EKKA

ESTONIAN QUALITY AGENCY
FOR HIGHER AND VOCATIONAL EDUCATION

Report for Institutional Accreditation

TTK University of Applied Sciences

2021

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Introduction

Institutional accreditation

'Institutional accreditation' is the process of external evaluation which assesses the conformity of a University or higher education institution`s management, work procedures, study and research activities and environment to both legislation and the goals and development plan of the higher education institution itself. This is feedback-based evaluation in which an international assessment Panel analyses the strengths and weaknesses of the institution of higher education based on the self-assessment report of the institution and on information obtained during the assessment visit, providing recommendations for improvement and ways of implementing them.

The goal of institutional accreditation is to support the development of strategic management and quality culture that values learning-centeredness, creativity, and innovation in the higher education institutions (**HEIs**), as well as to increase the societal impact of education, research and development delivered by the HEIs.

HEIs are assessed according to twelve standards of institutional accreditation. Assessment focuses on the core processes of the HEI – learning and teaching, research, development and creative activities, and service to society – as well as on strategic management of the organisation and resource management. The learning and teaching process is examined in more detail under five standards (study programme, teaching staff, learning, and teaching, student assessment, and learning support processes). Throughout the assessment process, there is a focus on academic ethics, quality culture and internationalisation.

The Institutional Accreditation Report consists of two parts: (1) evaluation of twelve institutional accreditation standards, and (2) a report on quality assessment of a sample of study programmes.

Educational institution must undergo institutional accreditation at least once every seven years based on the regulation approved by EKKA Quality Assessment Council for Higher Education Guide to Institutional Accreditation.

The institutional accreditation of TTK University of Applied Sciences (hereafter abbreviated TTK) took place in October 2021. The Estonian Quality Agency for Higher and Vocational Education (**EKKA**) composed an international assessment Panel, which was approved by the higher education institution. The composition of the Panel was thereafter approved by the order of EKKA director.

The following persons formed the assessment committee:

Eva Werner (chair)	Rector emer. of the IMC University of Applied Sciences, Krems; Austria
Philippe Bouillard (secretary)	Professor at the Université Libre de Bruxelles; Ecole Polytechnique de Bruxelles; Belgium
Gete Suurraid	Student, Estonian Aviation Academy; Estonia

Klaus Peter Kratzer	Professor, Ulm University of Applied Sciences; Germany
Sebastiaan Meijer	Professor and vice-dean for the School of Engineering Sciences in Chemistry, Biotechnology and Health, KTH; Sweden
Illimar Paul	SENSEI OÜ company owner; Development Manager, Estonian Logistics Cluster; Estonia
Jan-Eric Ståhl	Professor, Lund University; Sweden
Tatjana Volkova	Professor (former Rector), BA School of Business and Finance, Riga; Latvia

Assessment process

The assessment process was coordinated by EKKA staff – Mr. Hillar Bauman and Ms. Marit Sukk.

The Panel held two preparatory meetings, the first on 23.08.2021 when the schedule, background and approach to the visit were discussed and agreed, and the second on 28.09.2021, when the Panel agreed the questions and the handling of the meetings.

During four days, from Monday 11th to Thursday 14th of October 2021, meetings were held with representatives of TTK University of Applied Sciences as well as external stakeholders.

On Friday, 15 October 2021, the Panel held an all-day meeting, during which the findings of the Panel were discussed in detail and the structure of the final report was agreed. Findings of the team were compiled in a first draft of the assessment report and evaluation of the 12 accreditation standards.

The institution did not have any clarifications or comments on the report. The committee submitted the final report to EKKA on November 22, 2021.

Information about TTK University of Applied Sciences

TTK University of Applied Sciences (hereinafter TTK) is a state institution governed by the Ministry of Education and Research, which began operating as an institution of professional higher education in 1992 after the restructuring of TTK predecessor, Tallinn Technical School of Building and Mechanics, which operated from 1961 to 1992. The Garment and Textile Faculty was opened at TTK in 2006 based on the specialities taught at the Tallinn Technical School of Light Industry. TTK and Lääne-Viru College (hereinafter LVRKK) merged on 01.09.2019 as a result of restructuring and the Institute of Service Economy was established based on the former LVRKK.

TTK main building and laboratories of the Institute of Technology, the Institute of Civil Engineering and the Institute of Engineering and Circular Economy are located in Tallinn. The study buildings of the Institute of Service Economy are located 110 kms from Tallinn in Mõdriku. TTK Study and Sports Centre is located in Topu.

According to the Statutes of TTK, the purpose of the university is to offer internationally recognised and competitive professional higher education based on science and technology in the area of engineering, manufacturing and construction; in the field of transport services in the area of services; in the field of business and administration in the area of business, administration and law; in the field

of welfare in the area of health and welfare, and to provide public services based on instruction, applied research and creative activity areas.

The mission of TTK, as a leader in professional higher education, is to help design a learning path suitable for learners and their specific personal needs and to be a reliable partner for the private and public sectors. TTK vision is to be an internationally renowned professional higher education institution committed to top-level learning and applied research. TTK students and staff follow the university's core values in daily operations: a people-focused approach, responsibility and entrepreneurship.

The academic structure consists of six institutes, the Centre for Humanities and Economics and the Centre for Sciences. The management bodies are the TTK Council (higher collegial decision-making body), the Advisory Board, the Board of Professors, the Rector and two Vice-Rectors, the Rectorate, the Management Board, the Heads of Structural units, the Curriculum Council, the Student Council.

Regarding the number of students, during the period under observation, academic years 2016/17 to 2020/21, the share of Estonian students has decreased by 5.3% (47.793 in 2016 and 45.259 in 2020), the student body of TTK has increased by 34.3%, which is related to the merger with LVRKK. If the merger is left aside, then the student basic indicators have remained rather stable. In 2020/21, 4.120 admission applications were submitted for the planned 778 student seats across the 19 curricula.

There are 226 employees at the university in 2020. In addition, 93 visiting lecturers have been involved. Larger changes to the composition of employees took place on 01.09.2019 when TTK merged with LVRKK. In the period 2016-2020, the average age of employees has remained between 47.5 to 50.3 years and the general staff turnover has been between 7.1-10.2%.

Main impressions of the self-evaluation report and the visit

The self-evaluation report (SER) is divided into two parts: the first part is dedicated to general standards (60 pages) and the second part is dedicated to the chosen curricula (117 pages). Both reports were very clear and well-written.

The Panel met with a wide range of students, staff, and other stakeholders throughout the assessment. The Panel found enthusiastic students and dedicated and enthusiastic staff who engaged openly and constructively enabling the Panel to address the diversity of questions it wished to explore.

The professional way in which TTK approached the assessment ensured that the Panel was able to work effectively.

Main changes on the basis of recommendations of the previous institutional accreditation

The previous institutional accreditation took place in 2014. There were 8 main recommendations which the second section of the SER addresses. It is clear from this that TTK has taken positive steps to better highlight the connections between planning documents (although some efforts are still to be made, see hereafter), TTK is aware of the obstacles for sabbatical periods and has developed alternatives to be further incentivised (see hereafter), TTK had developed and implemented staff development measures, TTK is monitoring the drop-out rate and improvements have been observed

(although the efforts are still to be amplified, see hereafter), TTK has significantly improved their internationalisation outlook (although some obstacles to mobility remain, see hereafter), TTK has fostered and increased activities in RDC and spin-off developments (but a related strategy is still to be developed, see hereafter). Finally, TTK has taken strong actions to improve its facilities and improve access to study buildings for people with reduced mobility.

Summary of the institutional accreditation findings

General Findings:

The development planning at TTK is purposeful and systematically involves various stakeholders based on PDCA cycles. TTK has adequately formulated objectives and key results in its Strategic Plan 2021–2025. Information and updates on institutional developments and plans are shared regularly with relevant stakeholders. Various sets of quantitative indicators referring to different institutional levels help monitor the achievement of the objectives.

Resource management includes an HR systemic approach and goal-oriented management of finances and resources. The communication, both internally and externally, is well-targeted and managed.

Quality tools and processes form well designed and closed quality-cycles at institutional as well as unit-level involving internal as well as external stakeholders. Both Quality Management and Quality Assurance are suitable and well established, and the institutional quality culture is based on a common understanding of quality and firmly rooted in the institution.

All necessary documents and procedures regarding Academic Ethics are in place and operational.

A tangibly positive atmosphere encourages international mobility of students and teaching staff and TTK is reasonably well-established in international networks.

TTK has a comprehensive career management system particularly effective to evaluate and supporting staff performance and professional development. The academic staff is qualified for the respective level of education and the students' satisfaction is very high.

The study programmes are designed and developed with the cooperation of various stakeholders and adequately consider the professional standards.

Admission to TTK programmes is clearly regulated and documented, admission processes are continuously improved based on feedback surveys and analysis of features linked to the admission, such as drop-out rates and study motivation. The teaching staff is highly committed to the further development of teaching methods and personal teaching competencies. Student feedback is taken into consideration when it comes to defining improvement measures. Continuous and diligent monitoring of teaching through the Director of an Institute ensures equal learning opportunities for students and compliance with TTK's quality principles on the unit level.

TTK developed an adequate 'Student assessment' document based on national regulations. Feedback to students, support to staff assessment competencies or RPL are well in place and operational.

TTK offers support to students in many different forms: psychological counselling, counselling from the institution's lawyer, scholarships, admission's advice, career counselling and ERASMUS advice. TTK programmes have a wide range of electives for students to choose from. The institution offers its programmes in three study forms – full-time, part-time and distance learning.

TTK has a well-developed RDC infrastructure and interdisciplinary research groups. The extent of RDC is relatively low and varies greatly between teachers. An increase in volume in this area is essential to ensure long-term sustainability. A key issue is also to secure core funding for RDC.

Although TTK complies with the requirements of 'Service to society', the Panel encourages to develop a Service to Society Strategy together with the RDC Strategy.

Strengths

- Strategic planning is systemic and different bodies are involved in the process, responsibilities are clearly allocated, and systematic monitoring of performance is ensured both at central and units' levels.
- TTK has a strong feedback culture taking into consideration feedback from various internal and external stakeholders and diligently using this feedback for continuous improvement.
- Infrastructure is modern and constantly developing; large contributions have been made in recent years to improve the university's work environment.
- The defined understanding of quality is commonly shared by all membership and firmly rooted in the institution.
- The comprehensive career management system is particularly effective to evaluate and support staff performance and professional development.
- There is a strong focus on the employability of the graduates, currently resulting in remarkably high employability.
- Teaching staff is highly committed to student-centredness and further development of teaching competencies.
- The personal and caring atmosphere that TTK provides to its students.

⭐ Worthy of Recognition:

The newly implemented Research Group on Didactics and the Centre for Innovation and Entrepreneurship are valuable initiatives for continuous improvement of teaching, learning, research, and competence enhancement.

Areas of concern and recommendations:

- Although a well-reasoned set of indicators was developed to monitor TTK's development as well as achievement of objectives, the Panel misses an impact-oriented target indicator for Research, Development and/or other Creative activities (RDC), Service to society and Internationalisation. TTK is recommended to ensure that the target indicators in the Strategic Plan address all crucial areas mentioned as trends/objectives.
- For the same reason, TTK is recommended to assign intended value or quantities to the performance and key indicators to enable measurement of the progress and impact.
- TTK is recommended paying attention to the revision of documents and alignment of terminology, terms and definitions as the Panel found some inconsistencies in the relevant documents such as Quality Management Handbook and Strategic Plan.
- In its Strategic Plan, TTK states its intention to further develop its international relationships. To foster this intention, TTK is recommended to provide information on specific measures and activities to be taken in this respect.
- The panel recommends to further enhance internationalisation throughout the institution and create a portfolio of internationalisation activities appropriate for the different programmes and ensuring an international outlook in all curricula and development of international competencies for all students.

- When reviewing the detailed information on the sample programmes, the Panel observed different levels of maturity of the programme and module descriptors and thus recommends professionalising and harmonising the description of learning outcomes and their assessment across all programmes.
- Students are informed about assessment methods, criteria and how these are linked to learning outcomes, but not consistently throughout all programmes, as the panel was informed during the interviews. The panel therefore recommends encouraging staff to consistently explain assessment methods and criteria at the beginning of each course as well as the linkage to learning outcomes.
- Overall, the volume of research remains fair and could be increased. A plan needs to be drawn up to strengthen funding for increased research and thus create an increased applied research volume that involves more teachers, and which in the long term also ensures the development of RDC.

	conforms to requirements	partially conforms to requirements	does not conform to requirements	worthy of recognition
Strategic management	☒	☐	☐	☐
Resources	☒	☐	☐	☐
Quality culture	☒	☐	☐	☐
Academic ethics	☒	☐	☐	☐
Internationalisation	☒	☐	☐	☐
Teaching staff	☒	☐	☐	☐
Study programme	☒	☐	☐	☐
Learning and teaching	☒	☐	☐	☐
Student assessment	☒	☐	☐	☐
Learning support systems	☒	☐	☐	☐
Research, development and/or other creative activity	☒	☐	☐	☐
Service to society	☒	☐	☐	☐

Key to evidence

E: interviews with employers and other external stakeholders
M: interviews with management staff
S: interviews with students
A: interviews with alumni
T: interviews with teaching staff
SER: Self-Evaluation Report

1.1.　Strategic management

Standard:
Development planning at the higher education institution is purposeful and systematic, involving various stakeholders. The higher education institution regularly evaluates the achievement of its stated objectives and the impact of its activities.

Guidelines:
The HEI has formulated the objectives and key results for its core activities – learning and teaching; research, development and creative activities, and service to society – considering national priorities and the needs of society, focusing on its strengths, and reducing unnecessary duplication both within the HEI and throughout higher education in Estonia. The HEI is managed in accordance with its mission, vision, and core values, as well as objectives set out based on those principles. Achievement of the objectives and effects of the activities are evaluated regularly. Creativity and innovation are supported and given value in both core and support activities. Membership of the HEI (including students), as well as external stakeholders, is involved in developing and implementing the HEI's development plan and action plans. The HEI members share the core values that serve as a basis for the institution's development plan.

Indicator:
The rate of achieving the objectives set in the development/action plan (key results)

Evidence and analysis

The development directions for TTK's core areas Study, Research, Development and Creative activities as well as Service to Society are set out in the institutional Strategic Plan which constitutes the basis for TTK's strategic management. According to the SER, Strategic Plans are regularly set up for a period of five years, coordinated with the Ministry of Education and Research and approved by the TTK Council, the highest collegial decision-making body. The current Strategic Plan covers the period 2021–2025.

In the interview (M), the Rector of TTK explained that TTK's Strategic Trends as highlighted in the Strategic Plan are to be understood as TTK's response to the general higher education (HE) development trends. These general trends were translated into development directions for TTK, as well as objectives and broad guidelines for specific areas of development and underpinned by concrete courses of action. The trends and courses of action implicitly reflect the institutional vision to be an internationally renowned HEI with top-level teaching (e.g. reflected in aspiration to do

research with foreign institutions, support of mobility, innovative teaching approach, etc.), its mission to design learning paths suitable for their learners (through the promotion of students' success and offering life-long learning opportunities), be a reliable partner (through cooperation, projects, training), and its core-values people centeredness, responsibility and entrepreneurship. TTK's trends range from organisational structures as well as the well-being of TTK's members, to promoting the study and lifelong learning, modern approaches to learning, promoting R&D and innovation and infrastructure as well as community service and communication (Strategic Plan, p. 3

Various internal, as well as external stakeholders, were involved in developing the strategic plan, drafts of which were iteratively revised in interaction with those. In the interviews (M, T, S, E), it was confirmed that these drafts had been shared internally and externally, reviewed and commented up and down and horizontally in the organisation before final approval. The trends and courses of action are linked to national priorities and the needs of society to prepare practitioners in the field of engineering and to develop applied research with others. Furthermore, the requirement of no duplication of HE offers in the respective study fields in Estonia was observed, thus reinforcing TTK's strengths in the engineering field for example.

Management tasks and responsibilities for the implementation, monitoring and evaluation of the strategic goals are defined in documents related to the institutional Strategic management such as TTK's Statutes, and the Quality Management Handbook. The interdependency of actors is well visualised in the SER (Organisational structure, p. 8). The regulations, codes of procedure, etc. are established with a decision by TTK Council. To demonstrate the progress from the previous period, the reflection on how far the targets set for the previous period of development (2016–2020) have been met is provided in the Strategic Plan for 2021–2025, following a SWOT analysis of the previous plan.

To assess the relevance of the trends/objectives and courses of action, and to monitor the results and achievements of the process activities, the institution has agreed on eight target indicators for the period of 2021–2025 which are aligned to the defined areas of development (Strategic Plan, p. 8). These target indicators are complemented by the institution performance indicators, including key indicators (Quality Management Handbook, pp. 14–18). Target indicators, as well as performance and key indicators, are used to evaluate the institutional strategic performance based on the annual action plans. The results are then analysed and used for further developments within the PDCA (Plan-Do-Check-Act) cycle.

Various sets of quantitative indicators referring to different institutional levels help monitor the achievement of the objectives. Although TTK has defined target indicators in the Strategic Plan, these could be more purposefully linked to TTK's vision. TTK has also developed a document on internationalisation directions for 2021–2025, which supports and delineates the objectives referring to internationalisation established in the Strategic Plan. Key indicators regarding mobility (study or internship periods abroad) in terms of outcome-based funding are defined in this document.

Although a well-reasoned set of indicators was developed to monitor TTK's development as well as achievement of objectives, the Panel misses an impact-oriented target indicator for Research, Development and/or other Creative activities (RDC). The Panel also found out that creativity and innovation did not receive much attention in the Strategic Plan and that there are no target indicators linked to these areas. The same refers to the core area of Service to society and community for which

only one revenue-based target indicator is mentioned in a Strategic plan; here again, impact orientation should be taken into consideration.

Some progress could be noted by the Panel towards the recommendation given by the previous accreditation report to 'better highlight the connection between planning documents', although the alignment and connection between the various planning documents, e.g., the Strategic Plan and Quality Management Handbook still require further attention by the management as mentioned above.

