhD student may be further enhanced.

Commendations:

- Bachelor, master and PhD students interested in translational research and entrepreneurship have access to an excellent platform, the Mektory, to pursue R&D projects.

Recommendations:

- Increase the success rate of doctoral students through providing continued support for the Rectorate's efforts to improve the quality of doctoral studies by strengthening teaching and research project supervision in the different research areas or in those research groups where this is not yet up to standard.
- Redesign the doctoral tract: revitalise the requirements (e.g 2-3 papers in good journals) organize real graduate schools in all faculties, make time-schemes and monitor them, reorganize the supervision (take the doctoral student by the hand), get doctoral students together to support each other, skip supervisors that are not successful.

<p>Areas of Concern:</p> <ul style="list-style-type: none"> TUT should find ways to considerably increase the total number of doctoral students and the annual defences in order to attain European average over the next ten years. Success-rate of doctoral students is too low, in state positions as well as well as in programs for industrial doctorates.
--

4 SERVICE TO SOCIETY

4.1 Popularization of its activities and involvement in social development	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
---	---------------------------------	---	---	--	---	--	------------------------------	--

Requirements:

A higher education institution has a system for popularising its core activities.

Employees of an institution of higher education participate in the activities of professional associations, and as experts, in other social supervisory boards and decision-making bodies.

Comments:

According to the TUT Management System Manual (2014), the objectives of TUT are to foster academic, research and development activities and to provide integrated study and research-based education, offer continuing education, promote academic practices and monitor the needs of society for knowledge-intensive services. The TUT Self-Assessment Report (2014) states that more than 20,000 young people are annually attending different events to learn about academic possibilities. Activities are targeted to school students (courses, workshops, fairs, visits to TUT and enterprises; cooperation is operating with more than 100 general education schools), to parents and alumni and teachers, and to enterprises and investors. Additionally, regular teaching (practice, lab work) is provided in 15 schools where students aspire through daily study is to acquire top knowledge and to prepare for the mathematics Olympiads.

From the media perspective, 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 programs etc. TUT has strategic agreements with national broadcasting and major media editorial staff, and with accredited foreign journalists. Proactive approaches are implemented to build contacts with journalists, including science journalists (encounters-meetings, training, offering news stories etc.). Focus in communication is primarily on provision of expert evaluations and involvement in entrepreneurship issues.

As stated in the Self-Assessment report, TUT staff members are represented practically in all professional associations/societies in TUT's areas of activity, and in some instances hold leading positions. Experts from TUT are engaged in 18 professional boards. 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 Estonian Academy of Sciences, Estonian Higher Education Quality Agency Quality Assessment Council.

Commendations:

- Overall, TUT has increased visibility in recent years. This is due in part to different initiatives including launching the European Innovation Academy (<http://www.inacademy.eu/>), an international technology & start-up conference Latitude 59 (<http://latitude59.ee/>), activation of Tallinn Science Park TEHNOPOL activities (<http://tehnopol.ee/>), and Robotex (<http://www.robotex.ee/eng>).
- The Innovation and Business Centre Mektory (<http://www.ttu.ee/mektory-eng>) is an inviting campus innovation center. It is open to everyone, and is largely visited by local and international guests. The center attracts established companies, partners, and with internationally successful start-up companies. Mektory is also good in international benchmarking – Director of the Centre has been in about 30 Innovation Centres around the world (e.g. Aalto Design Factory).
- The fact that Skype has its original R&D center in the campus area has promoted the University as its home base internationally.
- The development of Estonian start-up community over the recent 5-7 years (sometimes called also *Estonian Start-up Mafia*) together with its successes has also affected positively life in the campus area as well as promoted technology education and business more widely.
- University staff stresses that the reputation of the University is much higher than 3-4 years back – there are many more external cooperation proposals.
- TUT supports spin-off companies such as Cristalsol with 30+ engineers.

- The university has ambitious plans for the Open University including online education through international platforms.

Recommendations:

- Apply expertise and knowledge of distance education and online activities to collaborate between OU and the Education Technology Centre.

Areas of concern:

- TUT will need to address the balance between focusing on what society and the business sector need, and on what is necessary to maintain and extend their future competitiveness. The Estonian economy desperately needs economic restructuring and TUT should perhaps take a more serious leadership role in this.

4.2 In-service training and other educational activities for the general public	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
--	---------------------------------	---	---	--	---	--	------------------------------	--

Requirements:

A higher education institution has defined the objectives regarding in-service training and measures their implementation. In-service training is planned in accordance with the needs of target groups as well as with the potentials and purposes of an institution of higher education.

Participant satisfaction with the quality of in-service training is regularly surveyed and the results are used in planning improvement activities.

