ESTONIAN QUALITY AGENCY FOR HIGHER AND VOCATIONAL EDUCATION

Assessment Report

Transport Services

Tallinn University of Technology

2019

Content

Introduction

Quality assessment of a study programme group involves the assessment of the conformity of study programmes and the studies and development activities with the purpose of providing recommendations to improve the quality of studies.

The goal of quality assessment of a study programme group is supporting the internal evaluation and self-development of the institution of higher education. Quality assessment of study programme groups is not followed by sanctions: expert assessments should be considered recommendations.

Quality assessment of a study programme group takes place at least once every 7 years based on the regulation approved by EKKA Quality Assessment Council for Higher Education *Quality Assessment of Study Programme Groups in the First and Second Cycles of Higher Education*.

The aim of the assessment team was the evaluation of the Study Programmes belonging to the Study Programme Group (SPG) of Transport Services in Tallinn University of Technology.

The team was asked to assess the conformity of the study programmes belonging to the study programme group and the instruction provided on the basis thereof to legislation and to national and international standards and/or recommendations, including the assessment of the level of the corresponding theoretical and practical instruction, the research and pedagogical qualification of the teaching staff and research staff, and the sufficiency of resources for the provision of instruction.

The following persons formed the assessment team:

Bjørn Egil Asbjørnslett (Chairman)	Professor, Head of the Marine systems research group, Norwegian University of Science and Technology (Norway)
Bart Wiegmans	Senior Researcher, Faculty of Civil Engineering and Geosciences, Section of Transport and Planning, TU Delft (The Netherlands)
Egil Pedersen	Professor of Technology, UiT The Arctic University of Norway (Norway)
Janne Lahtinen	Senior lecturer of maritime studies, Dynamic Positioning Instructor, Satakunta University of Applied Sciences (Finland)
Janek Saareoks	CEO, AS Schenker (Estonia)
Anett Nurm	Student, Estonian University of Life Sciences (Estonia)

The assessment process was coordinated by Liia Lauri (EKKA).

After the preparation phase, the work of the assessment team in Estonia started on Monday, 21 October 2019, with an introduction to the Higher Education System as well as the assessment procedures by EKKA, the Estonian quality agency for

higher and vocational education. The members of the team agreed the overall questions and areas to discuss with each interview group. The distribution of tasks between the members of the assessment team was organised and the detailed schedule of the site visit agreed.

During the following days, meetings were held with the representatives of the Tallinn University of Technology (22 – 23 October).

On Thursday, 24 October, the team held an all-day meeting, during which both the structure of the final report was agreed and findings of team meetings were compiled in a first draft of the assessment report. This work was executed in a cooperative way and the members of the team intensively discussed their individual views on the relevant topics.

In the following sections, the assessment team summarise their general findings, conclusions and recommendations that are relevant across the whole SPG. In so doing, the team provides an external and objective perspective on the programmes and the contexts within which they are delivered. Ultimately, the intention is to provide constructive comment and critique which may form the basis upon which improvements in the quality of the programmes may be achieved. In formulating its recommendations, however, the assessment team has not evaluated the financial feasibility associated with their implementation.

1. Assessment report of Transport Services Study SPG at the Tallinn University of Technology

1.1. Introduction

History of TalTech dates back to 17 September 1918 when the Estonian Engineering Society opened an engineering school called Special Engineering. Qualification of the university was granted to Tallinn University of Technology in 1936. The status of a university in public law was granted on 12 January 1995 by the Universities Act. On 4 June 2014, the Estonian parliament adopted the Tallinn University of Technology Act that defines the role of TalTech in the Estonian education and research landscape as well as the institutional management structure.

TalTech is a leading engineering and technology education and research centre in Estonia providing programmes in engineering and technology, natural, exact and social sciences. There were 10852 students studying in TalTech as of November 2018.

Estonian Maritime Academy is one of the schools of TalTech and it is the only educational institution in Estonia that offers professional higher education and Master's level education in the maritime field. Since the 1st of January 2017, the Maritime Academy is an academic structural unit of the level of a school of TalTech.

Four study programmes under current assessment belonging to the study programme group of Transport Services are managed by the Estonian Maritime Academy of TalTech. In addition, there is a Master programme in Logistics belonging to the Transport Services study programme group that is managed by the School of Engineering, Department of Mechanical and Industrial Engineering.

Table 1. Overview of Study Program Group

Study program group	Transport Services
Study programs - in alphabetical order	Logistics (EALM02) (MA) Maritime Studies (VAAM15/18) (MA) Navigation (VDLR14/17) (Prof HE) Port and Shipping Management (VDSR14/17) (Prof HE) Waterway Safety Management (VDVR14/17) (Prof HE)

Table 2. Data on the students enrolled in the curricula

	18/19	**17/18**	**16/17**	**15/16**	**14/15**
Logistics	111	126	120	122	117
Maritime Studies	47	45	37	42	46
Navigation	193	215	220	220	217
Port and Shipping Management	150	158	153	149	146
Waterways Safety Management	44	33	27	27	40

No of admission and students: as of 10.11

Table 3. Admitted students

	18/19	**17/18**	**16/17**	**15/16**	**14/15**
Logistics	32	38	45	42	44
Maritime Studies	18	16	24	16	17
Navigation	40	54	57	67	55
Port and Shipping Management	37	48	46	46	41
Waterways Safety Management	19	13	12	7	17

