

Decision Regarding Assessment of the Physical Sciences Study Programme Group at the Level of Doctoral Studies Tallinn University of Technology

20/06/2018

The Quality Assessment Council for Higher Education at the Estonian Quality Agency for Higher and Vocational Education decided to approve the report by the Assessment Committee and to conduct the next quality assessment of the Physical Sciences study programme group at the level of doctoral studies at Tallinn University of Technology in seven years

On the basis of subsection 10 (4) of the Universities Act and point 40.1 of the 'Quality Assessment of Study Programme Groups at the Level of Doctoral Studies', authorised in points 3.7.3 and 3.7.1 of the Statutes of the Estonian Quality Agency for Higher and Vocational Education (hereinafter referred to as 'EKKA'), the EKKA Quality Assessment Council for Higher Education (hereinafter referred to as 'the Council') affirms the following:

1. On 30.03.2017 Tallinn University of Technology and EKKA agreed upon a time frame to conduct a quality assessment of the study programme group.
2. The Director of EKKA, by her order on 22.02.2018, approved the following composition of the Quality Assessment Committee for the Physical Sciences study programme group at the level of doctoral studies at the University of Tartu, Tallinn University of Technology and Tallinn University (hereinafter referred to as 'the Committee'):

Robert William Munn	Chairman of the Committee, Consultant, Finchwood Academic, UK
Christian Enss	Professor, Heidelberg University (Germany)
Anna Geppert	Professor, Sorbonne University (France)
Lars Erik Holmer	Professor, Uppsala University (Sweden)
Juha Karhu	Professor, University of Helsinki (Finland)
Jürg Luterbacher	Professor, Justus Liebig University of Giessen (Germany)

Risto Nieminen	Professor, Aalto University (Finland)
Jakob Johansson	Doctoral student, Lund University (Sweden)

3. Tallinn University of Technology submitted the following doctoral programmes for evaluation under the Physical Sciences study programme group:

Earth Sciences

Engineering Physics

4. Tallinn University of Technology submitted a self-evaluation report to the EKKA Bureau on 24.01.2018, and the assessment coordinator forwarded it to the Committee on 9.02.2018.
5. An assessment visit to Tallinn University of Technology took place on 26.04.2018.
6. The Committee sent its draft assessment report to the EKKA Bureau on 23.05.2018, and EKKA forwarded it to Tallinn University of Technology for its comments on 25.05.2018 and the University delivered its response on 6.06.2018.
7. The Committee submitted its final assessment report to the EKKA Bureau on 6.06.2018. The assessment report is an integral part of the decision. The report is available on the EKKA website.
8. The Secretary of the Council forwarded the Committee's final assessment report along with the University's self-evaluation report to the Council members on 6.06.2018.
9. The Council with nine members present discussed these received documents in its session on 20.06.2018 and decided to highlight the following strengths, areas for improvement, and recommendations in the assessment report regarding the Physical Sciences study programme group at the level of doctoral studies at Tallinn University of Technology.

The Committee highlighted for the Physical Sciences study programme groups at the University of Tartu, Tallinn University of Technology and Tallinn University the following common areas for improvement and recommendations:

- 1) The fact that the Estonian society and labour market do not highly value a doctoral degree is a challenge for the universities. Holding a doctoral degree has little influence on employment outside the academy. In some cases, it might even prove to be an obstacle. The universities should develop a joint plan for promoting the value of a doctoral degree outside the academic domain.
- 2) Today, the labs are well equipped, but there are no resources for sustaining or improving their level of quality since in a few years the European Union funds will no longer be available in the extent they are now. Universities should join forces to design mid-term and long-term measures for renewing the infrastructure.
- 3) An income equal to the average salary in Estonia shall be ensured for all doctoral students. It should mainly be done by increasing the state scholarship, but if this is not achievable, universities should supply it.