According to the SER and the interviews conducted (M, T, E, S) as well as the relevant documents, it becomes evident that members of the HEI (including students), as well as external stakeholders, are systematically involved in developing and implementing the HEI's Strategic Plan and action plans either through representation in Councils and Boards or through meetings and surveys. The Strategic Plan is approved by TTK Council representing the management, the academic staff, and the student body. The analysis of fulfilment of the action plan takes place twice a year. The Annual Report is compiled based on the responsible unit reports and introduced to the Advisory Board which is composed of external members such as representatives of employers' associations, national or municipality agencies, etc. The Board assesses the TTK annual report and can make proposals to the Minister of Education and Research (SER, p. 8) considering regional needs and developments.

Information and updates on institutional developments and plans are shared regularly with the stakeholders, 'relevant activities and results are discussed at the information meeting at the beginning and end of the academic year' as the panel learned in the interview with the Rector. It was confirmed in the interviews (S, T, M) that staff and external stakeholders are involved in these discussions and that all membership is regularly updated on relevant issues, activities and outcomes of analyses. The staff of TKK shares the core values that serve as a basis for institutional development. Evidence was given in the interviews with staff and students (M, T, S) that TTK is committed to and demonstrates student centeredness, with responsibility and entrepreneurship forming a good basis for further development.

Members of the Advisory Board have strategic outlooks and clear mandates/goals for why they are present in the board. They experienced that their voices are heard by TTK management, their input promotes collaboration which leads to value, they gained from institutional activities and particularly from graduates. Advisory Board members also confirmed that TTK lives up to its mission to be a reliable partner and foster the development of Estonian society and national and regional industry. To foster this mission, the Panel found out that TTK would benefit from a longer strategic outlook particularly with regards to its ambition to be the driver of change and pioneer in addressing future challenges and opportunities and making proactive decisions to create a desired future.

Conclusion

TTK complies with the requirements of Standard 1.1 'Strategic management' as the development planning at TTK is purposeful and systematic, involving various stakeholders based on PDCA cycles. TTK has adequately formulated objectives and key results in its Strategic Plan 2021–2025. Information and updates on institutional developments and plans are shared regularly with the stakeholders. Various sets of quantitative indicators referring to different institutional levels help monitor the achievement of the objectives.

Strengths

- Strategic planning is systemic and different bodies are involved in the process, responsibilities are clearly allocated, and systematic monitoring of performance is ensured both at central and units' levels.
- Involvement of different stakeholders both internal, including students, and external, in strategic management planning processes on a regular basis.
- Implementation of the strategic plan is diligently monitored involving different institutional levels.

Areas of concern and recommendations

- Although a well-reasoned set of indicators documented in the QM Handbook as well as in the document Internationalisation directions for 2021 – 2025 was developed to monitor TTK's development as well as achievement of objectives, and the courses of actions elaborated in the Strategic Plan do refer to all trends/objectives, the Panel misses impact-oriented target indicators for Research, Development and/or other Creative activities (RDC), Service to society and Internationalisation in the Strategic Plan. TTK is recommended to ensure that the target indicators in the Strategic Plan address all crucial areas mentioned as trends/objectives.
- For the same reason, TTK is recommended to assign intended value or quantities to the performance and key indicators to enable measurement of the progress and impact.

Opportunities for further improvement

- TTK is encouraged to take a longer strategic outlook to be a pioneer in identifying and addressing future challenges and opportunities, and take proactive decisions based on the broad involvement of stakeholders.

1.2. Resources

Standard:
The higher education institution develops its staff and manages its physical and financial resources in a purposeful, systematic, and sustainable manner. Internal and external communications of the higher education institution (including marketing and image-building) are targeted and managed.

Guidelines:
The HEI has an efficient staff development system. The principles and procedures for employee recruitment and development are based on the objectives of the HEI's development plan and are fair and transparent. The career model of academic staff motivates talented young people to start their academic careers, creates opportunities for progress, and ensures sustainability of the academic staff. The principles for employees' remuneration and motivation are defined, available to all employees, and observed.
Allocation of the HEI's financial resources is based on the objectives of its development plan. The management and development of its infrastructure (buildings, laboratories, classrooms, IT systems, etc.) are economically feasible. Sufficient resources are available for updating the infrastructure for education and research, and/or a strategy exists enabling the HEI to acquire them.
Enough textbooks and other learning aids are available, they are of uniformly high quality and accessible. Publicly offered information about HEI's activities (including study programmes) and the findings of external evaluations is correct, up to date, easily accessible and understandable. The HEI has a system to popularise its core activities and academic career opportunities. The HEI has a functioning system for internal and external communications, relevant to the target audiences. The HEI members are informed of the decisions relevant to them in a timely manner.
Employee satisfaction with management, working conditions, information flow, etc., at the HEI is surveyed regularly and the survey results are used in quality improvement activities.

Indicators:
- *Distribution of revenues and costs (incl. RDC activities)*
- *The results of the staff satisfaction survey*

Evidence and analysis

Resource management which includes all aspects of HR management, a goal-oriented and purposeful management of finances and financial resources as well as infrastructure proceeds from the tasks, obligations and rights provided in the university's and structural units' Statutes and other legal acts. The long-term strategic goals of staff management as well as the aligned courses of actions are described in the institution's Strategic Plan; the actions and measures to achieve the goals are documented in the Annual Action Plans and framed by a set of indicators to help monitoring the achievement of goals.

Staff recruitment and development procedures aim at ensuring that studies offered by TTK are executed by professionally competent people, ready to support students' personal development and value continuous self-development as well. (SER). As TTK seeks to attract professionally well-experienced people, the number of staff members up to the age of 30 has decreased during the past years, whereas for the rest a well-balanced age-distribution prevails (SER). The most valuable characteristics for staff members are motivation, dedication to their tasks, and the willingness to enhance their own competences, as the rector explained in the interview (M). Throughout the

interviews with staff members, the panel could gain evidence that TTK's staff does comply with these features.

Recruitment and selection of academic staff follows the regulations transparently laid down in the document *Conditions and Regulations for Creating and Filling Academic Staff Positions (SER)* and is based on public competition. Qualification requirements are included as numerical indicators in the institutional quality management. Onboarding of new employees is accompanied by a support person to ease the phase-in process.

To develop and enhance employees' genuine and academic knowledge and skills TTK has defined a development and training programme which is based on employees' feedback and requirements for further skills' enhancement. The panel gained evidence in the interviews that TTK's goal TKK diligently monitors staff development not only by the trainings offered but also by supporting staff to participate in national and international conferences and meetings, by peer-learning and fostering exchange of experiences, teamwork and cooperation. The respective satisfaction survey showed that employees' satisfaction with development opportunities was rather high based on the 2020 satisfaction survey, the claim 'Work offers me opportunities for self-development' was given an average rating of 4.3 on a scale of 5. and this was also confirmed in the interviews.

In 2019, TTK established an academic staff career model thus creating a transparent and fair staff development model. This model described and documented in the *Academic Staff Positions, their Qualifications, Requirements and Employment Duties,* comprises a teaching and a research track, both of which can be initiated either by competition or performance evaluation. In the interviews the panel learned that staff members appreciate staff performance evaluation as this is an excellent tool for self-development and reflection. The career model is seen as a well-chosen means to enhance motivation to further develop within the scientific community (S, M). Interviewees also mentioned appreciatively various motivation packages that also contribute to the high job satisfaction demonstrated in the results of the staff satisfaction survey. The panel got convinced that TTK pays high attention to staff development, staff retainment and physical and mental well-being of staff, thus living up to its core value of people-centeredness.

Remuneration principles are provided in the university's Remuneration Procedure. The remuneration is competitive compared to the average in the region and the education sector. Employees' satisfaction with their remuneration is also inquired during the annual satisfaction survey. Based on the results of the 2019 survey, managers and support staff consider their remuneration more in correspondence with their contribution (correspondingly 4.5 and 4.0 on a scale of 5) (SER), whereas the corresponding indicator for academic staff was 3.6. obviously due to intra-institutional differences as the panel was told in programme interviews.

The Panel has learned from the SER and through interviews with the management (M), that the organisation of financial management and record-keeping procedures are within the responsibility of the university. The State Shared Service Centre organises the accounting and is responsible for its correctness. The university's financial management strategic plan is defined as a part of the Strategic Plan, it is supported by an income-expense forecast for four years and the university's legal acts. In recent years, the state and university have contributed to the digitalisation of processes and smart workflow: the financial information system SAP and SAP BO, sales software Erply, Government Employee Self-Service Portal RTIP (business trips, training, asset management, etc.) have been adopted. Due to digital developments, accounting has become faster and less labour-intensive.

The distribution of the university's financial resources proceeds from the objectives set out in the institution's Strategic Plan and the tasks planned in the Action Plan. Budget Planning also involves

members of structural units to ensure sufficient resources for high-quality programme deliver. Directors of the Institutes confirmed that the budgeting of the programmes is diligently done and ensures that programmes have sufficient financial means to cater for necessary learning material etc.

According to the SER, TTK's budget includes state funding (on average, 82% of the total budget), own income (on average, 7%) and project and programme support (on average, 11%). To a small degree, TTK's RDC costs are funded from state funding. The panel was confirmed that the institution's budget has been managed sustainably, the budget outturn has been positive every year and large, investments in infrastructure (learning and work environment and study laboratories) could be made: Thus study laboratories with an emphasis on digital and virtual components were developed, which increase and diversify the university's RDC capacity in the future, e.g. robotics laboratory, electrical technology laboratory, logistics simulation laboratory etc. As the site visit was done as an online visit, University's Communication and Marketing Unit had created a very professional video overview of the Resources, including these new laboratories. In the interviews with the management (M), it was explained that during the period of the Strategic Plan 2016-2020, one of the most important objectives and achievements was raising the university's strategic capacity and efficiency of using resources according to the objectives set in the project 'TTK Lean'.

This project has led to an almost paperless administration and thus more efficiency. Current attention is paid to also lower the costs through the Lean approach, among others through the use of a new software for data management.

Earning own income by providing specific knowledge services is supported by the Centre of Innovation and Entrepreneurship, provision of in-service training courses is coordinated by the Office of Academic Affairs. The main sources of TTK's own income are paid study services, in-service training courses, and applied research projects. As the Panel learned from the interviews (M), a dedicated manager was hired in October 2021 to manage the promotion of TTK's services in particular, applied research as a service to the companies and therefore increasing the share of TTK's own income.

The university's integral work environment is made up of the physical and mental environment. Large contributions have been made in recent years to improve the university's work environment, including creating ergonomic workstations, building the ventilation system, building rooms jointly used by staff and students and establishing an indoor health track. The Panel was provided with a video overview to demonstrate the work environment conditions. Two Panel members from Estonia also visited the University physically, and not only confirmed the work environment related statements in SER, but also highlighted the appealing environment they had seen. Employee satisfaction with the work environment is good as can be seen in the *Annual Survey on working arrangements and working environment,* and was also confirmed in the interviews. The fact that in 2019, TTK was awarded the Family Friendly Employer Silver Label by the Ministry of Social Affairs which focuses on employee welfare, including creating a good work environment, and striking a balance between work and family life, again demonstrates the institution's core value of people-centeredness.

During the reporting period, the university regularly renewed its ICT tools as was mentioned in the SER and confirmed in the interviews. In the scope of modernising ICT, primarily cloud services have been expanded, and speciality software service agreements have been concluded to make sure students can use the software free of charge. As of 2020, providing and supporting flexible and blended learning has become more important, TTK plans to invest 7-12% of the state funding budget each year to ensure sustainable development in this respect. The panel sees this investment also as an investment in staff competence development as well as enhancement of teaching and research quality, as wider access to national and international channels and resources will be created. However, the Panel learned from the interviews (M, S, T), that due to the increased volume of internet traffic by

the wide use of video conferencing and learning tools in distant and hybrid learning, some occasional challenges are faced with the stability of the internet connection in the Tallinn building during some peak times.

In 2020, the university employees' average satisfaction with the university's IT solutions and comprehensibility of information systems was rather high (4.2 out of 5) according to the SER.

According to the SER and interviews, TTK's strategic goals for external communication are marketing of curricula and in-service training, cooperation with companies, promotional activities, information on activities as well as on strategy and quality related issues. Target groups for external communication are future learners, national and international cooperation partners, alumni and the labour market. Communication channels comprise the institution's webpage but also social media. Very important news are published on the institution's webpage also in English to raise international visibility of TTK as the panel learned.

The Panel learned from the interviews with the Management and Communication and Marketing Unit that the internal communication target groups are the university's employees and students. Information to students is shared in the study information system, on the homepage and on social media to make sure information reaches students quickly. The main internal communication channels for employees are the weekly Rectorate meetings, the bi-weekly Management Board meeting, the weekly employees' information letter, the Intranet (GuavaHR), collaboration tools, as well as monthly meetings of institutes and centres, either physical or virtual according to need. In the interviews, staff convincingly stated that the system of internal communication works well and ensures timely information, however, has become a bit blurred due to the merger with LVRKK.

TTK promotes and provides lifelong learning in all of the university's study areas according to the SER. Training activities proceed from the Adult Education Act and Lifelong Learning Strategy, organisation of training is regulated by the document 'Forms of In-service Training, Procedure of Conducting In-service Training and Quality Assurance'. In 2019, TTK joined the pan-institutional platform Juhan created to manage in-service training courses, which has made work more efficient and provides an overview of in-service training within TTK and more broadly, of what other training organisers provide.

Conclusion

TTK complies with the requirements of Standard 1.2 'Resources' as the resource management includes HR management, systemic approach and goal-oriented management of finances and resources. The communication, both internally and externally, is well-targeted and managed, work environment, work organisation and employees' satisfaction are regularly evaluated and reviewed. Staff development, and staff well-being are strategic key factors which TTK diligently attends to.

Strengths

- Well-designed career model and staff development plan that allow personal and professional staff development
- High employee satisfaction with work environment and work organisation
- Diligent financial management which leads to positive budget outturn
- Continued use of the results of the TTK Lean project to further enhance institutional efficiency has led to an almost paperless administration and leaner organisational structure.

- Modern and constantly developing infrastructure to improve the university's work environment.

Opportunities for further improvement

- TTK is encouraged to develop a new internet gateway to cope with the increased volume of internet traffic due to the wide use of video conferencing and learning tools in distant and hybrid learning.
- TTK is also encouraged to review its internal communication channels to assure compatibility with the now enlarged institution.

1.3. Quality Culture

> **Standard:**
> The higher education institution has defined the quality of its core and support processes, and the principles of quality assurance. In the higher education institution, internal evaluation supports strategic management and is conducted regularly at different levels (institution, unit, study programme), the findings of internal and external evaluations are analysed, and quality improvement activities implemented.
>
> *Guidelines:*
> *Members of the HEI have agreed upon definitions for the quality of their core and support processes and are guided by them in their daily work. The HEI develops and publicises its policies and procedures for internal quality assurance (internal evaluation) and conducts regular internal evaluations, which consider, inter alia, the standards set out in this Guide, and incorporates feedback from its members and/or from external experts. During internal evaluations, peer learning, comparisons with other HEIs regarding their results and means for achievement, as well as a sharing of best practices take place, among other things.*
> *Internal evaluation is based on the following key questions in quality management: What do you want to achieve, and why? How do you want to do it? How do you know that the activities are effective and will have the desired impact? How do you manage the quality improvement activities?*
> *Regular reviews and enhancements of study programmes ensure their relevance, including their compliance with international trends.*

Evidence and analysis

According to TTK's SER, the common understanding of quality and the institutional quality management system form the backbone of the institutional quality culture based on shared values, cooperation, and involvement. The underlying guiding principles, fields of activities, (general) responsibilities, QA tools, processes as well as indicators are described and documented in the Quality Management Handbook (QM-Handbook), and the Statutes of TTK, both transparently available for all staff on the university's website. Even though the QM Handbook is quite comprehensive, flow-charts to visualise the interlinkage of processes and interaction of involved stakeholders are not yet provided but planned as the panel learned in the interviews.

TTK's understanding and definition of quality refer to the compliance with the requirements regulating HE, meeting the needs and expectations of its stakeholders and to the satisfaction of its learners with the experienced service. This definition is laid down in the institutional QM-Handbook and forms the basis for the institutional quality policy and quality work. The policy builds on five quality principles which refer to stakeholders, coherence of objectives, process-oriented management, continuous improvement, and analysis-based decision making. The interviews revealed that the commonly elaborated definition of quality as well as a common understanding of this definition's implication on daily work is shared and firmly rooted at all levels of the institution. Convincing examples of how this definition of quality is translated into operations were provided in all staff interviews (M, T).

The Panel found out that there was some inconsistency in the terminology used in the SER, the Strategic Plan and the QM-Handbook which, according to information provided in the interviews (M) is due to different document revision cycles. The Panel recommends TTK sort out this issue to avoid misunderstandings or misinterpretations among its members.

The institutional quality management system (QMS) incorporates both national legal requirements and the institutional process-oriented approach reflected in the PDCA cycle which TTK translates as planning – implementation – control – improvement (SER and QM-Handbook). These four core activities englobe the core processes Study activities (teaching and learning), Research, Development and Creative activities (RDC) and Services to Society as well as Support processes. According to the institutional process map (Appendix 3 of QM-Handbook), Study activities comprise curriculum development, the admission process for students as well as the monitoring of the Academic progress of students. The core process of RDC comprises Conduction of research, Cooperation with companies and Publications. The Services to Society include Lifelong learning, the organisation of services and events for the public, participation in the work of associations and networks and offering library services and recreational activities to the public. All core processes are interlinked to the support processes, explanations of how this interlinkage functions in daily operations were given in the interviews (M, T). Procedures for processes are laid down in specific documents and regulations such as Admission regulations, Guidelines for recognition of prior learning and work experience (RPL), etc. and transparently displayed either on the webpage or on the internal web. Furthermore, TTK interpretations of quality-related terms are included as an appendix in the QM-Handbook. According to the process map (SER), the responsibility for the core processes is assigned to process managers and the two Vice-rectors, implementation and execution responsibilities are attributed to unit heads who are well aware of these as was confirmed in the interviews (M).