No of admission and students: as of 10.11

Table 4. Graduating students

	18/19	**17/18**	**16/17**	**15/16**	**14/15**
Logistics	30*	32	22	36	34
Maritime Studies	9*	12	8	9	8
Navigation	30*	25	30	26	25
Port and Shipping Management	24*	34	21	14	17
Waterways Safety Management	3*	3	2	6	8

No of drop-outs and graduates: as of 01.10.-30.09

* 2018/19 number of graduates as of 26.06.2019

Table 5. International mobility

	18/19	17/18	16/17
Logistics	0	1	1
Maritime Studies	0	0	1
Navigation	12	15	10
Port and Shipping Management	2	2	1
Waterways Safety Management	1	0	0

Table 6. Dropout of students

	17/18	16/17	15/16	14/15
Logistics	20	11	15	11
Maritime Studies	11	6	22	16
Navigation	43	44	47	51
Port and Shipping Management	21	32	36	38
Waterways Safety Management	7	15	7	17

No of drop-outs and graduates: as of 01.10.-30.09

1.2. General findings and recommendations at the study programme group level

General findings

Study program groups and individual study programs are contemporary structures to fill educational needs for candidates with specific competence in a society. A society's needs is both reflected by international trends that directly or indirectly affects the requirements for a study, as well as meet feedback from relevant stakeholders about how well a study meets and develops for the needs of the group of stakeholders. Based upon the self-evaluation report, additional written material and the site-visit, it is our understanding the Transportation Services Study Program Group in TalTech listens to both needs in their development effort. In addition, they have in the last period had to meet the requirements of the new subject scope structure within TalTech. It is our impression that all study programs in the group have managed the adaptation to the new study structure and module size/scope in a good way. It is also a change that has been positively acknowledged by the students across the study programs.

We see that the SPG has achieved the principal fundamental changes that was stated for the latest revision of the SPG. The base part of the programs have been given due attention, enabling a set of base subjects that will support the further learning process in the programs. The base subjects are further supported by compulsory subjects that develop the perspective and critical scientific thinking, as well as improved communication through language training. The student's freedom of choice is also improved, where more elective subjects can be found and where also more independent work instead of contact classes should have a long-term positive impact on the student's individual specialisation. Finally, we have gotten confirmation that the change to the new subject volume system have been achieved in a positive way.

For the study programs where practical studies are an integrated part, we have experienced a good blend between the theoretical and practical part, where the theoretical part gives a good basis for the practical training. We have also seen good examples of development of theoretical models that are developed into digital tools to be applied in the practical context. This is example of good state-of-art practice.

We have learned that establishing good and relevant practice and internship still can be challenging, but have also seen examples of good solutions. We acknowledge the challenge of developing internships, but see that - based upon the SPGs in general very good relation with its employer side stakeholders, the SPG as a group should develop a common action plan for formal establishment of internships and relevant company based thesis problems.

Internationalisation can be challenging due to language barriers, and we acknowledge the special circumstances in seeking to achieve good practice in using the Estonian language in professional academic practice in parallel with seeking development towards international practices of professional knowledge development and international academic sources of knowledge - including e-learning tools and sources. However, we do see that this issue is given due attention around among the SPG and SP management, as well as by the faculty, which we see as a strong point for further development. Not least, resource wise, with limited resources, using international digital learning material in the English language will in itself over time contribute to the internationalisation of the SPG. A good example of internationalisation in practice can be found in the SP that aim for an international accreditation of the study program.

With respect to research process development within the SPG, we have seen good research practice being developed between the Estonian Maritime Academy based SP and faculty at other TalTech units. Given the resources of the SPG, the student profiles and relations with society and industry, we believe that the SPG should be a candidate for good research collaboration both with other TalTech units, as well as with external stakeholders. We suggest raising this within the group and learning from good practice established within the SPG. In general, the faculty in the SPG conduct research that bring value to the study programs. In some cases, research results are used in the teaching and learning process, in other cases research goes alongside the studies so that students can experience research as part of their study context, and students also actively participate in research studies. In addition, for all cases the competence of scientific research processes benefit the scientific development of the student group. The

academic staff for all SPs on average has a good percentage of active researchers, securing research based education. The same accounts for practical experience in practically oriented subjects. Both the status of the pedagogical qualifications, awareness of the importance of good pedagogical performance, and availability of pedagogical training is in general seen as good in the SPG.

We have been assured about the positive functionality of the Study Information System (SIS) in providing the students with practical means to give feedback about courses and programs. However, the students also commented upon the potential for bias in the SIS feedback process - either overly positive or overly negative. We understand that this is acknowledged in how the feedback results are being used for instance in teacher evaluation processes. However, this should also be communicated to the students so that they understand this, and hence the non-effective feedback in too positive or negative feedback.

Student drop-outs and the reasons for quitting their studies is well acknowledged within the SPG, and we have seen that there are much good work taking place to counteract this. The process to get accepted into the study programs make more use of active dialogue through interviews to both assess the candidate's understanding of the true nature of the study, as well as let the faculty get a good impression of the candidate's true interest in and qualification for the study. Different measures both pre-study and in the start-up subjects of the study has been taken to improve the candidates' ability to deal with sciences, but as this is an important topic for the profile of the studies we see that more formal pre-study scientific training might be required. The Estonian language can be a challenge for candidates with other mother tongues, and this is an aspect of importance for the internationalisation aspects of the SPG. We see that different approaches are taken to balance the Estonian language with accessibility to the studies by non-Estonian students, but see that this is still an issue with more sides than just enabling access to the studies for non-Estonian students. The role and value of domestic language is a matter of its own even in academic programs. A good level of academic challenge can be found in the SPG, and we have seen good examples of how this might be leveraged even as part of practically oriented programs. Both research parallels and ability for more electives should contribute to better individualization of academic level of a student’s own study plan. However, this should be communicated well to the candidate even in the recruitment and admission process. Given the situation that most of the students in many programs need to work in parallel with the studies, we see that students’ ability to cope with such comprehensive workloads are impressive, but we also see that this can lead to inadequate participation in studies. However, it is our understanding through both the

self-evaluation report and the site-visit that the SPG management, head of SPs and the faculty contribute to make this feasible.