- 4) In the case of more ambitious projects, the period of doctoral studies tends to be extended. Besides having a principal supervisor, all doctoral students should have a co-supervisor in order to ensure that the required number of publications needed for defending the doctoral thesis is prepared during the four years foreseen for the studies.
- 5) Many doctoral students have a feeling that they are on their own. The universities should organise more activities that would enable doctoral students from various research teams to get better acquainted. Seminars with guest lecturers bringing students from different research teams together should be organised regularly.
- 6) The biggest obstacle in recruiting and maintaining international doctoral students is the lack of sufficient information available in English. The University's website has to provide better information in English, and the number of courses in English has to be higher to promote the admission of international doctoral applicants.
- 7) The volume of industrial practice is insufficient, and the same applies to the uptake of industrial doctorate programme opportunities. However, it would add value to a PhD degree outside academia and allow the universities to generate additional income from cooperation projects with enterprises. Universities should set up systematic measures that would give doctoral students an incentive to conduct a part of the doctoral thesis outside the University.
- 8) Teaching sometimes puts a significant burden to the doctoral students and being a supervisor to bachelor's or master's students halts their research work for weeks. However, doctoral studies should primarily focus on research and ensuring the continuity of research is a task of the head of the study programme.
- 9) According to an agreement between universities, three published articles is a precondition for defending one's doctoral thesis, which is more of a quantitative and not so much qualitative requirement. In their self-evaluation, the universities highlighted that the requirement of three articles is a problem for the more demanding projects that include extensive fieldwork. However, during the assessment visit, almost no one referred to it as an issue. The requirements set for publications should be more flexible and focused on their quality. Also, for longer projects, the payment of doctoral allowance should continue beyond the standard period.
- 10) For each doctoral thesis defended within the standard period of study, the supervisors receive a considerable one-time additional fee. The Assessment Committee finds that this practice should be reviewed since productively supervising a doctoral student should be one of the contractual obligations of supervisors.
- 11) All three universities have a doctoral programme in physics. At the same time, the teaching staff of these study programmes are relatively passive in developing the study programmes, seeing additional funding as the primary development need. Continuance of the doctoral programme in physics is of strategic importance, but the universities and relevant academic units need to outline a long-term vision for the development of doctoral studies and recruit new active teaching staff to implement it.

Strengths, areas for improvement and recommendations for the Physical Sciences group of programmes at Tallinn University of Technology

ENGINEERING PHYSICS

Strengths

- 1) The study programme is science-based, offers profound knowledge in various fields and systematic development of general and transferable skills.
- 2) The infrastructure is of sound level, multifunctional and well appreciated by the doctoral students.
- 3) The small numbers of doctoral students allow for frequent communication with academic staff.
- 4) The tenure system plays well into taking strategic decisions about renewing the composition of academic staff.
- 5) Younger teaching staff can develop their supervisory skills through co-supervising and mentoring.

Areas for improvement and recommendations

- 1) A significant problem is the low and further decreasing number of doctoral students. There are four research focuses under the study programme while only 5 out of 26 doctoral students worked in the University in 2017. The situation regarding the sustainability of research teams is critical and raises fundamental questions about the objectives of the doctoral studies. The number of doctoral students shall be increased to ensure the sustainability of research and doctoral studies.
- 2) Some research teams are of a subcritical size and fragmented, thus strategic decisions shall be taken regarding the direction of research shortly.
- 3) All doctoral students shall be granted the opportunity to engage in teaching activities.
- 4) Feedback from doctoral students, alumni and employers shall be gathered systematically, like the University points out in their self-evaluation report.
- 5) Collaboration with enterprises shall be promoted more strongly (also allocating the necessary resources), including for long-term practical training.
- 6) International research grants should be sought more vigorously, including from the European Research Council.
- 7) Favourable conditions for creating and protecting intellectual property shall be created; doctoral students shall receive support in obtaining patents.
- 8) Mobility of doctoral students shall be improved.
- 9) An alumni network shall be established and career counselling mechanisms introduced.
- 10) According to doctoral students, the supervisors are very often busy with numerous other tasks. Doctoral students shall have a sufficient number of regular meetings with their supervisors. Supervising should be included in the overall workload of the teaching staff and researchers.
- 11) Doctoral students should have more opportunities to choose their supervisor and topic themselves. Under the current system, the supervisor's publication results and other indicators tend to have excessive weight.
- 12) More international cooperation is necessary to expand the circle of research topics.
- 13) Teaching skills of teaching staff shall be developed more systematically.
- 14) The annual drop-out rate of 10 % is relatively high, and it is necessary to look into the reasons behind it.