For each core and support process, the institution has defined a set of indicators that comprise those given by Estonian legislation and EKKA Guidelines, as well as institutional ones. Core processes are attributed performance indicators and key performance indicators, the distinction of which is described in the QM-Handbook: key performance indicators are critical quantitative performance indicators of the organisation's performance according to which action plan goals are set (sic QM-Handbook), and are key for monitoring the development of the institution; performance indicators are defined as quantitative indicators to assess the efficiency and effectiveness of processes and relate to both core and support processes. Defined indicators are regularly used to assess processes and programmes, nevertheless, the Panel found that some (core) processes (e.g. Internationalisation, Service to Society) need more precisely defined indicators as to quantity and timeline to also assess the process of improvement and percentage of achievement of targets.

The first step in the quality cycle – planning – demonstrates the implementation of Quality assurance at the institutional level; it mirrors the strategic goals set out in the five-year Strategic Plan under 'Trends'; planning is based on the SWOT analysis of the previous period and the results and analyses of various surveys (students, staff, alumni, employers) as well as on input from external stakeholders (advisory Board, thesis supervisors, internship supervisors, companies and professional bodies) all comprehensively compiled and documented in the respective Annual Report.

The Annual Action Plan which is discussed at the meetings between Rectorate and Management Board defines the objectives and activities of an upcoming year derived from the Strategic Plan and considers the results of the previous year analyses, financial and human resource aspects, infrastructure as well as Risk management issues (SER). The planning process involves the Rector, Vice-rectors, heads of structural units and student representatives as well as the Advisory Board members who bring in the needs of the labour market. The broad participation of internal and external stakeholders in this process was appreciatively mentioned in the respective interviews (M, E, A, S, T). The Panel finds that

this process reflects a comprehensive and participatory approach as well as the guiding quality principles of the institution and constitutes a particular strength of the TTK.

Implementation – the second step – refers to the execution of processes and process performance at the institutional and unit level, which is done in close cooperation of the academic units and the support units that are responsible for data collection and data analyses. This was confirmed in the interviews and underpinned by examples.

For the institutional monitoring - step three control - a set of indicators (Appendix 2 of QM-Handbook) is used through which the achievement of set objectives (mentioned under the course of actions in the Strategic Plan) is measured and analysed (mid-year and end of the year. Achievement results and analysis of results form the basis for step 4 – Improvement – which also considers the feedback and expectations stemming from various stakeholders gathered either through direct communication (e.g., Advisory Board), focus group interviews, surveys, as well as feedback from students, internship companies and thesis supervisors.

To foster the implementation of the institutional Quality culture and shape TTK as a learning organisation (SER) TTK uses regular internal evaluations and surveys targeted to different internal and external stakeholders. Thus, internal quality assurance builds on four main pillars: 1. Various stakeholder feedback surveys (students, staff, in-training participants, alumni) – done regularly; 2. Internal assessment of curricula – not yet regularly done according to SER but planned to be as the Panel learned in the interviews (M); 3. Thematic internal assessments – not regular but based on need; and 4. The compilation of annual reports – regularly done.

The QM-Handbook provides an overview on these feedback surveys all of which follow a clear objective (what to achieve?), have a defined timeline and definition of survey type (how to know?) as well as an indication of rationale (why to achieve?) and persons/groups responsible for the implementation of outcomes. All results are analysed, feedback coming from the various stakeholders as well as compliance to EKKA standards are also considered. Consequently, measures for improvement are derived from these analyses and suggested to the respective body.

Internal assessment of curricula, the second pillar of TTK's internal quality assurance, is done based on the respective performance indicators (Appendix 2 QM-Handbook), outcomes of stakeholder surveys (Table 14 SER), feedback from the labour market received through TTK's Advisory Board, curriculum councils (with student representation), thesis defence committees, professional organisations, and alumni feedback. These assessments target the relevance of the curricula for the needs of the labour market, study programmes' compliance with international trends, check if the content is still up-to-date and competence development aligned to demands from a dynamically developing professional field. Inter alia, evidence for this was given by the example of the development of the study programme 'Robotics' where labour market needs, comparisons' with programmes of other HEI (including international ones), national trends and international trends as well as compliance with qualifications and quality standards were thoroughly analysed and taken into account.

Thematic internal assessments, the third pillar of academic Quality assurance, stem from needs derived from compliance with indicator targets and survey analysis and focus specific issues such as e.g., assessment of drop-out rates, switching to remote learning during the COVID crisis, etc. Thematic internal assessments are designed to find appropriate solutions to issues of concern and complement

the results of feedback surveys. They are good practice as actions for improvement and should be done regularly. As an example for evidence, the assessment of drop-out rates can be mentioned which resulted in changing the admission criteria as well the implementation of additional support to first-year students.

Compiling the annual reports (4th QA pillar) means analysing all results gained and planning activities of improvement for the following year with a focus on the key performance indicators of the core processes Study activities, RDC and Service to society. Data are provided by support units, the analyses are done in working groups, meetings of the Rectorate and in management seminars which take place twice a year. As surveys and data provision are within the responsibility of different support units depending on the target group of a survey, the panel spotted a risk of creating an overlapping of activities and confusion on the side of those involved. Task distribution should be streamlined and thus made more efficient.

All results as well as input from working groups and curriculum councils feed back into the PDCA cycle and foster continuous improvement. The Panel found that the defined quality tools and processes form well-designed and closed quality cycles; the PDCA cycle functions well and provides a robust framework for TTK quality culture.

Peer learning is well-rooted in the institution and thus also fosters the institutional quality culture: it happens both inside a unit and across units and institutes. Examples were brought forward in the interviews (M, T) and range from team teaching, sharing of experiences and good practices in workshops or on platforms, to commonly executed projects as well as learning from colleagues from other national and international institutions. (e.g., during staff mobility).

The internal alignment of the quality culture is managed through the management meetings, which are regular and frequent, particularly given the size of the institution. Furthermore, there is an anonymous survey mechanism for continuous feedback in place.

Conclusion

TTK complies with the requirements of Standard 1.3 'Quality culture' since the defined quality tools and processes form well designed and closed quality cycles at institutional as well as unit-level, involving internal as well as external stakeholders. Both Quality Management and Quality Assurance are subtle and well established, the institutional quality culture is based on a common understanding of quality and firmly rooted in the institution.

Strengths

- The annual planning process is comprehensive with a strongly participatory approach involving internal stakeholders (including students) as well as external stakeholders.
- The PDCA cycle is well implemented throughout the institution and supports institutional development planning.
- The defined understanding of quality is commonly shared by all membership and firmly rooted in the institution.
- TTK has a strong feedback culture taking into consideration feedback from various internal and external stakeholders and diligently using this feedback for continuous improvement.

- The cooperation with working life and the labour market with regards to enhancing the quality and relevance of curricula is ensured by a highly committed Advisory Board assembling representatives from professional bodies and companies.

Areas of concern and recommendations

- TTK is recommended paying attention to the revision of documents and alignment of terminology, terms and definitions as the Panel found some inconsistencies in the relevant documents such as Quality Management Handbook and Strategic Plan.

Opportunities for further improvement

- To make processes and the interaction of the various actors involved more explicit, TTK is encouraged to follow the plans of visualising QA processes as mentioned in the interviews.
- On the operational side, TTK is encouraged to critically reflect and streamline the distribution of tasks and duties as to surveys and data collection to avoid duplication and interference of tasks and responsibilities.

1.4 Academic ethics

Standard:
The higher education institution has defined its principles for academic ethics, has a system for disseminating them among its members, and has a code of conduct including guidelines for any cases of non-compliance with these principles. The higher education institution has a functioning system for handling complaints.

Guidelines:
The HEI values its members and ensures that all its employees and students are treated according to the principle of equal treatment.
Employees and students of the HEI are guided by the agreed principles of academic ethics in all their activities. The HEI respects fundamental values and policies of research set out in the document, 'Research Integrity', issued jointly by Estonian research institutions, the Estonian Academy of Sciences, the Estonian Research Council and the Estonian Ministry of Education and Research.
The HEI supports its students and teaching staff in their understanding and responding to ethical issues. Teaching staff and students do not tolerate academic fraud, including cheating and plagiarism, and they will act immediately upon any such occurrence.
Management of complaints from HEI members (including discrimination cases) is transparent and objective, ensuring fair treatment of all parties.

Indicator:
Number of academic fraud cases

Evidence and analysis

TTK names a series of principles on which their implementation of the standard is based; all of these are laid down in the document 'Ethical Principles for TTK UAS' Employees and Students' (SER) – the underlying values are well defined under the headings of Dignity, Integrity, Justice, Loyalty, and Independence. The general understanding and adoption of such values have been extensively explored in the on-site meetings (M, T, S). It was somehow surprising, that responsibility (versus individuals and society) has not shown up in this context, but this, of course, does not affect the establishment of the standard.

The aforementioned document also addresses in a satisfactory manner the ethical aspects of research which, in general terms, are in line with the principles brought forth in the 'Estonian Code of Conduct for Research Integrity'

TTK has satisfactory mechanisms to propagate documents and guidelines among its staff and students. All necessary documents are available to all members of TTK (SER). Enquiries with students (S) showed that the familiarity with the rules against plagiarism is satisfactory but the familiarity with other important principles such as academic values and rules of conduct could be improved, although interviews with teaching staff showed that such an effort is at least attempted (T). Students are already instructed in the values in the first year, but according to what the panel learned in the interviews repetition in the following years happens rather sporadically.

No reference is made, however, to the processes ensuring necessary revisions or extensions of such guidelines, and how to spark debates of the underlying academic values among the members of the university.

There is a well-defined and well-established set of procedures handling breaches of academic ethics within the university (most important: 'Procedure for Processing Students' Academic Practice Violations and Indecent Behaviour'). There is a strict policy of no-tolerance for breaches of ethics by students; likewise, there can be formal complaints and also evaluations to uncover such breaches committed by staff (SER).

Special consideration is directed at the detection and sanctioning of plagiarism in academic work (SER). Students are instructed in the values and techniques of good-faith academic work (S, T), primarily in the first year of studies while in the subsequent years reinforcements seem to occur rather sporadically.

In its policy, TTK relies heavily on the plagiarism software *Urkund* and encourages all parties involved (teaching staff and students) to use it in a pre-emptive manner, but also to document the validity of academic work, namely in papers and final theses (SER). Since the down points of such software are well known, there is an arbitration process defined to avoid potential misunderstandings in general, but specifically, such which might be induced by *Urkund*.

Conclusion

TTK complies with the requirements of Standard 1.4 'Academic Ethics' since all necessary documents and procedures as defined in the standards and guidelines are in place and operational.

Opportunities for further improvement

- TTK is encouraged to propagate the contents of the document 'Ethical Principles for TTK UAS' Employees and Students' among students, not only in the first year of studies but also in subsequent years, e.g., as case studies.

1.5 Internationalisation

Standard:
The higher education institution has set objectives for internationalisation and assesses the attainment of these objectives regularly. The higher education institution has created an environment that encourages international mobility of students and teaching staff, supporting the development of learning, teaching and RDC activities, as well as the cultural openness of its members and Estonian society in general.

Guidelines:
The HEI creates opportunities for international student exchanges by offering study programmes and/or modules taught in English. The learning environment at the HEI supports internationalisation and cultural openness.
Recognition of qualifications and recognition of prior learning and work experiences for student admission and programme completion are in accordance with the quality requirements set by the HEI, are systemic and consistent with the expected learning outcomes and support international student mobility. The organisation of studies at the HEI facilitates student participation in international mobility. The HEI has agreements with foreign higher education institutions and, through international exchange, sends its students abroad to study and undertake practical trainings, providing comprehensive support for this. Members of the teaching staff encourage students to participate in international mobility. International lecturers participate in the process of teaching, including supervision of doctoral theses. The HEI supports and recognises the participation of its teaching staff in international teaching, research or creative projects, as well as their teaching, research or creative work and personal development which are performed at HEIs abroad.

Indicators:
- *Teaching staff mobility (in-out)*
- *Student mobility (in-out)*
- *Number of English-taught study programmes by main units and levels of study*

Evidence and analysis

The principles and objectives of TTK's internationalisation strategy are not part of the Strategic Plan of the university. Instead, they are laid down, in laudable details, in the document 'Internationalisation directions for 2021–2025'. This document describes the quality and rationale but not the intended quantity of such measures in the future, nor the distribution of planned internationalisation activities across the different curricula.

All relevant data drilled down to the study field level is available in the annual report of the university (M). Adequate performance indicators for internationalisation activities are defined in the quality processes (SER, Quality Management Handbook), such as number of foreign visiting students, students' outgoing mobility, number of curricula containing courses in English, volume of studies in a foreign language, total number of outgoing staff in mobility programmes, total number of incoming trainers and lecturers in mobility programmes.

There is no organisational unit on the university level responsible for internationalisation. Instead, this responsibility is distributed across the appropriate vice-rectorate and all institutes and there are convincing and active communication lines across all positions addressing internationalisation (M).

Most notable is the tangibly positive atmosphere that encourages international mobility of students and teaching staff, supporting the development of learning, teaching and RDC activities, as well as the cultural openness of its members (M, T, S).

TTK is well-established in international networks (e.g., EURASHE, UAS4EUROPE) and various domain-specific networks. Formally, there are 91 ERASMUS+ agreements across Europe and, to a lesser degree, outside the ERASMUS+ area (SER). There is, however, no indication as to the intensity or quality of these relationships. In its Strategic Plan the university states its intention to further develop its international relationships yet does not provide information on specific measures and activities to be taken (M).

Students are well informed about opportunities for mobility ranging from general information to individual counselling; it seems, still, that despite the efforts of the university some student members see no need for or are even afraid of international exposure (S). TTK has identified the major obstacles for long and medium-size international activity and intends to strengthen short-term international mobility which is then integrated into field trips and/or joint teaching activities (M). The development of virtual international experiences could be explored further.

The regulations governing the transfer of credits into the local programmes conform to European standards, making use of ECTS instruments, e.g. Learning Agreements (S, SER). The applicable regulation is convincingly laid down in the document 'The Conditions and Procedure of Recognition of Prior Learning and Work Experience'. Since usually the curriculum managers are well involved in a study abroad activity both transfer of credits and subsequent adaptation of individual study plans seem to work seamlessly (S).

There is a significant effort to accommodate international incoming students, by an ample supply of modules taught in English and also comprehensive mentoring. (SER) Such modules are also available for local students; there are, however, no compulsory English-taught module included in the regular study programmes (M). The latter would help students to overcome their ever-present shyness to use the English language in an academic setting.

TTK focuses considerably on the participation of staff members in international projects with impressive numbers in staff mobility (before Covid 239), although variable across the programmes. Notably, an in-house and in-service training 'Teaching in English' is offered in addition (SER, M).

TTK extensively integrates foreign experts into their teaching activity and thereby creates a local international atmosphere. There is an effort to focus on the longer-term inclusion of foreign visiting lecturers in the study process (SER).

Considering the weaknesses spotted in the detailed analysis of the sample programmes, the panel recommends to further enhance internationalisation throughout the institution and create a portfolio of internationalisation activities appropriate for the different programmes and ensuring an international outlook in all curricula and development of international competencies for all students.

Conclusion

TTK complies with the requirements of Standard 1.5 'Internationalisation' as all the aspects in the standard definition and applicable guidelines have been addressed convincingly. A tangibly positive atmosphere encourages international mobility of students and teaching staff and TTK is well-

established in international networks. As mentioned in Standard 1, the Panel recommends creating better visibility for internationalisation at the university level in order to support a strategic punch for this matter and supply numbers quantifying goals in internationalisation.

Strengths

- Convincing atmosphere supporting internationalisation.

Areas of concern and recommendations

- In its Strategic Plan, TTK states its intention to further develop its international relationships. To foster this intention, TTK is recommended to provide information on specific measures and activities to be taken in this respect.
- Considering the weaknesses spotted in the detailed analysis of the sample programmes, the panel recommends to further enhance internationalisation throughout the institution and create a portfolio of internationalisation activities appropriate for the different programmes and ensuring an international outlook in all curricula and development of international competencies for all students.

Opportunities for further improvement

- TTK is encouraged to create better visibility for internationalisation on the university level to support strategic punch for this matter.
- TTK is encouraged to develop a system for the assessment of the quality and intensity of international relationships to other universities.
- TTK is encouraged to increase the number of virtual international experiences.
- To enhance the competencies of graduates, TTK is encouraged to include compulsory English-taught modules into the study programmes.

1.6 Teaching staff

Standard:
Teaching is conducted by a sufficient number of professionally competent members of the teaching staff who support the development of learners and value their own continuous self-development.

Guidelines:
Members of the teaching staff engage systemically in development of their professional and teaching skills, improve their supervision competence, and share best practices with one another.
Teaching staff's participation in research, development and/or creative activities supports the teaching process and ensures competence for the supervision of students' theses (including doctoral theses).
Members of the teaching staff collaborate in fields of teaching, research and/or creative work within the HEI and with partners outside the HEI, e.g. with field practitioners, public sector organisations, companies, other research and development institutions, and lecturers from other Estonian or foreign higher education institutions. Qualified visiting lecturers and practitioners participate in the teaching process.
When assessing the work of teaching staff (including their periodical evaluations), the effectiveness of their teaching as well as their research, development and creative work is taken into account, including student feedback, the effectiveness of their student supervision, development of their teaching and supervisory skills, their international mobility, and their entrepreneurial experience or other work experience in their fields of speciality outside the HEI.

Indicators:

• *Competition for elected academic positions*
• *Results of students' feedback about the teaching staff*
• *Teaching staff participating in continuing training or other forms of teaching skills development*

Evidence and analysis

The backbone for academic HR management is a series of documents relating to work organisation, academic positions, qualifications and duties, evaluations, and ethical principles and provides a sound basis for well-balanced staff management.

The age distribution is appropriate taking into consideration the focus on employees with professional experience and academic qualification (SER Table 7). The student/staff ratio was very good (about 22) until 2018, but significantly increased since 2019 due to the merger with LVRKK (about 27). The Panel encourages TTK to closely monitor this ratio and improve it back as much as possible.

For the development of skills and competencies, the Institution offers various types of training, the focus of which stems from students' feedback on courses, individual requirements and the need to adapt to changes. The average annual volume of training (SER Table 23) is positive with 14h dedicated to speciality training and 25h to pedagogical training. Besides training offers, active participation in international projects, conferences or teaching missions enables skills enhancement. The initiative of the Research Group on Didactics is particularly commended for their contribution to peer learning and the exchange of best practices across the academic staff including how to improve supervision competencies.