The Estonian Maritime Academy campus and TalTech main campus showed us very good infrastructure with opportunities to enable both the student's learning process, but also act as infrastructure to bring the student into active research work. The geographical distance between the Estonian Maritime Academy campus and the main TalTech campus is, however, an issue that has to be managed to reduce transaction costs of being a student with subjects taught at both campuses. Better e-learning tools and applications should support this over time.

Regarding e-learning we saw a well-developed understanding of the Moodle platform and its opportunities. However, this is work under a development, where the notion and understanding of how e-learning can be developed to give benefit both on individual subject level as well as on program level requires maturation of how subject and tools can be brought together. E-learning have potential to bring the two campuses closer together.

Regarding the resource situation, we have seen very good physical infrastructure, many examples of excellent work done to make state-of-the-art tools available for students' use, and good availability of teaching staff. In sum, we think that the infrastructure for the program is state-of-art - or in process of developing into state-of-art, but that a focus should be kept on digital platforms and tools that are SP specific. As provision of and fees for software can be costly, the SPG should continue to address this strategically, also including how sponsoring of such software access can be developed and achieved. The SPG itself have good examples how this can be done.

A final word of thought. We have experienced a SPG with five SPs that all are proactive in their development to improve the programs for the better. That requires resources. There are many development and improvement activities on many levels and fields, but the human resource pool (SP management and teaching staff) is limited - although much good creativity is used in enabling support from stakeholders around the SPG. Hence, a comprehensive list of actions to be dealt with, but limited resources requires focus and the ability to prioritize. This has already been prioritized internally by a reduced set of focus areas, but additional resources on the SPG level, to focus and manage the actions in this period of high level of development activities to better enable the potential and use of the infrastructure should maybe be considered.

Strengths

Overall Conclusions:

- *Improvements in study program, teaching and learning, teaching staff and courses has certainly taken place - according to internal and external stakeholders; faculty, students, alumni and industry/organisations!*

- *Connection to the Estonian labour market appears to be good. Very positive and open feedback from labour market stakeholders!*

- ***Resource** availability is impressive. The newly refurbished Estonian Maritime Academy campus and the main TalTech campus both present state-of-art infrastructure for the further development of the SPG. Both teaching facilities, laboratories and library resources.*

- *Strong willingness to develop is definitely present. All SPs are characterised by proactive management, with a positive development attitude - which was reflected also by the student body met.*

- *Both TalTech and the Estonian Maritime Academy having a strong reputation in the market. This should be used on the SPG level to develop better formal collaboration options for students (internships and thesis problems).*

- *The merger of the Estonian Maritime Academy to TalTech has improved the Estonian Maritime Academy future options significantly. Stakeholders were quite impressed by development. It is a good scope for education and research collaboration both ways between the Estonian Maritime Academy and 'main' TalTech. Good examples of the latter can be found in the SPG.*

- ***Wide diversity** - in:*
  Teachers (hired by the hour, part-time, tenure track, research prof., visiting),
  In courses (covered subjects)
  Locations (many buildings, ship, boat)
  In personnel (practical vs theoretical)
  In requirements (some requested to contribute to research, others not)
  In students (company vs youngsters)
  In language (Estonian, English, Russian)

Improvement areas

- ***Wide diversity*** *- in: … see above: The wide diversity is a strength for the SPG, but also an improvement area. To achieve specialisations and scientific depth, focus is required. There should (as well) be room for more focus in some programs. For instance, w.r.t. requirements, if a more scientific research based approach is sought, then the SPG should require research contribution from all SPs, but assess in which format the contribution should come – this is to leverage the potential strengths in the practical versus more theoretical character of the SPs in contribution to SP and SPG research.*

- ***Salary level*** *in terms of offering a competitive package is a huge challenge for recruiting permanent faculty. Additional funding through research projects (domestic and international) as well as continuing education offers are options. TalTech and the Estonian Maritime Academy with their new resource pool are well equipped to become both research partner and provider of continuing education.*

- ***Language*** *is an issue. A clear choice is needed here. Our recommendation is to use English textbooks and materials, give the classes in Estonian and no more requests to teachers to translate. We have two reasons for this. First that the best availability of learning material is in the English language. Secondly, that teachers are in limited availability and should be used for more value creating activities than translating textbooks.*

- *Balancing between* ***theoretical and practical*** *for both the content of the courses and the attendees in the courses is a challenge. This is both a strength and an improvement area, where we have seen good practice, but also requirements for keeping with the theoretical part long enough to be able to make constructive use of theory in practice.*

- ***Class sizes*** *can be quite small (5-10). This should be assessed to see if there are opportunities to regroup classes and/or subjects to end up with more students per class.*

- *Important for the Estonian Maritime Academy to continue search for opportunities to get synergies from merger with TalTech - available resources in TalTech should be utilized as common subjects, labs and techno centers, training courses for staff and other support and development services. Resources are limited with the Estonian Maritime Academy and you have many actions to fulfill, hence do what you are best at and seek support from TalTech's general resources for the rest.*

- *Researcher education through PhD programs will necessarily require focus and depth. The researcher education plans through the TS SPG, from start via master level to PhD level, should be assessed and benchmarked internationally, with respect to requirements for scientific depth in researcher positions and the Estonian society and industry's need for*

doctoral candidates with deep discipline knowledge and professional research skills. Master level programs that shall qualify for doctoral education should have a minimum of focus and subject depth, to be able to qualify for continuing doctoral studies within a discipline. We regard the requirement for the MA programs to be stronger in contextual width, than basic knowledge for problem researching depth – that often is the requirement of a doctoral study. The master programs should also be assessed against requirements set by different, relevant research problems /scenarios, and how well they provide a solid basis for entering into doctoral studies within the transportation context.