EARTH SCIENCES

Strengths

- 1) The recently established tenure system is auspicious, which is demonstrated by two filled positions in meteorology and mining engineering.

- 2) Supervisors are experienced researchers and successful in obtaining competition-based funding. Most of the doctoral students have the opportunity to communicate with their supervisor daily in an open and friendly setting.
- 3) Admission is well regulated and efficient, all leading professors and researchers can suggest doctoral projects and supervise them with excellent results.
- 4) An income equal to the average salary in Estonia is ensured for all doctoral students.
- 5) Research infrastructure is excellent due to the projects funded by the European Union. Doctoral students have access to such unique and essential geology, meteorology and marine science infrastructures as the Särghaua Earth Science Centre and a research vessel.
- 6) Graduates have excellent employment opportunities outside academia.
- 7) A more thorough admissions procedure has reduced drop-out rates.

Areas for improvement and recommendations

- 1) The share of international doctoral students is significantly lower than in other similar study programmes in Europe. Recruiting activities to attract international doctoral students shall be diversified by advertising at conferences and using the opportunities on the internet.
 - 2) Cooperation between the alumni, employers, Study Programme Council and doctoral students shall be improved; opportunities for practical training, seminars and PhD projects outside the University shall be created in collaboration with employers.
 - 3) The position of employers and alumni shall be taken into consideration, according to which more opportunities shall be created in the study programme for acquiring transferable competencies in areas such as business administration, project management, communication, law, teamwork and IT. More subjects should be provided in the field of applied geology.
 - 4) More services should be provided to other public sector institutions (including the recently established Geological Survey of Estonia) and private companies to generate funds and cover the running costs of laboratories.
 - 5) Courses on teaching for the teaching staff shall be better targeted and take place regularly.
 - 6) Career counselling of doctoral students shall be improved.
 - 7) The procedures for the uptake of tenure shall be clear and transparent for all academic staff.
 - 8) The share of teaching load and principles of remuneration of doctoral students shall be transparent.
 - 9) New ways of formal and non-formal communication between doctoral students shall be found.
- 10.** Point 41 of the 'Quality Assessment of Study Programme Groups at the Level of Doctoral Studies' establishes that the Quality Assessment Council shall approve an assessment report within three months after receipt of the report. The Council shall weigh the strengths, areas for improvement, and recommendations outlined in the assessment report, and decide whether to conduct the next quality assessment of that study programme group in seven, five or three years.
- 11.** The Council weighed the strengths, areas for improvement, and recommendations presented in point 9 of this document and found that the study programme, the teaching conducted under these programmes, and development activities regarding teaching and learning conform to the requirements, and

DECIDED

to approve the assessment report and to conduct the next quality assessment of the Physical Sciences study programme group at the level of doctoral studies at Tallinn University of Technology in seven years.

The decision was adopted by nine votes in favour and 0 against.

- 12.** The Council proposes that Tallinn University of Technology submit an action plan to EKKA concerning the areas for improvement and recommendations pointed out in the report no later than 20.06.2019.
- 13.** A person who finds that his or her rights have been violated or his or her freedoms restricted by this decision may file a challenge with the EKKA Quality Assessment Council within 30 days after the person filing the challenge became or should have become aware of the contested finding.

The Council shall forward the challenge to its Appeals Committee who shall provide an unbiased opinion in writing regarding the validity of the challenge to the Council, within five days after receipt of the challenge. The Council shall resolve the challenge within ten days of its receipt, taking into account the reasoned opinion of the Appeals Committee. If the challenge needs to be investigated further, the deadline for its review by the Council may be extended by a maximum of thirty days.

A legal challenge to this decision is possible within 30 days after its delivery, by filing an action with the Tallinn courthouse of the Tallinn Administrative Court under the procedure provided for in the Code of Administrative Court Procedure.

Eve Eisenschmidt
Chair of the Council

Hillar Bauman
Secretary of the Council