All staff is academically appropriately qualified for an institution with a focus on professional education. The level of students' satisfaction with lecturers' expertise and commitment is very high (S, A). The number of academic staff holding a doctoral degree (or equal qualification) remains stable (12%, SER Table 19) and could be improved to contribute to further research development.

The institution provides a career model which is based on competition or evaluation. The procedure is comprehensive and adequate. It consists of an annual meeting with the line management to discuss last year achievements and the next year plan. Every five-year, there is a formal appraisal procedure considering all aspects. In case of an exceptional situation, positive for promotion, or negative, an ad-hoc procedure can be launched anytime. In workload planning, self-development time is being considered besides teaching load, research and administrative tasks. Employees can take a sabbatical period, but this opportunity is still rarely used and TTK is encouraged to continue developing and incentivising short-term mobility periods instead. As a special incentive, TTK selects the Lecturer of the Year (selection is based on various parameters) which means both public recognition and monetary reward.

The recruitment and selection of academic staff procedures are described in a specific regulatory document, the QA of this field is fostered by quantitative indicators referring to competition of staff, staff turnover and share of visiting professors (SER). The competition for each position is rather low (SER Table 20) and TTK is encouraged to improve their visibility and attractiveness. The share of visiting lecturers has increased up to 10% (SER Table 22), which is positive to support internationalisation and field practitioner recruitment.

Conclusion

TTK complies with the requirements of Standard 1.6 'Teaching staff' with a comprehensive career management system particularly effective to evaluate and support the staff performance and professional development. The academic staff is qualified for the level of education and the level of student's satisfaction is very high.

Strengths

- The comprehensive career management system is particularly effective to evaluate and support staff performance and professional development.
- The age distribution among the academic staff is appropriate to ensure a sustainable coverage and development of teaching and research needs.
- The share of visiting lecturers is positive to support internationalisation and field practitioner recruitment.
- The average annual volume of training is positive with both speciality and pedagogical training.

Opportunities for further improvement

- TTK is encouraged to closely monitor the student/staff ratio and improve it as much as possible.
- The number of academic staff with a doctoral degree could be improved to further develop RDC capacities.
- The number of applications for each academic position is rather low and TTK is encouraged to improve their visibility and attractiveness.

1.7 Study programme

Standard:
Study programmes are designed and developed while taking into account the expectations of stakeholders, higher education and professional standards, and trends in the relevant fields. The objectives of study programmes, modules and courses and their planned learning outcomes are specific and coherent. The study programmes support creativity, entrepreneurship and development of other general competencies.

Guidelines:
In planning study programmes and student places, the HEI pursues its objectives and the needs of the labour market and takes into account national strategies and the expectations of society. The planned learning outcomes are in accord with the requirements for the corresponding level of the Estonian Qualifications Framework.
Expected student workloads defined in the study programmes are realistic and consistent with the calculation that 1 ECTS credit equals 26 student learning hours.
Theoretical learning and practical learning are interconnected. The content and organisation of practical trainings support the achievement of learning outcomes of the study programme and meet the needs of all parties.

Evidence and analysis

From the SER, it was observed that the basis for planning and developing as well as reviewing curricula are the Curriculum Statutes which provide clear descriptions of requirements for the development process, the structure, the compliance with the NQF, QA as well as study organisation. This was confirmed in interviews (M), particularly with the vice-rector for academic affairs, and with the Programme Managers.

From the SER and other provided materials, it was observed that the programme description comprises all relevant information such as programme objectives, duration and attributed ECTS, as well as programme and module learning outcomes. When reviewing the detailed information on the sample programmes, the Panel observed different levels of maturity in this regard and recommend professionalising and harmonising the description of learning outcomes and their assessment. From interviews (T, S, A), it became clear that the feedback cycles for PDCA are short, and that any discrepancies between the needs of the labour market, the learning outcomes and the learning methods are managed smoothly and noticeably short cycles. This is a strength, however, it bears the risk of looking only at immediate demands and clear goals, while potentially missing the larger strategic changes.

Responsibilities for curriculum administration, QA and supervision are transparent and clear (SER, M). The institution has defined KPIs for curriculum monitoring (SER). In the interviews (M, T), the panel gained evidence that the monitoring is operating well, even though the exact KPIs and overarching strategic goals were not so much on the radar. This shows a particularly good operational practice that mirrors the strategic plan, though a slightly higher awareness of the strategic goals in the operations could be strengthened.

Interviews with all stakeholder groups (E, S, T, A), provided an impressive insight into how good TTK answers to the immediate and acute demands for well-trained higher education graduates. External companies are on the Advisory Board of TTK which has a firm role and clear profile when it comes to aligning the industrial needs, particularly from more technical industries, with the strategic development of TTK. The industry representatives also expressed their satisfaction with the way this is implemented.

Study programmes have relevant industry boards with strong involvement in the programmes, according to the board members interviewed (E).

In the interviews (E, A, M, T), the panel gained unambiguous evidence that programme management and membership have good contact with future employers. Companies as future employers can work with the university on all levels, including involvement of company members as external teachers, alumni giving back advice to the current students and strategic outlook through the involvement of more senior management.

There is a historical hyper specialisation across the curricula (M, E), leading to a silo effect in many programmes. Thus, more clustered collaborations with unified parts are planned, to harmonise quality and academic climate throughout the programmes.

The objectives of study programmes, modules and courses and their planned learning outcomes are mostly specific and coherent, but not always up to date with a more international outlook. In the interviews (M, E, T), it became clear that the topic of internationalisation for the design of the study programmes is something that engages, but that the format needs to further crystallise.

According to the written material (SER), study programmes support creativity, entrepreneurship and the development of general competencies. In the interviews, it was convincingly explained how entrepreneurship and general competencies are implemented in teaching and learning. Creativity is present, but less clear in terms of design and thinking new. There is a laser-sharp focus on employability with currently needed expertise. This could, however, come at the expense of more free creativity for future engineers.

National strategies are brought in via the process of the development of the Strategic Plan, in which 'Trends' are to be understood as development goals (M). The development of the Strategic Plan happened in an open process up and down the institution, including rounds with the ministry and various stakeholders.

The expected student workload defined in the study programmes is realistic and consistent with the calculation that 1 ECTS credit equals 26 average student learning hours. Monitoring of the workload is done through feedback to teachers (T, S). Students feel that they can give this feedback and that the teachers listen to them.

Theoretical learning and practical learning are intertwined particularly where project-based learning is used (M, T, S). The content and organisation of practical training support the achievement of learning outcomes of the study programme and meet the needs of all parties.

Practical training and learning are organised with industry in the loop. The management of connecting to the learning goals is very concrete and very hands-on. Cooperation with industry and the programmes is very close, the needs of the industry are well-considered and its expectations clearly

met as was confirmed in the interviews (E, A). There is a process of programme evaluation by young engineers who graduated recently from the programmes.

The involvement of research in the design of the study programmes is evolving. Not all areas have mature research programmes but for those that do have it, there are signs (M, T) that students are involved in these projects. The industry does see this differently: the growth of the volume in research improves the quality of teaching. During the interviews (E, A), the Panel gained limited evidence of the industry seeing its own role in building up the research environment or cooperation, this is an area for further improvement.

Conclusion

TTK complies with the requirements of Standard 1.7 'Study programme' as the Panel gathered evidence that the study programmes are designed and developed with the cooperation of stakeholders and take the professional standards into consideration.

Strengths

- The industry input in the programmes and university management, the connections between students and industry and the design of the labs to the demands of industry are exemplary.
- There is a strong focus on the employability of the alumni, currently resulting in remarkably high employability.

Areas of concern and recommendations

- When reviewing the detailed information on the sample programmes, the Panel observed different levels of maturity of the programme and module descriptors and recommend professionalising and harmonising the description of learning outcomes and their assessment.

Opportunities for further improvement

- TTK is encouraged to pay further attention to the creativity component to provide a bit wider definition than the very applied engineering view that appears dominant.
- TTK is encouraged to use more influence of non-industrial stakeholders, as engineers also shape the world and are not just workforce into a defined industry profile.
- TTK is encouraged to work more with the industries of the region to increase the research volume, enhance the research culture at TTK and thus further strengthen the educational programmes.
- While currently well aligned, a more explicit awareness of strategic goals on the operational level could ensure a longer-term stability of the development path of TTK.

1.8 Learning and teaching

Standard:
Admissions requirements and procedures ensure fair access to higher education and the formation of a motivated student body. The higher education institution systemically implements a student-centred approach that guides students to take responsibility for their studies and career planning and supports creativity and innovation. Graduates of the higher education institution, with their professional knowledge and social skills, are competitive both nationally and internationally.

Guidelines:
The teaching process takes into account students' individual abilities and needs and supports their development. Organisation of independent work and classroom teaching motivates students to take responsibility for their studies.
Teaching methods and learning aids used in the teaching process are modern, appropriate, and effective, and support development of a digital culture.
Students are motivated to learn and contribute to improving the quality of their studies by providing meaningful feedback on both the learning process and the organisation of studies.
Doctoral students plan their studies, as well as their research and development activities, in collaboration with their supervisor(s), setting specific objectives for each year and assuming responsibility for achieving those objectives.

Indicators:
*   *Student satisfaction with the content and organisation of studies*
*   *Alumni satisfaction with the quality of studies*
*   *Employer satisfaction with the preparation of the graduates*

Evidence and analysis

Admission to TTK's study programmes is regulated and documented in three regulatory documents (SER) and published on the institutional webpage. These regulations comply with the national and international requirements for admission to Higher Education and ensure equal access to studies. In addition to an adequate school leaving certificate (national or international), and an average grade score of secondary education, candidates may be asked to deliver practical work or an admission test, depending on the focus of the curriculum. Preparatory courses are offered for those candidates whose average grade score does not yet meet the threshold level, a fact that the Panel sees as a fair chance given to study candidates to even out possible weaknesses and develop their potential. Applicants are ranked according to achieved points, additional points may be gained by sitting for a TTK's academic test or by work experience in the respective speciality field. All relevant information is transparent and easily accessible.

Students' feedback on the admission process is gathered through the annual '*Admissions arrangements and induction survey'* (QM–Handbook), the analysis of which leads to continuous process improvement. As one of the major improvement measures which TTK implemented for 2021 admission the above-mentioned Academic Test as well as an admission interview, both to be taken voluntarily, were introduced. As this measure has so far had a positive impact on drop-outs due to wrong study decisions or pro-forma applications, TTK intends to implement both as mandatory for next year's admission. Students confirmed in the interviews (S) that they are in favour of these

measures as they help them to reflect more intensively on programme choices. The Panel appreciates these measures as they help decrease the TTK drop-out rate.

The number of students to be admitted per study year depends on available resources, activity support and the institutional Strategic Plan, an approach that the Panel considers appropriate to ensure the quality of studies, even though in interviews with employers it was mentioned that more students should be admitted as the national labour market was in heavy need of well-educated specialists in almost all study fields that TTK covers.

Studies at TKK are offered in three formats (full-time, part-time, and distance studies) which means providing study opportunities according to students' personal needs and circumstances. Particularly the online study offers were mentioned by students as a good way to combine studying with private and work obligations and to allow flexible learning paths. The organisation of studies at TKK is regulated by the '*TTK-Study Regulations*', complemented by several other documents such as '*Guidelines and Procedure Regulations*' (Study Regulations 1.4) and published on the institutional website.

Relevant information on curricula is recorded in the study information system. Besides theoretical subjects, curricula comprise practical training as integral parts (according to the respective legal provisions), final theses and a final exam. Practical training can be done abroad just like study periods; both options help students acquire international experiences and competencies and thus get internationally competitive. In addition to these options projects with international partners or internationally active companies bring in an international perspective so that graduates can successfully perform in an international environment or national companies with an international focus. The high employment rate of graduates, alumni's satisfaction with the education received (collected regularly through the alumni satisfaction survey) as well as the satisfaction of employers with TTK graduates having been ascertained in the interviews (E, A) prove that TTK graduates are competitive both nationally and internationally.

TKK's Strategic Plan 2021–2025 stipulates '*A modern approach to teaching*' as one strategic goal focusing on the development of creativity, collaboration, and social skills through teaching methods that foster personal skills and self-management. Thus, TTK pays attention to developing students' self-competency skills (SER) already in the first year, particularly with regards to time management and working independently. Furthermore, communication, collaboration, and critical thinking (skills of the 21st century), are fostered through specific courses and integrated also in general courses. In the programme interviews, students confirmed that personal development was strongly taken into consideration in their studies.

TTK's approach to teaching is based on active, interactive, and independent learning and student-centeredness; according to the SER as well as statements in the interviews (S, T), flipped classroom, problem-based and project-based learning in cooperation with companies, group-work and lab work support this student-centeredness. Teachers are free to choose 'their' teaching and learning methods according to the focus of the course they teach. As the Panel learned in the interviews (M), the unit director takes a monitoring role in this process, and teachers cooperate and exchange good practices to find the appropriate teaching method and further develop their teaching skills. With the implementation of a 13-member-strong Research Group on Didactics TTK has taken a big step towards further development of modern teaching and learning methods. The interviews gave evidence that teachers value the training offered and organised, use various channels and platforms to exchange

experiences and learn from each other and are courageous in trying new teaching methods. The equally newly installed Centre for Innovation and Entrepreneurship (CIE) will also contribute to fostering teachers' competence enhancement as well as innovative and entrepreneurial skills' development in the programmes. Furthermore, the panel learned that the CIE intends to strengthen cooperation with companies to allow involvement of all students in research-oriented projects (S). The participation of staff in training activities is satisfactory, and the Panel learned that the Research Group will take efforts to increase the participation rate through webinars and similar offers. The Panel finds that the implementation of the Research Group as well as of the CIE are commendable initiatives to foster the constant quality enhancement of teaching and learning of TTK and help to achieve the strategic target of *a modern approach to teaching*.

To support independent learning, TKK uses online tools (such as Moodle) as well as online supervision, checking and feedbacking. The growing percentage of online study users proves that this offer is well accepted and contributes to developing students' digital competence and digital culture within the institution. In the interviews, students expressed their satisfaction with the growing number and the quality of online courses as thus flexible learning becomes easier. They would, however, also appreciate more international online learning opportunities as substitute for physical mobility.

TTK uses various regularly conducted feedback surveys (QM-Handbook 3.3.) to collect students' opinions and evaluation of studies and study-related services. Furthermore, students have a voice in curriculum councils and other decision-taking bodies of the institution as equal members. Whereas the feedback score as to the organisation of studies attains an average value, the subject monitoring survey shows high student satisfaction over the years. Both Student Council members and students confirmed that their feedback was taken into consideration and that their voice was heard and taken seriously and mentioned examples to give evidence to their statements.

Despite a subtle overall satisfaction of students, programme interviews revealed that there are still differences in the quality approach between the institutes and the programmes as well as in the interpretation of quality, which could be amended by actively fostering peer-learning between institutes and programmes.

The employment level of graduates has remained high over the years and alumni are well received by the labour market; their input to curriculum development comes through the annual alumni feedback survey. The Panel finds that a feedback response rate of 90% (SER) from alumni demonstrates their high satisfaction with their studies and their strong commitment to the quality enhancement of TTK educational offers. Feedback from employers stems from Advisory Board members, internship supervisors and professional organisations. Employers are very satisfied both with the practice-oriented education and the preparation of TTK students for the labour market and spoke appreciatively about graduates and TTK as a hub for the education of highly competent specialists (Advisory Board members).

Conclusion

TTK complies with the requirements of Standard 1.8 'Learning and teaching' as admission to programmes is clearly regulated and documented, admission processes are continuously improved based on feedback surveys and analysis of features linked to the admission, such as drop-out rates and study motivation. The teaching staff is highly committed to the further development of teaching methods and personal teaching competencies. Student feedback is taken into consideration when it

comes to defining improvement measures. Continuous and diligent monitoring of teaching through the Director of an Institute ensures equal learning opportunities for students and compliance with TTK's quality principles on the unit level.

Strengths

- Teaching staff that is highly committed to student-centeredness and further development of teaching competences.
- Input from various stakeholders as to needs for teaching and learning is manifold and well-considered in improvement measures.
- The newly implemented Research Group on Didactics and the Centre for Innovation and Entrepreneurship are valuable initiatives for continuous improvement, the implementation of the research group is even worthy of recognition.

Opportunities for further improvement

- TTK is encouraged to foster comparison and peer-learning between institutes and programmes to even out differences in quality approach (mentioned in the programme interviews).
- TTK is encouraged to foster further digitalisation of cross-country teaching and learning to enhance international learning opportunities for all students.
- TTK is encouraged to strengthen cooperation with companies for common research projects and include all students (not only the most talented ones) in real-life and research-oriented projects.

1.9 Student assessment

Standard:
Assessments of students, including recognition of their prior learning and work experiences, support the process of learning and are consistent with expected learning outcomes. The objectivity and reliability of student assessments are ensured.

Guidelines:
The assessment criteria are understandable to students and students are informed about them in a timely manner. Members of the teaching staff cooperate in defining assessment criteria and apply similar approaches.
Assessment methods are versatile and relevant, and assess the degree of achievement of learning outcomes (including general competencies).
If possible, more than one staff member is involved in the development of assessment tasks and student assessments. Along with assessments, students receive feedback that supports their individual development. The HEI supports development of the teaching staff's assessment competencies.
Evaluation of doctoral students is transparent and impartial. Its purpose is to support the development of doctoral students, to assess the effectiveness of their current work and to evaluate their ability to complete the doctoral studies on time and successfully defend their doctoral theses.
When recognising prior learning and work experience towards the completion of the study programme, results obtained through the studies and work experiences (the achieved learning outcomes) are assessed.
Students are aware of their rights and obligations, including the procedures for challenges regarding assessments.

Indicator:

The number of credit points applied for and awarded under the accreditation of prior and experiential learning scheme (APEL); this does not include credit points transferred from a different study programme at the same HEI.

Evidence and analysis

Student assessments are based on TTK UAS' Student Regulations (SER). This assessment system conforms to the national regulations. Students are informed about assessment methods, criteria and how these are linked to learning outcomes, but not consistently throughout all programmes, as the panel was informed during the interviews. Therefore, the panel recommends encouraging staff to integrate information on assessment as well as an explanation of learning outcomes into their teaching. As was confirmed in the interviews (S) information on assessment and learning outcomes can be found in the Tahvel systems yet explanation might be useful to raise understanding and awareness.