- *Address the scientific quality level of the final thesis work of the SPs. We see an increased attention towards this, and one can expect changes in study plans to improve this, but still it should remain in focus.*

- *There were quite straightforward feedback by students about entrance exams (test and interview) that these are formal and very easy in MA and Port & Shipping area. A lot of students pass through, but will not find motivation to finalize the studies. The same feedback about internship, but it should give valuable input and practical experience for students. We understand that there is work ongoing to revise the format of the interviews to seek to improve the selection of motivated students.*

Recommendations

- *More focus is needed. This is (as previously commented) linked to the observation of wide diversity. Choices must be made on the inputs, process and outputs. Which inputs do we want to use, which processes are our core processes, and what do we want to deliver as outcomes.*
- *Especially the Estonian Maritime Academy should focus its efforts in study program specific development, and continue to insource support from TalTech for general development.*
- *Although we see a good development towards strong base subjects in the study plans for the SPs, we would like to see more strong basic discipline subjects in the MA programs.*

1.3. Strengths and areas for improvement of study programmes by assessment areas

1.3.1 Logistics (MA)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Evidence and analysis

The study program has undergone a revision that is reported by all stakeholders met during the site-visit to be a considerable improvement of the study program and its study plan. The study program is well structured into individual parts and the parts together make up a coherent whole that meets the learning outcome of the program. The program gives a broad and generic insight into logistics where engineering insight and business insight co-exist, and lead to the two specializations of supply chain management and mobility engineering. We see the co-existence of the two specializations as a strength of the program, as they give a good bridge between the required engineering and business side of logistics.

The activity of the study program strongly support a good interface between an academic knowledge basis and the logistics context and practice of Estonian business, industry, organizations and society, while securing knowledge and methods from academia to be used in identified cases and problems within the practice context. The width of the background and working relationship to business/industry/organization/society for the students - for example transport company to theatre management, show the wide value contribution into the Estonian society from the study program.

Hence, this meets the needs of the Estonian society, business and industry for qualified candidates with a broad business logistics competence as a driver for the development of the programme. Both the self-evaluation report and the site visit support that the study program is well developed for this. This is a strength of the program, but also just one out of two main requirements for logistics expertise in a society. The other is the deep logistics resources optimization and system analytical competence required for state-of-art logistics development and management in a modern society. This was both reflected upon by the

assessment team, and also commented from both faculty and industry stakeholders in the site-visit.

The study program management and the lecturers had experienced a softening of the quantitative analytical skills of graduated logistics bachelor candidates. This was also raised as an issue from the employers side, and as well as a question by the assessment team. The bachelor (BA) in logistics is now given as main speciality: Logistics and supply chain, in the Faculty of Economics. To achieve the development of logistics candidates with strong quantitative and data analytical expertise the assessment team thinks this is a development in the wrong direction. Analytical tools for optimization of resource-use in logistics, used to develop and operate resources in all four transport modes - roads and trucks, railroads, ships and airplanes, and in all nodes - terminals and warehouses, ports and airports, is based upon data analysis and operations research based methods. TalTech should develop such candidates as part of their logistics and transport programs, and the bachelor in logistics and supply chain management is the starting point for this, requiring strong background in quantitative analytical methods and skills. This is contrary to the signalled softening in the bachelor program. As the MA program in logistics is a relevant and natural continuation from the bachelor program, the assessment team raise this as an issue to be dealt with.

Study programmes in logistics from the Danish University of Technology, Chalmers University of Technology, and Aalto University were the background for the former study program in logistics. Based upon this, insight through project collaboration with Riga Technical University, University of Wuppertal, and the Polytechnic University of Milan has influenced the development into the study program as it is today. The linking of business subjects and engineering discipline subjects is central in this. However, this again requires that the admitted students` background knowledge in basic engineering subjects are upgraded in accordance with the requirements of the study program study plan.

Both the self-evaluation report and the site-visit has documented a broad and active student group, with active study program management. Several study visits to companies are arranged by the management of the study program. The proactive focus and actions of the study program management, have been noticed by the assessment team both from the self-assessment report and from comments by all stakeholder interviewed in the site-visit.

Due to the use of Estonian language in the lecture situation there is limited availability for foreign non-Estonian speaking candidates in the program. In logistics, there are a very good availability of textbooks and digital learning material in the English language. The use of such learning materials would have supported international students. However, the atmosphere of the program is an active student body where the use of practical cases – often domestic or local, that have to be discussed and developed in collaborative work is important. This is hard to combine with international students at the same time as Estonian is the working language of the program.

The study program has an active relationship with the organizations, business and industry in logistics, that gives the students examples from a variety of organizations and roles where logistics knowledge contribute to sort-out problems and support development initiatives.

The structure and content of the modules and courses in the study program, and the way they are related to the practical context is supporting the achievement of the learning outcomes of the study program. Altogether, the study program significantly contributes to a broad development of increased logistics competence in the Estonian society. In total, the parts of the study program form a coherent whole. Both in the main field of logistics and for the specializations of supply chain management and mobility engineering. By assessing the study plan, we regard the main field of study to be more than 50% of the study load.

