Decision Regarding Assessment of the Mathematics and Statistics Study Programme Group at the Level of Doctoral Studies
University of Tartu

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 Mathematics and Statistics study programme group at the level of doctoral studies at the University of Tartu 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 19.04.2017, the University of Tartu 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 12.02.2018, approved the following composition of the quality assessment committee for the Computer Science and Information Technology and Mathematics and Statistics study programme group at the level of doctoral studies at the Tallinn University of Technology, Tallinn University and University of Tartu (hereinafter referred to as 'the Committee'):

Ernst W. Mayr (chair)	Professor Emeritus, Department of Informatics, TUM, Munich (Germany)
Juha Kalevi Kinnunen	Professor, Head of the Department, Mathematics, Aalto University (Finland)
Dick H.J. Epema	Professor of Computer Science, Delft University of Technology (Holland)
Sasu Tarkoma	Professor, Head of Department, Department of Computer Science, University of Helsinki (Finland)

Tõnu Pekk	*Tuleva Tulundusühistu*, member of the board, head of the Task Force on Funding Research and Higher Education 2016–2017 (Estonia)
Josip Maric	Doctoral student, University Of Montpellier (France)

3. The University of Tartu submitted the following doctoral programmes for evaluation under the Mathematics and Statistics study programme group:

Mathematics
Mathematical Statistics

4. The University of Tartu submitted a self-evaluation report to the EKKA Bureau on 22.12.2017, and the assessment coordinator forwarded it to the Committee on 18.01.2018.

5. An assessment visit was made to the University of Tartu on 13.03.2018.

6. The Committee sent its draft assessment report to the EKKA Bureau on 29.04.2018, and EKKA forwarded it to the University of Tartu for its comments on 7.05.2018 and the University delivered its response on 17.05.2018.

7. The Committee submitted its final assessment report to the EKKA Bureau on 25.05.2018. 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 9 members present discussed these received documents in its session on 20.06.2018 and, based on the assessment report, decided to point out the following strengths, areas for improvement, and recommendations regarding the Mathematics and Statistics study programme group at the level of doctoral studies at the University of Tartu.

The Committee pointed out the following observations and recommendations for the Computer Science and Information Technology study programme groups at the Tallinn University of Technology, Tallinn University and University of Tartu, and for the Mathematics and Statistics study programme group at the University of Tartu:

1) The Committee is under the impression that a doctoral degree in IT is not much valued in Estonia, and thus, it is challenging to enrol the best talents to those study programmes. Universities should make more joint efforts to promote the benefits arising from doctoral programmes to the general public, and give concrete examples.
2) It is advisable that universities focus even more on internationalisation by increasing the two-directional mobility of students and teaching staff and benchmarking their performance targets against foreign universities.
3) Although skills-based, as well as theoretical subjects, deserve their place in the study programme, it is advisable to reduce the proportion of subject courses somewhat and redesign teaching and learning to meet individual needs better. Year-long subject courses will only be justified if otherwise promising doctoral students have no prior knowledge necessary to start research work.

4) It is advisable to bear in mind the industry's rapid development, advancing the connections with enterprises and putting more focus on applied research.
5) Advanced subject courses should be offered in such subjects as machine learning and data analysis to ensure scientific developments in IT and data statistics.
6) Keeping in mind that the Universities have adequate supervising capacity, it is advisable to increase the number of doctoral students.
7) In order to promote industrial doctorate programmes, it is also advisable to initiate the creation of a tax exemption model for employers who recruit doctoral students.

Strengths, areas for improvement and recommendations regarding the Mathematics and Mathematical Statistics study programme

Strengths

1) Nationally, these study programmes have a vital role, since no similar programmes are offered in other Universities in Estonia. The reputation and quality of these study programmes are excellent; the lecturers are distinguished scientists.
2) Graduates have been employed in their professional field. Majority of the graduates (80%) work in the academy, while the banking and statistics sector employs the other 20%.
3) A strength of the study programmes is the presence of qualified supervisors, which attracts doctoral students with a real passion for science to enrol on the programme.
4) Doctoral students and lecturers are satisfied with the teaching, learning and supervising. There is close and supportive cooperation between supervisors and doctoral students.
5) The workload of supervising and teaching is distributed well.
6) Annual evaluation of doctoral students is transparent.
7) The study programmes have a stimulating atmosphere which encourages international visibility of the doctoral students and cooperation (conferences, seminars, and other).

Areas for improvement and recommendations

1) The Committee suggests merging the two study programmes. For future outlook, it is advisable to tighten the cooperation between mathematicians and statisticians.
2) The doctoral programmes would benefit from having more international benchmarking, collaboration, mobility, learning materials and teaching staff. The study programme group (especially the Mathematical Statistics study programme) should, more than before, consider the needs of enterprises and society as a whole.
3) It is advisable to promote international mobility of students; during the evaluation period, just one doctoral student had been involved in international mobility programme that exceeded 30 days.
4) It is advisable to draft a more comprehensive strategy for finding new professors, in order to ensure enough new teaching staff in the future and recruit top talents.
5) Duration of study is relevantly long in international comparison. According to the doctoral students, it is a challenge for them to publish three scientific papers during the nominal period of study, especially keeping in mind long publication cycles in journals. More flexible forms of doctoral theses could be applied, however, not at the expense of their quality. For example, a

doctoral thesis could be written as a monograph with one published paper in an international journal and additional research results that correspond to two scientific papers.

6) Most of the doctoral students have to take a job to support their studies, often in fields not related to their research. 36 % of the doctoral students discontinue their studies. It is yet again recommended that the University would increase the financial benefits of doctoral students, allowing them to devote to their studies and research full time. Doctoral students should be better informed about current financing opportunities.
7) Due to low numbers of doctoral students, several compulsory subject courses are available in every other or third year, complicating the planning of studies. Updated information about subject courses should be available at all times.
8) The teaching staff should be provided with more opportunities to develop their teaching and supervising skills.
9) Doctoral students should be offered more guidance and information about career planning.
10) Besides theoretical research, applied studies should be developed to encourage contacts between doctoral students and stakeholders outside the University.

10. Point 40 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 Mathematics and Statistics study programme group at the level of doctoral studies at the University of Tartu in seven years.

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

12. The Council proposes that the University of Tartu will 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