The Office of Academic Affairs determines when the assessments take place, but the report does not specify the number of staff members involved in developing the assessment task. The report states that 'the academic staff member teaching the subject sets out the guidelines for completing the exam', meaning that if a subject is taught by more than one staff member it is possible that more than one staff member is involved in the development of student assessments. If a subject is taught by only one staff member, then the assessment is developed by this member alone (SER). However, In the

interviews the panel was informed that staff members more than often cooperate in setting up exam formats and the development of students' assessment as they appreciate learning from each other.

The institution supports the communication among teachers on assessment methods in order to improve their assessment competence. Assessment methods are versatile and relevant as the panel found during interviews with the teaching staff (T), yet largely depend on the subject to be assessed. As much as possible, teachers use various formats in one course thus covering all (most) competences to be assessed. These assessment forms range from individual exams to group work, from project involvement to case-studies and problem-based assessments. Students expressed their satisfaction with the varied methods, as these capture well their different strengths.

The panel also found that the terms assessment 'methods and criteria' are somehow intermingled and therefore recommends distinguishing clearly between method (e.g. written test) and 'criteria'/level of achievement of Learning outcomes.

The general competence of students developed through courses and documented achievement through assessments is very high. That is proven by the high rate and successful employment after graduation from TTK (above 90%) (SER).

Students receive oral and written feedback on assessment after a course has ended. It is personalised and focused on his/her improvement potential for the future. Feedback is taken very seriously keeping in mind individual development (SER). The panel found during the interviews with students that they were also pleased with the level of feedback they are given from their teachers (S).

All written work must be checked by the plagiarism identification system Urkund (SER). Students are aware of this process and are taught how to use this system themselves. Students also have a good understanding on their right to appeal assessment (S). Students can appeal their assessments by submitting an appeal to the Director of the Institute (SER).

TTK UAS' recognises prior work and learning experiences towards completion of the study programme. This is regulated in the document 'Conditions and Procedure of Recognition of Prior Learning and Work Experience' which is available on the university website (SER). This process is known to students, they use it widely (S) and appreciate it.

Conclusion

TTK has an adequate document for student assessments based on national regulations. The Office of Academic Affairs determines when the assessments take place. Students get sufficient feedback from staff members orally and in writing. The HEI supports its teachers in further developing their assessment competencies. TTK has a strict plagiarism identification system in place that the students are well aware of. If a student wants to appeal his/her assessment they can do so. Recognition of prior learning and work experience is regulated with a corresponding document available on TTK's website.

Areas of concern and recommendations

- Students are informed about assessment methods, criteria and how these are linked to learning outcomes, but not consistently throughout all programmes, as the panel was informed during the interviews. The panel recommends encouraging staff to consistently

explain assessment methods and criteria at the beginning of each course as well as the linkage to learning outcomes.

- The panel also found that the terms assessment 'methods and criteria' are somehow intermingled and therefore recommends clearly distinguishing between assessment methods and assessment criteria in the course descriptions.

1.10 Learning support systems

Standard:
The higher education institution ensures that all students have access to academic, career and psychological counselling. Students' individual development and academic progress are monitored and supported.

Guidelines:
The HEI assists the student in developing an individual study programme based on the student's special needs as well as educational abilities and preferences.
The HEI advises its students (including students with special needs and international students) on finding practical training places as well as jobs. Students are aware of where to get support in the case of psychological problems.
The HEI has a functioning system to support and advise international students (including psychological and career counselling) which, inter alia, helps them integrate smoothly into the membership of the HEI and Estonian society. The HEI analyses the reasons students withdraw from studies or drop out and takes steps to increase the effectiveness of the studies.

The HEI supports student participation in extra-curricular activities and civil society initiatives.
The HEI monitors student satisfaction with the counselling services provided and makes changes as needed.

Indicators:
• *The average duration of the study by levels of study*
• *Dropout/withdrawal rate*

Evidence and analysis

TTK has set as one of its strategic goals to support each students' individual development (SER). Thus, the institution has designed its curricula in a way that students can pick specialisation electives as part of their study programme. There is a wide range of electives to choose from offered by the institution but when trying to manage them into students' timetables very often problems arise (S). In the interviews the panel learned that TTK is aware of this problem and is working towards alleviating it (T, M) through closer cooperation and coordination across programmes and institutes. The panel encourages TTK to further enhance this issue and offer more options for students to design their learning path.

Furthermore, programmes are offered in different formats – full-time, part-time and distance learning, so that students can align their study times to work or other obligations they might have (SER). Distance learning options have been greatly expanded as they are highly appreciated particularly amongst students who are working alongside studying (S). The panel appreciates TTK's agility in this respect as it creates opportunities for all learners and corresponds to TTK's strategic goal of creating learning paths for all students. Students can also participate in research groups, in national and international projects as well as national and international competitions, all of which help students develop their creative competencies and personal skills. One of the most highly talked about projects amongst students is Formula Student (S), a national inter-university development project. Social competencies are developed through active involvement in the Student Council or activities offered by the council and the student corporation Ericius. TTK also offers extra-curricular activities for students, such as various hobby groups, participation in folklore dance groups, a chamber choir,

and sports teams (SER, S). All these activities support students in their personal development and create an environment of well-being. The panel was confirmed in the interviews, that students consider these activities essential for the cohesiveness of the student body and the integration of students coming from abroad. Furthermore, together with the various counselling offers (see below) and the good relationship between teachers and students, TTK creates an atmosphere where students feel that they are well taken care of. (S). as was appreciatively mentioned in the interviews (S).

Counselling is provided in various ways and for various situations, ranging from admission advice to career counselling. This approach provides individuality and valuable support for studying and meets TTK's aspiration to support students' academic success and individual development. All relevant information is published on TTK's webpage and students are aware of where to find this information (S).

The institution offers psychological counselling provided by two of their own lecturers and students can choose which one of them they would like to talk with. Both staff members are qualified to support students in promoting mental health. A special room has been attributed to conduct these counselling sessions, but if the student feels more comfortable counselling may also be done via Zoom (S). As was mentioned in an interview (T), every year the number of students who use this opportunity due to difficulties and needs rises. In addition, counselling from TTK's lawyer is provided in case of legal questions (SER, S).

TTK monitors how many times a year on average students use counselling opportunities. According to the Student Satisfaction Survey of the last four years (SER), students are quite satisfied with the counselling they can get, they are also satisfied with the student life and the ambience at TTK. The panel gained convincing evidence of this fact through the interviews with the students and alumni alike.

International students are supported by special tutors who offer multiple support services ranging from orientation and integration events. Furthermore, the institutional ERASMUS coordinator acts as a counsellor for incoming and outgoing students; for the latter information on mobility options – studying as well as an internship – is provided (SER, S, T).

As internships are integral parts of TTK curricula, an assigned practical training supervisor for each practical training, supports students in finding internships places if necessary and provides relevant information on requirements to be fulfilled. During an information day, TTK informs its freshmen about the most popular internship places that students had chosen in earlier years (SER). Employers also communicate their announcements for open internships via the institution's announcement board, and students can directly contact them (E). The feedback on internships was highly positive on both sides and many students continued to work besides studying after their internship has finished (S, E). In the interviews the panel got evidence that TTK provides help in finding appropriate internships and that the practical experience students can gain during their studies is seen as an asset of TTK both from students, alumni and employers.

TTK offers scholarships and allowances as financial support for its students in various forms. The institute offers 100 euros a month for five months for excellent study outcomes; In the Building Construction programme studying full-time is rewarded with a monthly allowance, since this is a priority issue for the state and the scholarship is aimed to motivate students to continue with their studies. Students who come from disadvantaged families have the possibility to apply for a need-

based education allowance from the state. TKK also issues an 'active student of the year' scholarship every year to reward the student who has stood out of the crowd through participation in studies, research work, development, creative work, sports, or service to society. In addition, several companies give out their own scholarships to further motivate students to keep on with their studies (SER, E).

TTK has taken actions to decrease the number of dropouts in the last few years. As the most common reason for dropping out from studies was 'unsuitable speciality' according to the respective survey, TTK has paid special attention when introducing specialities. In addition, TTK has also enhanced admission rules, increased efficiency of analyses methods, introduced e-support for subjects and enhanced counselling offers through the creation of the position of academic Affairs Specialists (SER). With the admission of 2021, TTK started offering an academic test for applicants to gain extra points during admission (M). This test showed a positive impact on the number of dropouts, and clearly showed the difference between those having taken the test and those that have not: Only a few amongst the people who took the test dropped out this year, as was confirmed by the academic staff during the interviews. Apart from the academic test, the institution also has carried out admission interviews, to clarify expectations on both sides. (T). As both measures proved to be successful, they will be implemented as mandatory for the upcoming admission period (T, M). Furthermore, TTK is carrying out interviews with every first-year student to try and filter out students in the "red-zone" as soon as possible (M). The panel considers the introduction of the academic test and the admission interview as well as first year interviews as well chosen means and measures to reduce drop-out rates and encourages TTK to keep implementing them in the further years. TTK strives to reach the national average of 11% drop-out per year within 3-5 years (documented in the 5-year Strategic Plan) - a goal which the Panel found to be very reasonable within the given period and with the measures determined. Currently, the drop-out rate per year is 14,5% (SER).

For module descriptors, timetables and curricula, the institution uses the Tahvel system which, however, has received some negative feedback from students (SER) due to technical problems. This issue, however, has now been resolved. During the interviews, the Panel learned that the IT staff is working hard along with the teaching staff to further advance the Moodle learning system and to make it more user friendly and provide sufficient e-support for users

Conclusion

TTK complies with the requirements of Standard 1.10 'Learning support systems' since TTK offers support to students in many different forms: psychological counselling, counselling from the institution's lawyer, scholarships, admissions advice, career counselling and ERASMUS advice. TTK programmes have a wide range of electives for students to choose from. The institution offers its programmes in three study forms – full-time, part-time and distance learning.

Strengths

- The newly introduced interviews with first-year students to determine yellow/red zone students from the very beginning.
- The rich offer of online studies caters well for students' needs as to managing work, family and studying at the same time.
- The personal and caring atmosphere that TTK provides to its students.

1.11 Research, development and/or other creative activity

> **Standard:**
> The higher education institution has defined its objectives and focus in the fields of RDC based on its mission, as well as on the expectations and future needs of society, and assesses their implementation and the societal impact of its RDC activities. RDC supports the process of teaching and learning at the higher education institution. Support services for RDC are purposeful and support implementation of the objectives of the core process.
>
> *Guidelines:*
> *The HEI places a high value on the role and responsibilities of the field of RDC in society and evaluates the results of its RDC activities, their international visibility and societal impact.*
> *The HEI responds flexibly to the current needs of society and the labour market in terms of its research and plans its research in collaboration with enterprises, public sector institutions and organisations of the third sector.*
> *Members of teaching staff introduce students to their research results as well as the latest scientific achievements in their areas of specialisation and involve students in their R&D projects where possible.*
> *The organisation and management of RDC take into account thematic differences and the mission (profile) of the HEI.*
>
> *Indicators depend on the specificities of the HEI:*
> • *Numerical data: (1) scientific publications by classifiers; (2) public presentations of creative work; recognition from international competitions; reviews in professional publications, etc.; (3) patent applications, patents; (4) textbooks, study aids of various formats, etc.; (5) system development solutions; product development solutions; environmental applications solutions; (6) contracts concluded with enterprises; (7) spin-off companies, etc., in line with the profile and priorities of the HEI; etc.*
> • *Number of scientific publications / creative works per member of academic staff and per employee with the requirement to do research (FTE, by areas)*
> • *Number and volume of externally funded projects of RDC activities*

Evidence and analysis

The work on RDC is in line with the institutional Strategic Plan and is implemented in several ways.

The strategic plan has formed the basis for an action plan such as the upskilling of teaching staff through research, strengthened problem-based learning for students through project work, which is often anchored in the surrounding society and industry. This approach has been cited in the self-assessment and has been substantiated in connection with interviews by employers and graduated students. Teachers have stated that the balance between research and teaching is good, while increased funding for research is desirable. Interviews with employers show that the training programmes meet the needs of industry. Furthermore, alumni claim that completed project course at the programme has contributed to strengthened creativity and provided the ability to independently search for knowledge and information.

In order to strengthen RDC, several research groups have been formed to, among other things, achieve critical mass. These research groups are interdisciplinary in nature, enabling RDC to address broader

issues with high industrial relevance. The research groups are coordinated by the Professor Board. The RDC is usually carried out in collaboration with companies, in particular, to strengthen their competitiveness. Recently, increased efforts have been made to help companies implement green technologies. Another part of this collaboration is to carry out various types of experimental testing and feasibility studies. This type of service can be expected to increase as the university makes specific marketing efforts in this area, including strengthening both budget and resource utilisation and increasing technology diffusion to surrounding companies. These claims are supported by reported self-assessment but have also been verified through interviews with staff at various levels within the University. Overall, the volume of research remains fair and could be increased, also to employ more teachers or researchers, which will in turn reduce the ratio of students to teachers.

The interviews (M, T) revealed that RDC is an important tool for teachers' professional development, which also contributes to a stronger research link in education. Students are sometimes directly involved in RDC activities in the form of sub-projects although this is very variable across the programmes. It has also been found that several teachers run and participate in EU-funded projects. Through these projects, further contacts are established with companies and with international institutes and academies. To support the teachers, TTK has developed a framework for the implementation of research and research assignments from the industry. A special unit, the 'Centre for Innovation and Entrepreneurship' acts as a link between teachers and companies. This unit checks that the documents are correct and that they are filed for later follow-up. The cooperation on postgraduate education with TalTech is very valuable and contributes to strengthened research and, in the long run, also to an increased number of PhD teachers.

The University encourages teachers to increase the proportion of RDC, for example through project applications and assignments from the industry. These activities become part of the job description and are included in the workload agreement. It is common that commitments linked to RDC also contribute to a substantially higher salary. Other incentives for increased RDC include the showcasing of the best research results of the year at a science festival where the authors also receive awards.

Conclusion

TTK complies with the requirements of Standard 1.11 'Research, development and/or other creative activity' with a well-developed infrastructure, its efficient use and interdisciplinary research groups. The extent of RDC is relatively low and varies greatly between teachers. An increase in volume in this area is essential to ensure long-term sustainability. A key issue is also to secure core funding for RDC.

The panel sees it as very positive that the university offers its services directly to industry. The initiative contributes at least to 4 important factors, increased industrial benefits, strengthened insights into industry needs that can improve education and provide ways for teachers' skills development, financial incentives and increased occupancy in research equipment, and also gives students the opportunity to get in touch with industry early. The extension of these posts also provides new opportunities to increase the proportion of teachers involved in research and development. Service development also provides an additional indicator of the volume of RDC, especially if students are involved in this outreach function.

Strengths

- Efficient use of resources in the form of integrated laboratories will benefit both RDC and teaching.
- Formation of research groups of an interdisciplinary nature.

Areas of concern and recommendations:

- Overall, the volume of research remains fair and could be increased; thus, the panel recommends also to employ more teachers or researchers, which will in turn reduce the ratio of students to teachers.
- A plan needs to be drawn up to strengthen funding for increased research and thus create an increased applied research volume that involves more teachers, and which in the long term also ensures the development of RDC.

Opportunities for further improvement

- TTK is encouraged to continue and intensify efforts to market the University's RDC services to the industry.
- TTK is encouraged to create additional incentives for as many teachers as possible to engage in RDC.
- TTK is encouraged to regularly monitor the evolution of the volume of RDC and use this monitoring to support decision-making on actions that support progress on the issue at hand.
- TTK is encouraged to involve their students in research projects in all programmes.

1.12 Service to society

Standard:
The higher education institution initiates and implements development activities, which enhance prosperity in the community and disseminate recent know-how in the areas of the institution's competence. The higher education institution, as a learning-oriented organisation, promotes lifelong learning in society and creates high-quality opportunities for that.

Guidelines:
The HEI contributes to the development of the community's well-being by sharing its resources (library, museums, sports facilities, etc.), by providing consulting and advisory services, and by organising concerts, exhibitions, shows, conferences, fairs and other events.
The HEI involves alumni in activities aimed at the development of the HEI and the knowledge society.
Employees of the HEI participate in the work of professional associations and in other community councils and decision-making bodies as experts, directing society's development processes as opinion leaders. The impact academic employees have on society is taken into account when evaluating their work.
The HEI has defined the objectives for in-service training and measures their implementation. In-service training is planned in accordance with the needs of target groups.

Indicators:
•   Number of people in continuing training (and other privately financed open forms of study), number of lessons or ECTS per participant

Evidence and analysis

Service to society is one of the institution's core processes comprising the organisation of life-long learning, of services and events for the public, and the participation in the work of associations and networks (QM Handbook). The related strategic goal set out in the Strategic Plan and underpinned by a set of courses of action is to be a cooperative partner for the target groups of the community and to promote the well-being and development of external stakeholders (SER). TTK translates this goal by helping promote informal and non-formal study and entrepreneurship and creating opportunities for technical innovation with its employees and infrastructure. The aim of promoting core activities is to attract speciality-aware and motivated students to degree studies who will act as drivers for innovation and development once graduated, and to introduce the in-service training courses and services provided to companies as scale-up activities for company employees. Participation in promotional and outreach activities is provided in the job descriptions of academic staff and thus evaluated in the staff evaluation process. The panel sees this as an important factor to encourage dissemination of staff knowledge.

As stated in the self-evaluation report (SER), to this end TTK arranges many high-level events targeted at the wider society. Alumni confirmed at the interviews their active involvement in the development of the university and therefore the knowledge society. Alumni are attracted mainly to curriculum development and practical training processes. Many of the visiting lecturers are TTK alumni. Also, the employers' representatives interviewed by the Panel were alumni and confirmed their continuous close cooperation with the University.

The lecturers and management participate in the work of international projects, professional associations and other community councils and decision-making bodies as experts, directing society's development processes as opinion leaders. Following an overview of the main activities targeted at the wider society by curricula has been compiled from the SER and re-confirmed by the university's management, teaching staff, students, alumni, and employers' representatives in the interviews.