Strengths

- The study program is a strong and important contributor to development of logistics competence in the Estonian society, business and industry. This is an important role of the study program that should not be forgotten. The width of subjects and disciplines in the curricula is a strength for this development. This is in accordance with the role of programs in business logistics as seen in the international logistics context.
- The study program management has done a very good job in redeveloping the program into its current form, and that is an important part in achieving the role and contribution of the study program in the Estonian context and to the Estonian society.
- We see the co-existence of the two specializations (Supply Chain Management and Mobility Engineering) as a strength of the program, as they give a good bridge between the required engineering and business side of logistics. Set into the development trend were new technology come into more and more applications in logistics, we regard this to be both a smart and strong combination. However, it is demanding to bring all candidates - also those without an engineering background or insight into basic engineering knowledge, up to the required level of competence required for parts of the study plan - especially the engineering related subjects.
- We see the program's use of theory and practical examples as a good way to develop candidates for the Estonian society with both good theoretical background, insight into logistics as part of a diverse set of organizations in the Estonian society, and also skill developing training in case analysis individually and in groups of students.
- The combination of theory and practical exercises in real life and laboratories is relatively well balanced in limited investments to study resources. Good level of creativity.

Areas of improvement and recommendations

- Increase the quantitative analytical capabilities of the students of the program. As we have stated above, the study program is a strong program delivering a good study that is sought after (high market demand for the candidates in a wide range of branches in society, business and industry). We also acknowledge the quantitative analytical contribution to the learning outcome in subjects like EML0080 Demand Planning and Management, MMK5270 Business Process Management, ETT0330 Urban Mobility and Traffic Modelling, and EML0060 Economic Influences on Logistics. However, as questioned by the assessment team before the site visit, and stated by the industrial representatives and the study program management in the site-visit, there is a need to:
    - Introduce a pre-course requirement to improve basic/core analytical capability and capacity. The course should be compulsory for students admitted to the programme that do not have a background in technology or engineering, quantitative economics, or similar studies with a given level of development of quantitative analytical capabilities. In this regard, we need to develop factual knowledge so that it can be used to support reflection and critical thinking in the logistics and mobility context.
    - A new set of courses that can be chosen as elective subjects that for students of a given quantitative analytical capacity can further strengthen their analytical capacity and knowledge of methods used in logistics analysis and within logistics analysis tools. The new set of courses should be related directly to methods of operations research (optimization and simulation) and supporting subjects to these (algorithms, data structures, data analysis, databases).
    - The BA study program in logistics and supply chain management should be re-evaluated. The BA study program in logistics is not part of this assessment, but as a program that is directly preceding the MA Logistics program, it have to be raised. Both as it is directly commented upon as an area of concern by the industrial stakeholders, as well as regarded as a negative development for the logistics MA program by the assessment team. To develop a strong engineering, ICT and (quantitative) economics understanding as also stated in the previous assessment report, to prepare for deeper analytical and system development tasks of a logistics professional, the BA study program and most probably its organizational placement (which school and department) should be revised.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Evidence and Analysis

Budgeting and use of resources is mostly related to the teaching process, described in the self-evaluation report and exemplified in the site-visit. A note here is to remember that many resources have their primary relation to the mobility engineering part of the program, while supply-chain management historically have had more students - note: mobility engineering had an increase in student intake fall 2019. In this context, it is important to remember the benefit of mobility engineering resources also for the supply chain management part of the program.

The library resources are very good, both as accessible via the internal network of TalTech and as physical access to the library at campus (24/7). With a focus more on digital learning, the role of the library in the learning process will not be reduced, and most probably increase. Hence, it is good to see the scope, accessibility and quality of the library resources.

The laboratories from mechanical engineering are a very good resource for explaining the practical side of theories of motion. Related to all transport and mobility, the laws of motion are central and a basic understanding of these are important. The laboratories can further give insight into measurements of emissions from engines, and noise and vibrations. Hence, the mechanical engineering lab and the autonomous vehicles lab are important resources for the study program as they give insight into basic tests and as well as research that exemplify technology that can be found in future mobility and logistics solutions.

Study process facilities in general were found in general areas on campus - accessible for all student, classroom settings, as well as laboratory spaces as the logistics "LogInn" laboratory. Although the "LogInn" lab was not yet fully equipped, it was in development and it is our belief that it will become a central lab for the students especially in their practical case work. It should be noted that a good logistics lab will require software solutions with access to relevant logistics tools. That will most probably require fee-based software services. Note: Students should actively be used in planning and feed-back (how they see use of the lab in their learning process and case work, and improvements that could be made) on the development of the "LogInn" lab. To attract funding for resources

for the lab, a (set of) sponsor(s) for the lab should be sought. For instance - the 'Company Name' TalTech "LogInn" lab.

The TalTech e-learning environment MOODLE is used, but maybe not to the extent of its potential. It is our understanding that the program had started to use social media platforms actively in communication internally among students and for open communication from the study program. As commented in the site visit, the not optimal use of Moodle 'was OK, because we have Facebook'.

Strengths

- The lab resources give strong support for the co-existence of the logistics/ supply chain management and the mobility engineering specialisation.
- The companies and sites visits also giving valuable input and understanding into different industries and connection between them.
- An active Program Advisory Committee and the relationships to their Alumni.