Comments:

According to the Self Assessment Report, organization of lifelong learning at TUT arises from the Estonian Lifelong Learning Strategy 2020 that regards everyone as a learner – children, young people, adults, and seniors. TUT Academic Policies specify directions and expected results for continuing education. Coordinated by Open University (OU), a two-year consolidated activity plan is prepared to realize the objectives set forth (the plan is considered at Open University Council and approved by the Vice-Rector for Academic Affairs). Stakeholder feedback is considered when preparing continuing education curricula. Additionally, training programs and courses are tailored according to this feedback. Appropriateness of the curricula and sales potentials of course programs are subject to periodical evaluation and reviewed when the Yearly Report of Continuing Education Activities is prepared. Effectiveness of continuing education activities is monitored by the Open University Council whose function is to present proposals concerning

strategic decision-making in the area to the management. By the end of 2013, the number of continuing education curricula grew from 289 in 2009 to 476 and the number of courses from 440 to 748. The number of learners doubled in the same time period. Beginning in 2012, each faculty and college at TUT designed at least one continuing education course based on the continuing education curriculum. In 2013, 4046 TUT certificates were issued to graduates.

Commendations:

- The entrepreneurial mind-set and the expectation to study entrepreneurship at the University is a very valuable asset.
- The University has ambitious plans with the Open University – its future and lifelong learning more generally is currently high on the agenda.
- Open University has a new management structure and it cooperates effectively with the Innovation and Business Centre Mektory.
- Open University has a new summer school in e-governance, cyber security etc.
- Internationalization of the University is improving (across Estonia it is quite low; about 2,5% of students are international). According to some interviewees, 36% of all foreign students in Estonia studied at TUT in the academic year 2013/2014. The University has study feedback forms in three languages.
- Alumni are giving voluntary courses (especially in business economics, IT etc.) – “We have studied here and will now give back,” has been said by some Alumni. This is partly because it is hard to hire people in these fields like ICT (salaries not competitive with the industry).
- According to employers, since 2004 the University has clearly advanced with its relationships to businesses.
- In-company training and open learning are gradually becoming more successful parts of the University; they fit in the vision that TUT has to play a role in society and has to have close connections with companies.

Recommendations:

- Increase the use of OU-activities (online modules/MOOCs' etc.):
 - Create online education for international platforms.

- Connect the OU with the Education Technology Centre .
- Apply Open University activities (online modules/MOOCs' etc.) in the university programs.
- Increase the speed of benchmark curricula and courses with other successful international universities.
- Balance the learning programs between purely academic single courses and more practical, problem-solving courses.
- Develop and provide the Open University courses jointly with other universities in the region and perhaps also more widely.
- Detail and analyse the lifelong learning costs, compare them internationally
- Measure satisfaction of the wider society to understand the impact of the courses and programs provided.
- Further ICT education across Estonia.
- TUT understands that industrial partnerships are important in lifelong learning planning. However, some big companies may not be aware of these opportunities, and the University may not be aware of some Estonian companies planning for retraining exercises. Therefore, we suggest having more permanent discussions with companies in Estonia.

Areas of concern:

- The primary challenge for TUT lies in planning for continuing education. On one hand, the university has plans to increase the number of participants in lifelong learning programs to 13 000. To do so, the University will need to anticipate opportunities to determine the needs of the future and, not react only to current needs of the current employers. This is especially important if Estonia really wants to achieve structural shifts in its economy (to move towards high value added jobs, activities, business functions and sectors).
- Across the university, there is a need for fewer curriculums, which would lead to better focusing and more multidisciplinary approaches in everything that the University does.

4.3 Other public-oriented activities	conforms to requirements	x	partially conforms to requirements		does not conform to requirements		worthy of recognition	
<p>Requirements:</p> <p><i>Public-oriented activities are purposeful, the results of the activities are periodically evaluated, and improvements are introduced based on those evaluations.</i></p> <p><i>A higher education institution contributes to the enhancement of community welfare by sharing its resources (library, museums, sports facilities, etc.) and/or by organising concerts, exhibitions, performances, conferences, fairs and other events.</i></p>								
<p>Comments:</p> <p>The Self Assessment report notes that 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.), programs targeted to seniors (3rd Youth People’s University), accommodation, rent of rooms for conferences and seminars. Rooms are provided to over 40 amateur art organizations that 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 medallists. Also TUT established the Board of Governors (Kuratuurium) of the University to further align its activities with the needs of the society.</p> <p>Commendations:</p> <ul style="list-style-type: none"> • According to University staff, campus recognition is increasing, there is a good team spirit, and staff is motivated. • Great effort is put into connecting with primary and secondary education (from out of the regional colleges, the Open University as well as from the Mektory) to make exact studies known and attractive. • Alumni are satisfied with the education – “TUT produces the best engineers to be found in Estonia,” said industry interviewees. 								