As stated in the self-evaluation report and confirmed in the interviews, TTK employees actively contribute to raise the institution's contribution to society; thus, among others, AC curriculum lecturers have regularly led the organisation of financial training for county upper secondary schools and pupils in the framework of 'Global Money Week'. The NGOs MTÜ Mõdriku Arendusselts, MTÜ Ettevõtlusteater and Adult Educators' Club have been established at the initiative of the AC lecturers. Lecturers are involved in carrying out numerous projects such as 'Development of TTK Institute of Service Economy Internship Systems'; Nordplus projects: 'Empowerment by innovation – a must for inclusion', 'Entrepreneurial Mom Hub', 'Digi Care', 'Healing Greenery', Interreg project 'ActiveMoms' and 'Electronic Workbook of Cross Border Assignments from Estonian and Icelandic Companies (E-CBA)', and thus contribute to societal development but also gain personal experiences AC curriculum lecturers also participate in the work of cooperation networks and councils such as The European Accounting Association (EAA), ETNA network (non-governmental organisation in Estonia), to name a few. The panel sees this involvement of staff not only as contribution to society but also as important means to bring back professional developments to the institution.

Another example for contribution to society are the thematic days offered by BC curriculum lecturers and the in-service training offered. Lecturers' opinions on topical issues (e.g. modelling construction information, energy efficiency, technology systems) are covered in media publications, including the TTK blog and Facebook page. As an example of research, development and creative work, the 'Impact of heavy goods vehicles on bridges. Validation of their loads on basis of actual loads and impact analysis', was chosen as the best TTK lecturers' contractual research in 2019.

Like their AC curriculum colleagues, many BC curriculum lecturers also actively participate in speciality and professional associations and work of committees (e.g. EVS TK50, Building SMART Nordic, CEN WG215 BIM-working group; Architecture, Geomatics, Construction and Real Estate Professional Council; Professional committee of the Estonian Association of Civil Engineers etc). Good cooperation has been developed with state institutions (Road Administration, Riigi Kinnisvara AS – State Real Estate Company, State Forest Management Centre, etc.) and the Institute of Civil Engineering participates as a partner in the digital construction cluster.

A programme has been launched to introduce the specialities of the Institute of Civil Engineering and those of other institutes '100 steps in engineering'. As of November 2020, 155 workshops have taken place and 5700 students have participated. Between 2015–2020, three Goldberg machine construction competitions for forms 7–12 have taken place and three engineering career days.

Open Doors Days are organised at the university to introduce the ME curriculum, also social media channels (in cooperation with EML) are used to introduce the speciality and TTK homepage.

In the past three years, the Engineering Career Day was organised at TTK and the main organisers are the Institute of Logistics and the Institute of Civil Engineering. This has also been an important event for curriculum development because direct communication can provide information from entrepreneurs about future needs, and on what employers and the society at large expect. Every year,

the TL 3rd-year students organise a logistics seminar, which is the largest logistics seminar in Estonia. In spring 2020, 420 people participated in the seminar and about a third were company representatives. The logistics seminar has been organised ever since 2000.

According to the SER, TTK promotes and provides lifelong learning in all the university's study areas. Training activities proceed from the Adult Education Act and Lifelong Learning Strategy, organisation of training is regulated by the document 'Forms of In-service Training, Procedure of Conducting In-service Training and Quality Assurance'. Training curricula are developed at the institutes and centres based on labour market needs and considering future skills. Cooperation on training takes place with professional associations and the Qualifications Authority.

Widely offered in-service training has been developed based on study curricula, interest in these trainings is constantly growing and the overall volume of in-service training has increased in the past few years which fosters TTK's goal of promoting life-long learning. In-service training courses are carried out by TTK academic structural units both in Tallinn and in Mõdriku, the organisation is coordinated by the Office of Academic Affairs' training specialists. These courses target individuals, employees of enterprises and the university's alumni. According to the SER, the total number of in-service courses' graduates was 4474 persons between 2016-2020, with the busiest year being 2019 (1156 graduates).

In 2017, TTK joined the entrepreneurship environment platform ADAPTER, which brings together Estonian higher education institutions and research institutions. In the following years, TTK participated in and helped to organise several seminars and conferences directed at companies.

TTK organises exhibitions of well-known artists and the work of TTK architecture students in the entrance hall of the Tallinn study building, which is open to all visitors. TTK sports halls and exercise facilities are also open to society. In addition, TTK offers the possibility to use its main hall, conference hall, laboratories and other facilities for organising a diverse range of hobbies and undertakings. In 2019, TTK supported the organisation of the summer school course Women in Science (WiSci) STEAM Camp for Girls.

The strategic goals for the Mõdriku campus are to develop it into a regional continuous education and in-service training centre, as was learned from the interview with Advisory Board members.

The panel acknowledges the vast contribution and range of services of TTK to societal development and appreciates the inclusion of service to society issues in the staff evaluation process yet misses a targeted Service to Society Strategy to better "bundle" the institutional offers and create a basis for impact evaluation.

Conclusion

TTK complies with the requirements of Standard 1.12 'Service to society' as it offers and organises numerous events and services that enhance knowledge sharing and demonstrate TTK's expertise to the public; involvement of staff in professional networks and associations is regular and strong and taken into account in staff performance evaluations. Life-long learning opportunities are constantly developed, and in-service trainings contribute to competence up-scaling of company employees and alumni alike. Quantitative indicators are used for monitoring.

Strengths

- Well-known public events organised by TTK, like the annual 'Logistics Seminar' by the 3rd year TL students, the programme '100 steps in engineering' by the Institute of Civil Engineering or the financial training for county upper secondary schools and pupils in the framework of 'Global Money Week'.

Recommendation and Opportunities for further improvement

- As pointed out in Standard 1, the Panel encourages TTK to develop a Service to Society Strategy together with the RDC Strategy and also define indicators to evaluate the institution's societal impact as a whole.

2. Assessment findings of the sample of the study programmes

2.1.   Building Construction, Prof HE

The Bachelor in Building Construction is one of the four curriculums organised by the Institute of Civil Engineering. It is a four-year (240 ECTS) professional programme to train construction engineers (EQF level 6). Since 2016, the number of enrolled students has decreased little by little from 340 (2016) to 277 (2020) while the number of dropouts significantly decreased from 116 (2016) to 45 (2020) keeping the number of graduates unchanged, around 45 students per year. The curriculum is composed of general subjects (30 ECTS), core subjects (39 ECTS), speciality subjects (93 ECTS), elective subjects (24 ECTS), practical training (39 ECTS) and final thesis (15 ECTS). The programme is delivered in two formats, full-time studies or distance learning.

2.1.1 Planning and management of studies

- The design and development of study programme(s) take into account the expectations of students and other stakeholders, national strategies, legislation and trends in the particular area as well as labour market needs. The level and volume of RDC activities is sufficient and supports the launching of the study programme(s).
- The objectives of study programme(s), modules (including courses) and their learning outcomes are concrete and coherent. The teaching content and methods and assessment criteria and methods support students in achieving their learning outcomes and developing their key competencies. The study programmes support the development of creativity and entrepreneurship and other general competencies.
- The administration of material and financial resources that ensure the design and implementation of the study programme(s) is purposeful, systematic and sustainable. The learning environment, including materials, tools and technology support the students in achieving their learning outcomes.

Evidence and analysis

The programme in Building Construction is under the responsibility of the Curriculum Council composed of the Curriculum Coordinator, two representatives of the labour market, two lecturers and one student. The programme has been developed according to the occupational qualification standard 'Civil Engineer level 6' (SER). This sets a very good basis to ensure the fulfilment of the labour market's requirements. It is complemented with several contacts with industrial partners, either formally in the Curriculum Council or when collecting feedback about the final theses and internships.

The last major changes in the programme date from 2015 when the modules were redesigned to fit a 3–6 ECTS format. More recently, a new module dedicated to the 'Road and Square Planning' at the initiative of the Curriculum Council has been developed (M). During the meeting with the employers and Alumni (E, A), the Panel gained confirmation of the very high level of satisfaction about TTK

graduates' skills and competencies. Some very relevant suggestions, related to upgrading the training in BIM, sustainability, timber structures or project management have not yet been fully addressed. The Panel recommends the Institute of Civil Engineering extending the formal consultation to the external stakeholders (with a broader Advisory Board or with surveys) to make sure that the modifications have a possible large impact on the Estonian civil engineering industrial sector. This is particularly important for the ongoing process to reduce the duration of the studies to 3.5 years. This project is, for the moment, a top-down approach whose rationale is not very clear. Before implementing such a major change, the Institute should make sure that it will be beneficial to the quality of the education and in the interest of all stakeholders.

The Panel could also gather additional evidence of the very good alignment of the programme with the labour market (E, A). The Institute systematically collects feedback on the quality of the final thesis which reveals a very good level of satisfaction about the topics which are related to real-life case studies. The level of employment (SER2 Table 5 p. 36) is very satisfactory, close to 100% if the students continuing their studies with a master's degree are taken into account. The Panel also commends the fact that the programme is constantly benchmarked with TalTech to avoid duplications and to allow the graduates to possibly continue their studies at the master's level there.

RDC activities related to the programme of Building Construction are present, in various topics like Bridges, BIM, Building Physics or Retrofitting. The level and volume of these activities are, however, rather limited. During the interview with the employers and Alumni (E, A), the Panel could note a fair interest in developing RDC activities. In the programme, the research training is mostly concentrated on the final thesis. To better prepare their graduates to face contemporary challenges, the Panel recommends continuing expanding the research activities at the Institute and better train and integrate the students into the research projects, prior to the final thesis.

The objectives of the programme are coherent. The learning outcomes (LOs) are developed at the programme, module and course levels. Although the learning outcomes appear globally consistent, they are not adequately articulated, i.e. it is not clear how the course LOs feed the module LOs and then the programme LOs. Moreover, most of the learning outcomes are currently phrased with passive verbs (to know, to be aware, etc.) with sometimes vague contexts (SER). The Panel recommends the programme focusing on active verbs to better translate the intended skills and competencies and clarifying and narrow down the context. There is currently no procedure to systematically review the achievement of the learning outcome and it is recommended developing such a procedure to ensure the consistency of the learning outcomes, methods and assessment.

The learning environment is adequate. Through the videos provided (R) and the feedback received during the interviews (S, T), the Panel can confirm that the equipment and facilities available for the programme are operational and appropriate. There is some state-of-the-art equipment, e.g. 3D concrete printing. There is also an agreement to use TalTech equipment if needed, although it is not clear whether such visits are indeed organised with the students.

Strengths

- The final thesis topics are closely related to real-life case studies.
- The facilities, in particular the laboratories and the equipment, are well-equipped and relevant for the learning purpose.
- The programme is adequately benchmarked with TalTech to avoid duplication.

Areas of concern and recommendations

- Some very relevant suggestions, related to upgrading the training in BIM, sustainability, timber structures or project management have not yet been fully addressed. The Panel recommends the Institute of Civil Engineering extending the formal consultation to the external stakeholders (with a broader Advisory Board or with surveys) to make sure that the modifications have a possible large impact on the Estonian civil engineering industrial sector.
- There is currently no procedure to systematically review the achievement of the learning outcome and it is recommended developing such a procedure to ensure the consistency of the learning outcomes, methods, and assessment.
- Most of the learning outcomes are currently phrased with passive verbs (to know, to be aware, etc.) with sometimes vague contexts. The Panel recommends the programme focusing on active verbs to better translate the intended skills and competencies and clarifying and narrow down the context.

Opportunities for further improvement

- The Institute of Civil Engineering is encouraged to continue expanding the research activities at the Institute and better train and integrate the students into the research projects, prior to the final thesis.

2.1.2 Learning, teaching and assessment

- Conditions and organisation of admission ensure fair access to education and motivated student body. Students' choice of specialisation is supported.
- A student-centred approach is used in the studies, aiming at the students to assume responsibility for planning their studies and career and supporting the development of key competencies and achieving the learning outcomes of the study programme.
- Student assessment, including taking accreditation of prior and experiential learning into account, supports the students and corresponds to the learning outcomes. Objective and reliable assessment is ensured.
- The organisation of studies including practical work and training is based on the specificities of students and forms of study and supports the student in achieving the learning outcomes. Opportunities have been established for mobility within Estonia and internationally.
- Support services for students are in place and available for students. Individual development and progress of students are monitored and supported.
- Graduates of the study programme are competitive in terms of their knowledge and social skills both nationally and internationally.

Evidence and analysis

The admission to the Building Construction curriculum is mostly based on the average grade of the candidate (min 3.5) but additional points are granted in case of outstanding achievements. There are no specific admission tests. The number of applications shows a clear competition to enter the

programme (6 applications per seat on average) demonstrating its attractiveness (SER). The application is fair and transparent. The existence of a distance-learning format is to be commended as it allows the students to combine their studies with their work or family situation.

The programme offers many student-centred approaches, starting with the course 'Communication, Teamwork and Critical Thinking' in the first year where the student is immediately encouraged to take responsibility for their learning paths. This is also addressed in the newly created course 'Introduction to Speciality'. Many relevant student-centred activities are also organised with problem- and project-based learning, laboratory and internships. The programme offers 24 ECTS as electives (SER). Combined with the final thesis, this allows the students to choose their specialisation. The initiative to monitor students' workload through the app Toggl is to be commended. Similarly, the online availability of learning resources in the Moodle environment reaches a very high level (95% of courses available). The integration of the students into research projects, as mentioned in the SER, appears to be marginal and could be improved.

The student assessment is the responsibility of each lecturer who determines the criteria. The Panel found limited evidence of good linkage between the learning outcomes and assessment. Moreover, how the level of achievement of the learning outcomes is translated into the grading scale is not elucidated. The participation of external experts, for the internship and final thesis review, is appreciated. Recognition of Prior Learning has been implemented in the programme and is operational.

The practical work and training are central to the BC objectives and is perfectly integrated into the programme (39 ECTS). As a rule, the students must do their internship on construction sites, first as unskilled workers and later, as assistant managers (SER). Opportunities for mobility in Estonia and internationally exist but their use remains limited (less than 10 students per year). This is justified by the little interest shown by the Estonian labour market for international experience, and, from the students' perspective, such stays are hard to combine with their job. Therefore, the programme is developing opportunities for short-term mobility which is an excellent solution but still needs to be better advertised and incentivised.

The students of the BC programme benefit from the TTK services. Additionally, the programme appoints a mentor lecturer to each study group and some students as a tutor. The programme closely monitors the student progression. Since 2016, it is remarkable that the drop-outs have decreased from 116 to 45 (SER). Still, this figure remains high, and the programme is encouraged to pursue efforts to reduce the drop-out rate.

Graduates of the BC programme are highly appreciated by the Estonian labour market particularly for their practical skills, as confirmed during the interview with the employers.

Strengths

- The programme is available in a distance-learning format
- The availability of online learning material is very high.
- The level of employment is very satisfactory, close to 100%.
- Very good level of practical training (39 ECTS) with two internship periods.

Areas of concern and recommendations

- The Panel found limited evidence of good linkage between the learning outcomes and assessment. Moreover, how the level of achievement of the learning outcomes is translated into the grading scale is not elucidated. The programme is recommended better interlinking the learning outcomes and assessment and elucidating how the achievement of learning outcomes is translated into the grading scale.
- Considering the various obstacles for long-term mobility, the programme is recommended to better advertise and incentivise short-term mobility opportunities.

Opportunities for further improvement

- The programme is encouraged to better integrated of the students into research projects.
- The programme is encouraged to pursue the efforts to reduce the drop-out rate.

2.1.3 Development, cooperation and internationalisation of teaching staff

- Teaching is conducted by a sufficient number of professionally competent members of the teaching staff who support the development of the students.
- Teaching staff follows the principles of academic ethics and the codes of conduct in case of non-compliance.
- Members of the teaching staff participate in international mobility programmes which encourage the development of their teaching and RDC activities and the cultural openness of the HEI and the Estonian society.
- The effectiveness of both studies and RDC activities, students' feedback, the effectiveness of supervision, development of teaching and supervision skills, international mobility and entrepreneurial or work experience in the specific field outside the HEI is taken into consideration in evaluating the work of the member of the staff.

Evidence and analysis

According to the SER, as confirmed by the interviews (S+A), there is a huge level of satisfaction of the teaching staff, both quantitatively and qualitatively. The lecturers demonstrate their commitment to professional development with an average of 40 hours per year (SER2, Table 10 p. 42).

Academic ethics are appropriately followed by the academic staff. Similar to the institutional level, the main focus is put on preventing plagiarism. The Panel did not find evidence of any non-compliance case to academic ethics.

The level of internationalisation is fair. There are some international mobility programmes for the academic staff, both outgoing and incoming, mainly with neighbouring countries. This level of internationalisation is satisfactory for the stakeholders, particularly the employers who favour the

development of the national market (E). The academic staff could, however, benefit from intensifying their international collaboration to maintain their expertise at the state-of-the-art level and further contribute to the cultural openness of TTK.

The assessment of the academic staff follows the institutional procedure with an annual meeting with the line management to assess the last year achievement and plan the activities for the next year. Every 5 years, a formal appraisal procedure takes place and takes all activities (RDC, professional development, international and work experience) and data (students' survey) into consideration.

Strengths

- High level of satisfaction of the teaching staff, both quantitatively and qualitatively.
- Good commitment of the lecturers to professional development.

Opportunities for further improvement

- The programme is encouraged to strengthen academic staff skills development through research and development projects and international mobility programmes.

2.2. Mechanical Engineering, Prof HE

In the last cohort (2020), 44 students were admitted to the programme. In the last 5 years, the maximum number of students admitted was 60 (2017) and the minimum was 40 (2019). The self-assessment shows that the total number of students studying at the programme is currently 167 (2020) and the number of dropouts this year was 33, which represents 16.5% of students. The interviews revealed that the majority of dropouts occur during the first year of the programme.

The decline in the number of study places is partly related to demographic trends combined with difficulties in identifying qualified applicants who wish to undertake ME training. The needs for ME graduates are very high and the number of graduates does not fully meet the needs. The number of female students studying ME is very low, but similar to many other European countries.