Areas of improvement and recommendations

- The new LOGINN lab - under development, should develop access to relevant analytical software relevant for logistics and supply chain management.
- The LOGINN lab definitely should cover the need of simulation and visualization of different parts of supply chain as well SC as a whole chain (physical goods flow, information flow, financial flow etc.) in order to be able to simulate and design optimal solutions for industries.
- Collaboration between other HE institutions can be developed. TTK University of Applied Sciences has invested in simulation software for supply chain and transport planning and WH simulation, which could form a good basis for collaboration, as well as a means for recruiting more students in the logistics MA program.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.

- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Evidence and Analysis

The background of the student group in the program is quite wide, and it is our understanding that the student group's level of competence in a subject is used to adapt either the starting point for the lectures in the subject, and/or the process throughout the subject to achieve it intended learning outcome. Hence, we see that the process of teaching and learning is quite flexible, and adapted to the students` background. The use and scope of self-study is also important to achieve this.

The methods and tools used in the teaching varies dependent on the character of the subject, and as presented in the study plan and through the site-visit we see that they give a good support for the intended learning outcome.

We experienced, both from the presentations by the teaching staff and the program management, as well as from the students that the program set high emphasis to bringing good practical examples and academic cases into the study program.

Development of a digital culture is both achieved through use of digital tools in courses, but not least in the use of digital platforms in communication with external stakeholder groups and in case work, through diverse social platforms. The development of the "LogInn" logistics lab can become a strong part in developing digital analytical group-work and presentation skills, but will require that a relevant set of software tools are made available to the students and also made use of in the taught subjects.

Strengths

- The study process is well balanced process with theory, connected practical laboratory works and also supported with company and site visits.
- Flexible studies, afternoon or evening lectures which enables students with different background effectively participate with combination of work and studies.
- Groupworks where individual and collaboration skills can be demonstrated.

Areas of improvement and recommendations

- It is necessary to have leverage courses for entry students to calibrate the skills of some basic subjects in the field of engineering.
- Needs to assure that the level of the learning outcomes of the early engineering related courses are achieved independent of the students' level of knowledge at start and related need to adapt the teaching process.
- The lecturing of core/relevant methods and the use of tools that use/support the methods should be a more visible part of the program. This should also be well integrated into the LOGINN lab.
- The size of some classes is often quite small. This will raise the question of the added value of the course concerned in the longer run to the Programme. The number of students attending classes should be increased by e.g. attracting more students, merger of courses, etc.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Evidence and Analysis

An enthusiastic and motivated teachers and research team takes care of this programme. They use modern teaching methods such as active learning, e-learning, company visits, company examples in class, case studies, group works, etc. Especially the group work encourages students from the companies (70%) and the students coming from a Bachelor (30%) to mix and exchange their ideas and experiences. Good students are encouraged to do more and given extra assignments. Teachers are both academic staff and part-time hired staff from outside (usually companies to encourage the link with practice). As we have read

in the self-evaluation report and experienced in the site visit and interviews, it is our understanding that the teaching staff has good qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning. The teaching staff cover a comprehensive range of topics, from core engineering topics within mechanical engineering, via logistics infrastructure engineering like road networks and ports, to design and assessment of procurement systems, risk assessment of logistics system operations, as well as constructive and critical analysis of new (digital) technology. Both the permanent faculty and the temporary staff gave a very good impression of their insight into the program, its learning objectives and the opportunities and challenges of the mixed student group in the program.

Teaching staff assessment takes place via the students. If teachers are not performing well than the teachers are offered courses to improve their teaching performance. Career development plans are discussed once a year.

In most cases the research and thesis work is quite different from the teaching which means that linkages between research and teaching are difficult to be made. The balance between teaching and research is approximately 50-50 and this is seen by the teachers as good. A good thesis is consisting of an analytical, theoretical, and simulation part. A good thesis should also be written in good Estonian language.

The assessment team has not found evidence of a course and corresponding teaching staff in operations research methods and tools, and methods and tools for data analysis. It is our understanding that a good course in operations research - methods for building optimization and simulation models in logistics, and hence teaching staff for such a course should be part of the permanent or temporary teaching staff of the study program. There exist a large portfolio of analytical tools used for analysis in logistics and for operational decision support in logistics that are based on operations research methods, and the students should be introduced to such methods and tools. A longer-term objective should be that the students become exports in such methods and tools.

Strengths

- The blend of permanent faculty and temporary staff - represented by those we met in total, we regard as a strength of the study program. Also, the blend of teaching staff from engineering faculty with staff from a business logistics background we regard as a strength of the program, contributing well to the special profile of your program. This should be kept and emphasised even more strongly.
- The head of the study program is a strong resource for the program, especially for the strategic vision of the program and managing the blend between permanent faculty and practitioners as teaching staff, and staff

with engineering versus business logistics as core discipline, and actively bringing industrial cases and visits into the program.
- The teaching staff presented an understanding of the requirements of the study program - seen from their discipline, that in sum we regard as a robust platform for the program and strong mechanism for further development of logistics programs at TalTech.
- Flexible teaching and learning format take into account the specifics of the form of study, where active use of case studies supported by teaching staff contribute to bring discipline topics taught in courses together.

Areas of improvement and recommendations

- There is a wide diversity of courses. On the one hand, this can be a strength on the other hand a point for improvement. In this respect, more focus is needed and a teaching strategy should be implemented for this Programme. The strategy answers questions like what, why, who (Estonian or EU), and how (in which language) do we teach?
- The link between the Bachelor and the Masters Programme is a point of attention. The basic Engineering knowledge must be on a good and agreed upon level and links to the discussion of Engineering, Economics, Management and Logistics. The teaching staff of the program can be a strong development resource in this respect.
- The link between teaching and research should be made more visible for mobility engineering. We saw much interesting research that were relevant for mobility engineering, and this should be made more visible both in the marketing of the program and how it is integrated in the study plan. We understand that this is work already under development, and we strongly support this – both for the *Logistics and SCM* branch and the *Mobility Engineering* branch.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Evidence and Analysis

Approximately ⅔ of the students come from industry, while the rest continue directly from a bachelor study. Graduates from the BA study in logistics are an important group of candidates into the logistics MA program. The students come from a variety of backgrounds, that both show the wide applicability of logistical knowledge and competence. Also, the width of the students´ background is a resource in itself in the program, as they bring different industrial cases and viewpoints on logistics into use in the program.

The students are enthusiastic, the interest in practical examples has grown and the report writing capabilities of the students have improved. These both cover regional and national Estonian issues, as well as international issues in logistics. The classes are quite small and on average courses are given to 5-10 students. Classes start late afternoon to give working students the opportunity to attend. The workload of the working students is very high. Usually they have a full-time job of at least 40 hours a week and additionally, studying requires another 20 hours.

The students´ motivation is an important contributor for the very low drop-out rate documented as (5-7%). This was also confirmed by the students. A high employment rate and salary-level of the students secures that the demand for the candidates from the study are good.

Students and alumni confirm that a very good development of the study program has taken place the last year(s) that have significantly improved the program.

The employers are satisfied with the students - though the results and levels of the thesis' varies. However, they ask for more quantitative analytical capacity and capability.

The admission to the study program is based on an assessment test with five parts, of which a minimum score is required, and an interview with the candidates.

The students had mixed feedback on the MOODLE tool, but stated that they managed well through group Facebook pages.

The student mobility seem to be quite low. It is our understanding that the program is mainly for domestic and local students that take the program in parallel with their daily work. However, the mobility engineering /SCM blend should be interesting also on the international education program arena.

Many students also come from a small business background which should be taken into account as well regarding the study program.

The teachers signal that the basic engineering knowledge has gone down over the last years. Especially the quality of the Bachelor Logistics entering into the MA program needs improvement.

<u>Strengths</u>

- The program aims at students with a wide range of backgrounds, hence contributing to distributing candidates with logistics competence to a wide

range of areas in the Estonian society, organizations, businesses and industry.

- The market demand and market opportunities within the Estonian society, business and industry for candidates with a logistics education are high, and is a clear driver for student motivation.
- The student body is active and as a group enable many relevant companies` visits to get insight into different parts and tasks in a supply chain. This is also supported by the alumni.
- The blend within the student group between those with an industry background and those that continue directly after completing a bachelor or vocational study is a strength for the program.

1.3.2. Maritime Studies (MA)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Evidence and Analysis

The maritime studies programme is the only maritime master study programme in Estonia and has been approved by the Council of TalTech and the Ministry of Education and Research. The maritime business is significant for the Estonian economy, so the MS programme has a main objective to offer further education to candidates already employed in the Estonian maritime industries, or candidates that seek a position within the Estonian maritime industries.

In the self-evaluation report the study programme and development of this has been outlined in a comprehensive manner. The programme was revised in 2017 where the members of the programme advisory committee were actively involved. The study programme was finally approved in November 2018. First admission to the recently reformed programme (version VAAM15/18) took place in the academic

year 2018/2019. The study programme complies with the Statute of the Curriculum of the Tallinn University of Technology.

The study programme (120 ECTS) has two main specialties: Shipping Management and Technical Exploitation of Ship and Navigation. One of the most important changes in 2017 was unification of courses, i.e. the volume of each course was set to 6 ECTS. This required a thorough review of all courses in terms of structure and content.

The following are the findings that can be highlighted:

Strengths

- The programme is the only master's level programme in Estonia in the maritime field. This is an advantage in terms of getting more applicants to the programme.
- The programme can supply candidates with wider knowledge to the maritime business field which is so significant to the Estonian economy. This is important as business changes continuously.
- The interview of employers revealed that the academic level of master theses has improved significantly on the analytical side as a result of the merger. This development should be continued.
- Web site information is regarded as good by the students.

Areas of improvement and recommendations

In the self-evaluation report, the following is highlighted:

- Unsuitable timetable at TalTech main building for full-time employed students.
- Insufficient internationalisation of study programme. This can be understood from the combined employment and study in parallel context of most students.
- Insufficient number of guest lecturers.

From the study plan, we can see:

- The name of the specialisation *Technical exploitation of ships and navigation* communicates a focus on technology and use of technology for improved solutions for ships and navigation. However, technical subjects are part of the 'optional courses', where 18 credits out of 30 are to be chosen. Hence, in consequence, a student can choose the specialisation and avoid to select core technical subjects in the program. This stand out a bit peculiar in this program and deserves to be commented within the program.

We have revealed the following from the interviews:

- The employers expect EMA to do more in order to invite guest lecturers from the industry which can inform of daily business in the maritime segment.