2.2.1 Planning and management of studies

- The design and development of study programme(s) take into account the expectations of students and other stakeholders, national strategies, legislation and trends in the particular area as well as labour market needs. The level and volume of RDC activities is sufficient and supports the launching of the study programme(s).
- The objectives of study programme(s), modules (including courses) and their learning outcomes are concrete and coherent. The teaching content and methods and assessment criteria and methods support students in achieving their learning outcomes and developing their key competencies. The study programmes support the development of creativity and entrepreneurship and other general competencies.
- The administration of material and financial resources that ensure the design and implementation of the study programme(s) is purposeful, systematic and sustainable. The learning environment, including materials, tools and technology support the students in achieving their learning outcomes.

Evidence and analysis

Several factors have influenced the content and structure of the programme, such as the overall strategic plan, the resources available at TTK and, above all, the needs expressed by employers and alumni.

The training is adapted to the trends identified primarily in industry and its associated needs. Through the Advisory Board and direct contacts, the programme management is responsive to requests for changes in courses and course content. Industry feedback and assessment of the programme is also the most important quality criterion together with student evaluations. Knowledge and experience from international universities are also gathered through cooperation in research projects, among other things. This knowledge and experience are adapted to Estonian conditions. Internationalisation is considered important but is not given the same high priority as it is in many other EU universities. This is considered to be a consequence of the very high demand from the domestic labour market. All

the groups interviewed (M, T, S, E, A) consider that the balance between theory and practice is very good and fully appropriate. The academic staff is, however, recommended to be observant of the balance between theory and practice, so that the balance does not focus too much on today's needs but also provides the knowledge necessary to enable lifelong learning.

All stakeholders consider internationalisation and mobility to be very rewarding and valuable, however, increased internationalisation is considered to be limited in scope by the very strong domestic demand for ME graduates.

Admitting the best-suited students is one of the university's most important tasks. A new system is being trialled whereby specific admission tests are administered. Initial results show that this is contributing to some reduction in the drop-out rate. The programme management states that student drop-out is the main problem in the programme and it has tried to identify the underlying causes and has found, among other things, that admitting the right students to the programme is the best way to solve the problem. In addition, outreach activities, interviews and identification of students at risk are used in order to put in place different forms of support as early as possible.

Although the program management is constantly working on student dropouts, the panel believes that an analysis should be done to find a lower possible limit for student dropouts. It is generally accepted that student dropouts always occur completely regardless of what the university does. The proposed below-border approach should be seen as an objective. By developing this limit, targeted efforts can be made where they will have the best effect. An important factor is to adopt the right students who really want to take the current education. The panel considers that the efforts made for targeted admissions are good and are highly likely to increase examination and reduce student dropouts.

The courses at the study programme have specific learning goals. The results of the training are well in line with the needs that exist and are expected in the industry. This relationship is evident, for example, in interviews of employers. Education has a strong practical character that makes it concrete and valuable for the industry. The project courses within the programme require students to independent need to find knowledge from different sources. This kind of project work stimulates and increases the student's creativity, especially when this is done in smaller groups of students that require collaboration with and help from each other.

Staff are encouraged to engage in research and development as part of their personal development. External research projects often provide additional remuneration to those involved, which should strengthen the incentive to apply for and participate in research projects. Education and RDC take place in an integrated environment, creating the conditions for resource-efficient operations while providing students with good opportunities for research linkages. The overall allocation system has major flaws where the university bears the full cost of student dropouts. Students who start education and complete certain valuable parts of the education and start a job without a degree do not contribute to any financial allocation at all, even though the student contributes to society with knowledge from the university.

Monitoring developments in industry and its needs is important, in some cases the university should also take a proactive role in this development. An important instrument is to continuously work with a trend scouting that also works with longer-term development of the education program and its

course structure. In this trend search, future skills need of teachers can also be assessed, which can form the basis for the planning of new research projects, see also under section 1.11.

The programme has many strengths that the programme managers must safeguard. The main strengths identified are listed below.

Strengths

- Extremely high employability between 90–95%.
- Well-working methods for students' participation and feedback tied to courses, programmes, and implementation programmes.
- Well-established collaborations with industry (tools, machine tools and materials) ensure the technical content of the training.
- Active recruitment of students.
- Good development trend when it comes to the examination, and good activity with targeted admission of students in order to attract the right students as well as good awareness and work to reduce student dropouts from the education.

Areas of concern and recommendations

- The programme academic staff is recommended to be observant of the balance between theory and practice, so that the balance does not focus too much on today's needs but also provides the knowledge necessary to enable lifelong learning.

Opportunities for further improvement

- The programme is encouraged to set clear targets for what can be considered an acceptable level of dropout and to focus on the factors that the programme can directly influence.
- The programme is encouraged to strengthen the proactive recruitment of the right students to the programme to ensure that all needs are met.
- The programme is encouraged to develop a systematic trend analysis method that enables programme management and teachers to better evaluate possible changes in modules with regards to future requirements and expectations.
- The academic staff is encouraged to apply for projects and to participate in research projects, thus strengthening their skills while increasing the scope for new hires and increasing the share of RDC within the teaching community.

2.2.2 Learning, teaching and assessment

- Conditions and organisation of admission ensure fair access to education and motivated student body. Students' choice of specialisation is supported.
- A student-centred approach is used in the studies, aiming at the students to assume responsibility for planning their studies and career and supporting the development of key competencies and achieving the learning outcomes of the study programme.
- Student assessment, including taking accreditation of prior and experiential learning into account, supports the students and corresponds to the learning outcomes. Objective and reliable assessment is ensured.
- The organisation of studies including practical work and training is based on the specificities of students and forms of study and supports the student in achieving the learning outcomes. Opportunities have been established for mobility within Estonia and internationally.
- Support services for students are in place and available for students. Individual development and progress of students are monitored and supported.
- Graduates of the study programme are competitive in terms of their knowledge and social skills both nationally and internationally.

Evidence and analysis

Students, teachers, alumni and employers are consistently very satisfied with the education provided in ME. The concept and use of learning outcomes were, however, not fully confirmed during the interviews and the programme is recommended to make these clear to the students.

Both physical and digital teaching works very well. Both programme management and university management have managed and adapted education well to the circumstances and conditions created by the pandemic. The Panel found limited evidence that the developments plans were properly monitored and their impact assessed. The programme is recommended implementing and evaluating the impact of established plans for development.

The evaluation of the courses and the related feedback also works very well. Teachers apply slightly different ways of implementing feedback from students, some teachers take feedback continuously while others have based their actions on an overall picture after course completion. Alumni and employers see some potential for the development of the ME programme. One wish expressed is to give students a better overall picture of industrial production in terms of the links between technology and economics. It is desirable that students have a better knowledge of the influence of loss factors on the overall cost picture during production as this is important for providing support to improvement work and its prioritisation in a green direction. The programme is encouraged to develop a course in production systems that deals with the links between the technology and economy. This new course could also include sustainable development with regards to material selections and dealing with the potential problem related to critical raw materials (CRM).

What makes the programme very attractive is the balance between theory and practice, which has been cited by all stakeholders. The teaching environment is very good in several respects. Students praised the open and caring culture that exists within TTK. Interviews revealed that training is adapted to the personal circumstances of different students.

TKK has increased the efforts in recruitment to get the right students to the respective education programs, with the aim of reducing student dropouts. An attempt to take admission through tests has begun with positive results. According to interviews with the students at the programme, it was found that there are good opportunities to influence and adapt the studies to their individual interests, including through several different possibilities for alternative courses. The students often have different backgrounds and conditions. Teachers have the opportunity in some cases to personalise and adapt the implementation of their studies in the form of supervision, it emerged during the interviews (S) that this way of working is highly appreciated by the students that enable the study goals to be achieved. The adaptation of the studies is also made by being able to accept and use selected knowledge and courses into the education that have previously been acquired. It has been shown that the students' national competitiveness is very good, verified with data and at interviews of employers. Any safe international competitiveness has been more difficult to assess. However, graduates should be well placed to compete in regions or contexts similar to the Estonian labour market.

Strengths

- Extremely positive students and satisfied alumni and very satisfied employers.
- Good age distribution of teachers which guarantees teaching continuity over time.

Areas of concern and recommendations

- The concept and use of learning outcomes were, however, not fully confirmed during the interviews and the programme is recommended to make these clear to the students.
- The Panel found limited evidence that the development plans were properly monitored, and their impact assessed. The programme is recommended implementing and evaluating the impact of such plans.

Opportunities for further improvement

- The programme is encouraged to develop a course in production systems that deals with the links between the technology and economy. This new course could also include sustainable development regards to material selections and dealing with the potential problem related to critical raw materials (CRM).

2.2.3 Development, cooperation and internationalisation of teaching staff

- Teaching is conducted by a sufficient number of professionally competent members of the teaching staff who support the development of the students.
- Teaching staff follows the principles of academic ethics and the codes of conduct in case of non-compliance.
- Members of the teaching staff participate in international mobility programmes which encourage the development of their teaching and RDC activities and the cultural openness of the HEI and the Estonian society.
- The effectiveness of both studies and RDC activities, students' feedback, the effectiveness of supervision, development of teaching and supervision skills, international mobility and entrepreneurial or work experience in the specific field outside the HEI is taken into consideration in evaluating the work of the member of the staff.

Evidence and analysis

It is clear from the interviews that the ME has competent and committed teachers. The proportion of teachers with doctorates is relatively small. A collaboration on postgraduate teacher training has been established with TalTech, which in the long term will contribute to an increase in the proportion of PhD teachers. The Panel considers that RDCs are very important activities for developing the subject competence of staff. International research projects contribute to internationalisation. Examples have been presented of how international contacts and networks have contributed knowledge and experience that has been adapted to Estonian conditions and subsequently implemented at TTK. Management encourages staff to be active in RDC within the framework of establishing research groups. Students are well aware of the regulations that exist regarding academic ethics. All student reports are reviewed for plagiarism. Rules and regulations are in place regarding, among other things, referencing.

Interviews with employers, among others, revealed that they are very positive about both students and teachers having international experience. Several teacher exchanges with, for example, the Czech Republic were mentioned as valuable. Mobility programme exchanges are also an important factor in teachers' skills development. The panel believes that this form of collaboration also stimulates the creation of international research projects that further contribute to skills development and innovation. The networks that are created also strengthen the possibilities for increased student exchange. Teachers on a mobility programme have a good opportunity to inform about possible student exchanges at their home university. The Panel considers it not out of the question to be able to link exchange students in later grades to the outreach function directed at industry that has been dealt with in section 11.1.

One factor mentioned that played a major role and was considered very positive was the ability of teachers to create a good culture and a good climate of cooperation. It emerged in the interviews with the teachers that it is common to learn from each other, which from experience builds a good learning culture. Horizontal integration into an organisation is important not least for industry. The exchange of knowledge between staff is a key issue in order to bring about development, particularly in the context of generational renewal, in order to maintain continuity of work and its development. The

panel sees it as very important that students meet a well-functioning horizontal culture where teachers exchange knowledge and experiences with each other. The intention is for the students to take these experiences into their professional lives.

Teachers' supervision in project courses and in carrying out degree projects is tailored to the individual needs of each student. One project course mentioned several times was Formula student, which was perceived and assessed as very good because of the balance between theory and practice. Completed degree projects are often strongly characterised by creativity and, in part, entrepreneurship.

Strengths

- Teachers are highly appreciated according to complete course evaluations, which is fully in line with the orally obtained information.
- Good resource efficiency has been achieved by integrating research and training laboratories, which also leads to a strengthened link between research and education.
- Good awareness of issues related to academic ethics. The system is well-balanced, and all written material passes 'Urkund' (www.ouriginal.com).
- The seminar series 'From colleague to colleague', which can be developed and broadened in its content. This is a very important and good activity to create a well-working horizontal integration into the organisation.

Opportunities for further improvement

- The programme is encouraged to intensify the work regarding international exchanges, to increase the number of incoming students.
- The programme is encouraged to strengthen academic staff skills development through research and development projects and international mobility programmes.

2.3.   Transport and Logistics, Prof HE

The programme of Transport and Logistics is a long-running programme at TTK. The programme has been modernised in line with the university policies and includes new experimental learning environments. There is a steady student base with a slight decline in the number of admissions. The programme is given on the Tallinn campus.

2.3.1 Planning and management of studies

- The design and development of study programme(s) take into account the expectations of students and other stakeholders, national strategies, legislation and trends in the particular area as well as labour market needs. The level and volume of RDC activities is sufficient and supports the launching of the study programme(s).
- The objectives of study programme(s), modules (including courses) and their learning outcomes are concrete and coherent. The teaching content and methods and assessment criteria and methods support students in achieving their learning outcomes and developing their key competencies. The study programmes support the development of creativity and entrepreneurship and other general competencies.
- The administration of material and financial resources that ensure the design and implementation of the study programme(s) is purposeful, systematic and sustainable. The learning environment, including materials, tools and technology support the students in achieving their learning outcomes.

Evidence and analysis

The design and development processes of the study programme follow systematic and rigorous procedures, as outlined in the written self-assessment and confirmed in interviews with teachers, programme management and alumni.

There is a particularly strong process in which the transport and logistics sector gets involved at various levels:

- The programme council has representatives from a series of relevant industries and future employers, as well as from the professional standards committee for the sector. At this level, the more strategic questions regarding the needs of the industry are discussed.
- Many courses use Alumni and industry experts as part of the teaching staff, either for specific lectures or even as course coordinators.
- Students do projects out in the industry, and these are evaluated in open communication with the industrial hosting partner.
- Much of the Estonian system is steered by the professional standards for a field, established nationally. The programme is closely linked to the standards.

It is also positive to note the appreciation by the students, teachers, management and the sector of the extracurricular activities, particularly the annual Logistics Forum with around 300 participants, and

run entirely by students. This is exactly what one would expect from a transport and logistics programme of good quality.

There is a collaboration with other Nordic / European universities and stakeholders within Unilog, and a research initiative in digitalisation has recently been established (2020). Given the nature of transport and logistics and the role of Estonia in supply chains, it is applaudable that a clear outlook of the European supply chain sector has been established.

The objectives of the programme are concrete and coherent but are not yet in line with the internationalised outlook as provided in the programme environment. Student exchange went up but needs to grow further to be at a relevant level for the topic. In the interviews with industry, the opportunity to use international offices of multinationals with branches in Estonia was discussed and could be further developed.

There is a large focus on entrepreneurship and practically relevant skills, particularly through the internships embedded in the program. This was particularly appreciated by the alumni (A).

The development areas identified are spot on and provide trust that good management is in place to identify the development areas and work on further implementation.

The teaching environment offers a range of modern lab infrastructures, including ERP software, simulation lab and traffic control labs. Many of these infrastructures are relatively new, and it became apparent from interviewing teachers and students that work is ongoing to deepen the use of these infrastructures in the learning goals, teaching methods and curriculum design. A further development of the labs was mentioned by both teachers and program responsible, but it remained unclear on what that development would entail. The labs are mentioned by all interviewees (but the students) as important for furthering the research at TTK. Action here could be made more explicit and concrete to fully benefit from the ongoing modernisations. The programme manager showed awareness of this development trajectory and had concrete steps on how to enable the teaching team to further their pedagogical skills at the same time.

The budget for development and sustaining the programme and its resources are applied for in a yearly budget process, and if any additional funds are needed, the programme director discusses this with the (vice)rector level. So far, the budget has always been available for reasonable requests.

Strengths

- The involvement of and alignment with the transport and logistics industry is exemplary.
- The programme and its resources and environment have developed very significantly over the past years.

Opportunities for further improvement

- Internationalisation needs to remain high on the agenda, given the international character of the topic, and the geographical location of Estonia. Using industry as support is advisable.
- Further development of all the new lab opportunities could further develop the research culture and programme as well as the curriculum.

2.3.2 Learning, teaching and assessment

- Conditions and organisation of admission ensure fair access to education and motivated student body. Students' choice of specialisation is supported.
- A student-centred approach is used in the studies, aiming at the students to assume responsibility for planning their studies and career and supporting the development of key competencies and achieving the learning outcomes of the study programme.
- Student assessment, including taking accreditation of prior and experiential learning into account, supports the students and corresponds to the learning outcomes. Objective and reliable assessment is ensured.
- The organisation of studies including practical work and training is based on the specificities of students and forms of study and supports the student in achieving the learning outcomes. Opportunities have been established for mobility within Estonia and internationally.
- Support services for students are in place and available for students. Individual development and progress of students are monitored and supported.
- Graduates of the study programme are competitive in terms of their knowledge and social skills both nationally and internationally.

Evidence and analysis

The self-assessment report mentioned all of the points needed for the standard, however, the text lacked specifics on whether this is only words or actual action. The interviews have been used to find concrete examples and test the awareness of all points among students, teachers, management and externals.

From the interviews (M, T, S, E, A), evidence was found that:

- The admissions are handled through the national standard system. Intake interviews have been established with new students since 2019, which help in making sure individual needs are understood and met. Specialisation opportunities are available and appreciated by the students.
- Students are truly at the centre of the teaching approach in all courses, as well as in the program. Teachers encourage students to think about their careers and provide field studies, etc, in collaboration with industry. The enthusiasm of the teachers for the topic and their students was very evident from the interviews, with a clear focus on future employability.
- Assessment is perceived by the students as fair. Some mentioned that earlier experience can be beneficial for certain courses but that this averages out on the programme level.
- There are many, and quality, opportunities for practical work and training in collaboration with industry. International experience is encouraged, though not always easy to realise. This latter point received mixed evidence in the interviews. Some younger interviewees perceived future employers to not appreciate the international experience, whereas the employers were very vocal about the desirability of such, but that students were hard to motivate to travel abroad. Teachers mentioned the personal situations of students that could make longer

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foreign trips difficult to achieve. This is an area in which further development is advisable, as it calls for joint action under the leadership of the programme management.

- Support services for the students are available in the formal sense. More important is the informal support service for which many examples were found both from students and teachers. Students are known, a digital progress tracking system is in place, and there is a genuine interest in the students from the staff.

Graduates from the Transport and Logistics programme are in high demand. So high, that one could ask whether the programme could grow in volume. Examples from international careers were mentioned, but the demand within Estonia is even bigger and national employability high.

Strengths

- The genuine interest in students and the social interactions between students and staff have created a positive atmosphere for learning.

Opportunities for further improvement

- Internationalisation needs to remain high on the agenda, given the international character of the topic, and the geographical location of Estonia. Using industry as support is advisable.
- Developing new means on internationalisation that fit the personal situation of students in the programme under the leadership of the programme management.
- Consider a growth in volume of the programme, with hindsight to the enormous demand for its alumni.

2.3.3 Development, cooperation and internationalisation of teaching staff

- Teaching is conducted by a sufficient number of professionally competent members of the teaching staff who support the development of the students.
- Teaching staff follows the principles of academic ethics and the codes of conduct in case of non-compliance.
- Members of the teaching staff participate in international mobility programmes which encourage the development of their teaching and RDC activities and the cultural openness of the HEI and the Estonian society.
- The effectiveness of both studies and RDC activities, students' feedback, the effectiveness of supervision, development of teaching and supervision skills, international mobility and entrepreneurial or work experience in the specific field outside the HEI is taken into consideration in evaluating the work of the member of the staff.

Evidence and analysis

The self-assessment provided also here a good base layer of evidence, but for a critical assessment, the interviews have been the main source of evidence.

The teaching staff showed a broad interest in the topic of Transport and Logistics. Examples of current courses and professional development of both the staff itself and the learning environment were given. Short-cycled feedback is the key method used for improvement in this program.

Professionally grounded teachers are a strength to the programme. At the same time, this provides a risk of being too local and tied to the current needs of the industry. The experience level of the staff is mixed, which counter-acts this risk. Within the current constellation, the mix is considered to be good, but should prioritise people with an international outlook for the longer future if the same expertise can be found both with an international and a local profile.

Academic ethics are taken seriously, with a particular focus on cheating on exams and assignments. The students knew there was more to it but could not mention other aspects. A clear process in case of non-compliance was mentioned by the programme director.

Multiple members of the teaching staff have participated in international activities, including conferences, the Unilog framework, visits to other universities, etc. There was evidence of increasing numbers of international students within the programme for shorter and longer periods through the ERASMUS programme. There is a clear desire to increase this from the students, and also evidence of such intentions from the teaching staff while taking note of the practical obstacles.

Not all staff is fluent in English, but those who are not are fluent in other relevant languages in the Estonian context like Russian or Finnish.

Given the international character of particularly logistics, it is good to see this level of internationalisation, but further development is certainly encouraged.

Evaluation of staff members happens through a yearly development process that affects the salary development. Periodically, staff can apply for promotions. This follows a more rigorous review process with HR in the loop. This process can also start in special circumstances like for instance a staff member obtaining a PhD. The process can also be used to take care of non-functioning staff members (interview HR).

Particularly relevant for the Transport and Logistics domain is the development of the staff in their knowledge about digitalisation and modern AI/ML-based techniques, advanced simulation, etc. This is both very timely and necessary to make use of the new lab infrastructures in the curriculum. Further development here is expected in synergy with an increasing research portfolio.

Opportunities for further improvement

- To further expand the use of and teaching in Artificial Intelligence and Machine Learning methods for the transport and logistics domain.
- To prioritise international outlooks in staff to the extent possible.

2.4.   Accounting, Prof HE

The structural unit responsible for the implementation of the Bachelor Programme 'Accounting' is the Institute of Service Economy. At this institute, Accounting has been taught since 1957, since 1990 as a professional higher education study programme. As such, TKK's study programme is the only "pure" Accounting programme in Estonia, responding to a need for increasing applied higher education in accounting first-level training as was brought forward in a survey of the labour demand monitoring and forecasting system OSKA. Besides compliance with the Estonian Qualifications Framework level 6, the programme curriculum is based on the senior accountant professional standards level 6.

The nominal duration of the study programme is 3 years (180 ECTS), offered in a full-time format in the Estonian language. Upon completion of the programme, a Bachelor's degree in Social sciences (BA) is awarded.

The key performance indicators for the Accounting Study Programme are the number of enrolled students in the programme, the number of graduates, the number of dropouts as well as the number of students admitted to the programme. Based on these indicators and the feedback from stakeholders, development activities and objectives set in the Institute's action plans are assessed.

In 2020, 195 students were studying in the programme which means a slight decrease over the past five years (222 students in 2016). In 2020, TKK decided to decrease the number of students to be admitted on the account of daytime studies as the competition was lower there and many students transferred to distance learning during studies (SER p.11). The number of graduates has remained rather stable over the last five years, the number of dropouts as well after an increase in the years 2018 and 2019. Student mobility is almost inexistent (1,4% in 2020), mostly because distance learning students (mostly female) find it very difficult to fit studies abroad with work and family.

The main developments over the recent years:

- The last quality assessment took place in 2018 under LVRKK. In 2019, TKK and LVRKK merged.
- Amendment of the curriculum Statute by adding a Business and Administration pan-curriculum group general studies' module (21 ECTS credits) in 2020; furthermore, to decrease fragmentation of subjects, subjects of small scale were merged (now - 3, 6, 9 ECTS).
- Amendment of the professional standard and thus update of the programme course descriptors.

2.4.1 Planning and management of studies

- The design and development of study programme(s) take into account the expectations of students and other stakeholders, national strategies, legislation and trends in the particular area as well as labour market needs. The level and volume of RDC activities is sufficient and supports the launching of the study programme(s).
- The objectives of study programme(s), modules (including courses) and their learning outcomes are concrete and coherent. The teaching content and methods and assessment criteria and methods support students in achieving their learning outcomes and developing their key competencies. The study programmes support the development of creativity and entrepreneurship and other general competencies.
- The administration of material and financial resources that ensure the design and implementation of the study programme(s) is purposeful, systematic and sustainable. The learning environment, including materials, tools and technology support the students in achieving their learning outcomes.

Evidence and analysis

The Accounting Bachelor programme follows the senior accountant professional standard and the Estonian qualification framework level 6 requirements. According to the SER, the Curriculum Council represents employers, representatives of the Estonian Assembly of Accountants, lecturers, and students all of whom participate in the curriculum development by making proposals and giving input from their perspective. As the programme follows the professional standards level 5 and 6, graduates automatically receive the level 5 Certificate upon graduation and are well prepared to take the level 6 Certificate's exam, as alumni confirmed in the interview. Feedback from employers, alumni, and students is considered when making changes to the curriculum, foremost with the aim to ensure that students' development of key competencies is in line with labour market developments and trends in the professional field. National strategies and legislation are equally taken into consideration. As a business education meta-analysis (2020) pointed out a shortage of different skills of graduates such as financial and business analysis skills, a Business and Administration pan-curriculum general studies' module (21 ECTS credits) was included in the programme in 2020 with a view to supporting the development of students' general and entrepreneurial competencies. Furthermore, the volume of accounting module subjects was increased.

Activities such as study visits to companies, involvement of practitioners in the studies or business ideas' competitions for students particularly aim at enhancing students' entrepreneurial thinking. Students confirmed in the interview that entrepreneurship, as well as creativity, are fostered through varied teaching methods and that they are encouraged to bring to class problems from their own work experience.

The level and volume of the staff's RDC activities support the delivery of the study programme, practical research experience is shared, and results of applied research conducted in companies form part of the course contents. (SER). Students, alumni, employers and teachers convincingly stated that practical work/tasks such as case studies or projects with companies are an asset of the programme. A Research methodology course included in the curriculum is designed to foster students' understanding of research types, data analysis, etc. Through their final theses and mini-research projects, students are actively involved in research, development, and creative work (SER, p. 12) According to the SER and the interviews conducted (A, E) graduates successfully perform at several

national competitions, such as the annual National accounting research competition. Many lecturers belong to professional networks, cooperation bodies, etc. and thus, help keep the curriculum up to date with the latest developments in the accounting sector.

The overall study programme objective is to provide students with opportunities to develop general and special competencies that enable them to work as specialists in the field of accounting, participate in lifelong learning and continue their studies at master's level". (SER). This objective is translated into Programme LOs as well as module and course learning outcomes (Appendix 1.4.). The seven PLOs are formulated and structured around understanding, skills, and competencies. The objectives and LOs defined for the main parts of the curriculum – general subjects, core subjects, speciality subjects, elective subjects, practical training, and a graduation thesis – are linked to the PLOs and foster their achievement. The interconnection (links) between the subjects of the accounting curriculum is demonstrated in a chart in Appendix 1.5.

Various teaching methods are applied such as traditional lecture, project-oriented teaching, group work, individual work etc. thus, helping to acquire the necessary competencies both in theory and in practice.

Based on documentation as well as on interviews (S, E, T) the Panel is convinced that the content of the programme is coherent, concrete and up-to-date and that the learning outcomes defined foster the achievement of the programme's objectives. Positive feedback from employers and representatives of professional bodies (E, A) underpin the view of the Panel.

According to the SER, the Service Economy Institute has sufficient material, technical and financial resources to adequately implement the curriculum and offer a modern and unique study environment. Speciality journals are available at the institution's library, as well as access to e-book databases such as ProQuest, EBSCO, etc.

However, the Panel is concerned about equal remuneration of lecturers in the programme (according to staff Accounting lecturers receive lower remuneration than teachers of other subjects) which is obviously due to the HEI remuneration system as was confirmed in the interviews with programme management and teachers. Thus, additional resources are required to harmonise lecturers' remuneration with the general pay level of TTK academic staff (SER, p. 10 and interviews).

Strengths

- A unique programme in the field of accounting that keeps pace with national and international professional requirements based on the comprehensive and purposeful inclusion of various stakeholders in the development, implementation, and execution of the programme.
- Integration of Level 5 Certificate into the curriculum as well as of all subjects for Level 6 Certificate.
- A diligent mix of theoretical and practical / practice-oriented of modules ensure the development and improvement of professional as well as personal skills.

Opportunities for further improvement

- TKK should seek to provide additional resources to harmonise lecturers' remuneration with the general pay level of TTK academic staff.
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2.4.2 Learning, teaching and assessment

- Conditions and organisation of admission ensure fair access to education and motivated student body. Students' choice of specialisation is supported.
- A student-centred approach is used in the studies, aiming at the students to assume responsibility for planning their studies and career and supporting the development of key competencies and achieving the learning outcomes of the study programme.
- Student assessment, including taking accreditation of prior and experiential learning into account, supports the students and corresponds to the learning outcomes. Objective and reliable assessment is ensured.
- The organisation of studies including practical work and training is based on the specificities of students and forms of study and supports the student in achieving the learning outcomes. Opportunities have been established for mobility within Estonia and internationally.
- Support services for students are in place and available for students. Individual development and progress of students are monitored and supported.
- Graduates of the study programme are competitive in terms of their knowledge and social skills both nationally and internationally.

Evidence and analysis

Students are admitted to the Accounting Study programme based on TKK institutional admission regulations and conditions which ensure fair and equal treatment of all candidates. published on the website of the TTK. If needed, individual support and additional information are provided, what students confirmed giving examples of personal experience(s). As stated in the institutional regulations, the main criterion for admission is the average mark on the upper secondary school leaving certificate. According to the SER the threshold mark of 3.4 or 3.5. has been surpassed by successful candidates during the past years (4,29 in 20/21). As of 2021, TTK also organises an Academic test as well as an admission interview to make sure that students are committed to studying and capable of mastering the programme requirements. During the interview with students, the Panel heard overall positive feedback on these new procedures.

Recognition of Prior learning, both learning and work experience, follows the institutional Guidelines laid down in the Conditions and Procedure of Recognition of Prior Learning and Work Experience document published on TKK website. Thus, applicants must demonstrate the correspondence of previous studies and work experience with the learning outcomes of the subject for which they seek recognition. In the case of accounting students, the majority applies for recognition of work experience and accreditation of internships, and gets approval as is stated in the SER and was confirmed by students in the interview.

A student-centred approach in the Accounting programme means considering the students' individual development together with the intended programme learning outcomes and thus choosing an adequate teaching method. As most of the Accounting students are studying and working, teaching methodology considers their working experiences, as well as the studies/training, completed so far. With interactive teaching methods such as discussions, role-plays, case studies but also flipped

classrooms students are encouraged to develop innovative business ideas, and further enhance their personal competencies as well as critical thinking and reasoning. Peer learning is also practised and welcomed by students as a good means of learning from and with each other (S). Students also confirmed in the interview that teachers are highly committed to bridge theory and practice, bring in their professional experiences both national and international and motivate students to bring in their own experience from work (S, T).

Student assessment follows the general principles of assessment laid down in the institutional Study regulations. Lecturers apply both formative and summative assessment; digital solutions and environments are used particularly to assess the individual work of students. Assessment criteria are linked to the specifics of the induvial subjects and subject learning outcomes and introduced to students at the beginning of the subject course. Students reported (in the interviews S) that learning outcomes were explained, assessment criteria were clear both being documented in the internal information system Tahvel. Even though students do not seem to have any problems in understanding Learning outcomes and assessment criteria adequate and clear, the Panel found that the terms assessment criteria and assessment methods are not well distinguished in course descriptions not to say wrongly used, e.g., 'exam test', 'exam', 'active participation in the seminar', 'practical training report' refers to methods and not to criteria; this issue needs clarification in all course descriptions.

The structure of the programme comprises general studies which form the basis for the speciality studies. Electives are designed to enhance and deepen speciality-related knowledge and skills and thus consider students' individual wishes. The Panel appreciates this approach as a good practice to educate true specialists and respond to the needs of the individual learner. Internships are integrative parts of the curriculum and provide supervised field experience for students as well as networking opportunities for the institution. In the interviews (S, A), the Panel learned that students are satisfied with both internship organisation and supervision, and this view was shared by alumni as well.

Students can also opt for an internship abroad under the ERASMUS scheme or in another form of mobility (short-term or studies). As mentioned above, the international mobility rate is very low since distance learning students find it difficult to combine work and family obligations with studies abroad. Furthermore, both students and alumni brought forward that they work in an international accounting firm or in a company with strong international ties, and thus are well trained in using professional English and enhancing their international and intercultural skills.

To provide support to students during their studies students' progress is monitored and support is given by lecturers, the Curriculum Coordinator, and the Academic Affairs Specialist, who find out the obstacles to completing the subject, offer study guidance and/or compose a schedule to complete the subject. At the end of each semester, the Quality Management Office makes a summary of progress and advises students based on need (SER, staff interview).

Accounting programme graduates are well received by the labour market as can be seen from the alumni survey and the high employment rate. In the interviews employers and representatives of professional bodies appreciatively mentioned the quality of the Accounting programme and its graduates, as well as the need for more well qualified graduates (and thus a higher intake of students). Satisfaction of graduates with the education received is also demonstrated by a further commitment to TKK, either as internship supervisors, members of the Curriculum Council or even as lecturers at TKK. Alumni feedback in the interviews underlined the survey results; the development of professional

competencies and personal and social skills such as self-confidence, courage to create their own business and the readiness to support others was appreciatively mentioned as well (A, E).

Strengths

- The structure of the study programme is well designed, complies with the professional standards and fosters state-of-the art professional knowledge and skills enhancement. Accounting programme graduates are well received by the labour market.

Opportunities for further improvement

- The programme is encouraged to better distinguish the terms 'assessment criteria' and 'assessment methods' in module descriptors.
- TKK should reflect on / consider an increase of study places and thus student intake as representatives from the labour market convincingly mentioned the urgent need of well-educated accounting specialists.

2.4.3 Development, cooperation and internationalisation of teaching staff

- Teaching is conducted by a sufficient number of professionally competent members of the teaching staff who support the development of the students.
- Teaching staff follows the principles of academic ethics and the codes of conduct in case of non-compliance.
- Members of the teaching staff participate in international mobility programmes which encourage the development of their teaching and RDC activities and the cultural openness of the HEI and the Estonian society.
- The effectiveness of both studies and RDC activities, students' feedback, the effectiveness of supervision, development of teaching and supervision skills, international mobility and entrepreneurial or work experience in the specific field outside the HEI is taken into consideration in evaluating the work of the member of the staff.

Evidence and analysis

Teaching is delivered by professionally competent staff as demonstrated by the respective CVs and confirmed during interviews. There are 26 permanent lecturers, three of them holding a doctoral degree, 21 of them having a master's degree. Many lecturers belong to professional networks, cooperation bodies, etc. and thus, bring in-field experience and help keep the curriculum up to date with the latest developments in the accounting sector. There are also guest lecturers who are invited to deliver different courses. T

The Panel learned that teaching staff update their competencies by doing in-company training/apprenticeship, participating in professional training, sharing experiences, etc. Teaching staff also participate in conferences, projects and the work of professional networks and councils and in delivering training to secondary schools. (SER, p.15). The age structure of the teaching staff is sustainable as the average age is 53.3 years. The students were satisfied with the teaching and learning experiences provided by both internal and external teaching staff as was confirmed in the interviews.

The teaching staff has a clear understanding of "contemporary teaching" as set out in the Strategic Plan; they also share the common understanding of quality as striving to satisfy learners' needs and expectations. Staff is involved in curriculum design as well as further development of the programme.

Teaching staff follow the principles of academic ethics and codes of conduct and inform students about the requirements of the codes of conduct and the consequences of non-compliance. The Panel also learned that the antiplagiarism system Urkund is used for plagiarism checks for independent student work. According to the SER and confirmed by interviewees no direct cases of plagiarism have been identified during recent years which shows that there is a high-level awareness of academic ethics rooted in the institutional culture. TTK pays regular attention to academic ethics as ethical principles are discussed at the management meeting. Students are familiarised with this topic already in the first year.

Members of the teaching staff participate in international mobility as is stated in the SER: during the last years on average 12 lecturers participated in international mobility per year assuming teaching missions at e.g., Portuguese, Bulgarian, and Lithuanian HEIs. According to the information provided, outgoing and incoming staff mobility is well balanced with on average 11 visiting lecturers e.g., from the UK, Bulgaria, Estonia, etc., delivering lectures as TKK. The Panel acknowledges that staff mobility considerably contributes to fostering the institution's aspiration of international reputation and competitiveness but also staff development in terms of enhancing teaching skills and research activities.

The Panel found that diverse activities and aspects are taken into consideration when evaluating staff performance and work. During the performance assessment, the achievement of goals set with regards to teaching including mobility and supervision work, entrepreneurial experience and training in the relevant professional field, research, participation in projects and other activities is discussed and jointly evaluated.

Strengths

- The high commitment of teaching staff to further develop their teaching competence and design and apply innovative teaching methods.
- Active exchange of teaching experiences based on the common understanding of quality as striving to satisfy learners' needs and expectations.