- Students should get internship in companies relevant to their professional goals so to better understand daily work and develop practical problem solving skills. Such internship is welcomed by the students. We understand that this in general is achieved through their own employment contract, but should also be supported for students not having their daily employment in the maritime industries.
- Employers should continue participation in planning of focus for the development of the programme. This to secure that the students set of knowledge and skills after the studies are in line with the expectations of the employers, hence clarifying expectations and set focus towards agreed intended learning goals.
- TalTech and Estonian Ports Association should have more tight interaction, e.g. 1-day site tours.
- Proposal for new business opportunity from an employer is to develop a study programme in maritime law.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Evidence and Analysis

The courses of Maritime Studies are provided via at least two buildings. There is no lack of teaching rooms or other discussion rooms. Given the large attendance of practitioners from companies as students, many lectures are held at the end of the day and beginning of the evening. The classrooms concerned are very well equipped with the most modern technologies and state of the art architecture have been used to refurbish the very nice old building. Given the time of the lectures, also groupwork and e-learning are used extensively to enable end-of-day studying for the students and the teachers. The main library of the campus of TalTech is open 24/7 and offers rooms for students to discuss, work and learn. The language of learning books still is an issue. Many books are in English, but translations are made by teachers into Estonian.

Strengths

- Adequacy and good fitting of classrooms and other facilities.

- Very good equipment with modern technologies and technical means for studies.
- TalTech library is accessible for all Maritime Academy students and lecturers as well by distance and through VPN.
- Special e-literature and accesses available for maritime area.

Areas of improvement and recommendations

- As having a wide range of different tools available (simulators, labs, soft wares etc.) then it is recommended to work out a continuity plan how to secure future development of the tools, reduce the risk of updates and take care of sustainability on teaching staff and keep the know-how in house.
- Moodle as a modern learning platform, course management system (CMS) usage opportunities needs to be fully utilized in order to improve study process towards students and make daily teaching life more effective also for teaching staff. TalTech has created even central support to train usage skills and as well handle technical issues. Given this availability of centrally administrated courses and other support resources, we recommend that it is evaluated whether e-learning development courses should become obligatory.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Evidence and Analysis

The teaching and learning process is managed under the supervision of the Maritime Academy's Development and Quality Office at the Centre of Academic

Affairs. In the self-evaluation report it is mentioned that feedback surveys among students and other target groups have an objective to identify whether the teaching staff select the teaching and assessment methods in accordance with the goals of the study programme and courses. The Head of the study programme then coordinates work related to teaching methodology, draw conclusions based on the feedback received, and submits proposals for improvement of the quality of the teaching process. Given that this is fulfilled, then the process of teaching and learning is focused on supporting the achievement of the program's intended learning outcomes.

The self-evaluation report, under the *Study Program/ SP Development* part, also gives a very good description of the teaching and learning process as part of describing the courses, the responsible units for the courses and how the courses come into the specialisations. It is written in a way that, at least for the assessment process, are appropriate, transparent and objective, and with a direct focus towards the students' achievement of the intended learning outcomes. Hence, it is important to review the SP / SP Development part in relation to the teaching and learning process.

For study load, 1 ECTS credit is said to corresponds to 26 hours of study. A lecturer is obliged to ensure that the time used for a course, including independent work, does not exceed the prescribed volume. The volume and content of independent work shall be described in the syllabus of the study programme. The interview of students gave us the impression that the workload in different courses corresponds to about the 25 hours per ECTS.

The program has good and long experience in the use of e-learning tools. Hence, the Education Technology Centre of TalTech and the educational technologist at the Maritime Academy have been important for the SP, and show the program's use of modern teaching methods and enabling the students' digital culture. This provide a good flexibility in the study learning process for the students. It will also support the learning mobility of the students, as their courses are available wherever they are at the push of a button.

Practical training is included as part of courses, also as internships in companies. In practice, much of the internships are in relation to the student's own working situation, where the students also find problems for their master thesis work.

<u>Strengths</u>

- Academic staff members from other faculties of TalTech are involved in the teaching, which gives a wider academic scope and elevate the scientific level.
- The students have good feedback about the teachers during the interviews.
- The use of e-learning has a good level of experience in the program.
- More opportunities for students after the merger.

<u>Areas of improvement and recommendations</u>

- We understand that changes in the feedback system have been addressed also in collaboration with the students. Into this process, we want to suggest that a change in the feed-back mechanism could be to have a student reference group per course/class. The student reference group act on behalf of all students in a course/class, and is responsible to bring constructive feed-back for the improvement of the course between the students and the course responsible and teachers. This is a change in feed-back mechanism that could be used for all SPs in the SPG, as students in more than this SP has commented that the course feed-back mechanism is not working to its intention. The process could be that the student reference group have two meetings per semester with the course responsible and teachers, where they present their feed-back and where this is discussed. After the meetings, the student representatives report their feed-back through a report – should be standardized for this use and equal for all courses. The first course should be held about one third into the semester, and the second in the last part of the semester. In addition to the student group report, the course responsible should also compile a report about status and development plans for the course, where the comments in the student report also is commented. It should be stated that the purpose/mandate of such a process is to establish a constructive feed-back/development process for a course, where the students are brought into the process in a direct and constructive way, where they have to be responsible towards the development of the course and how it could be improved to better achieve the intended learning outcomes – the learning objectives are set by the course responsible and not open for discussion as part of this process.
- Courses to refresh pedagogical skills and e-learning tools should be made mandatory with specific time frequencies. This also applies to all SPs, as there is a need to train pedagogical skills as part of teaching processes, and e-learning tools develop and we (the teachers) should develop alongside their development.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.

- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Evidence and Analysis

The following lists of strengths and weaknesses reflect the assessment team conclusions studied through applicable standards. Bases for interviews and data collection were study programme self-assessment report, previous assessment report, reported improvements and latest revisions of study plans. Interviews offered two way communication between assessment team and teachers resulting in multiple findings with potential to enhance study programme suitability and performance.

Maritime studies study programme teaching staff appears as a good combination of industry matured professionals and younger staff members forming a well and openly communicating team with clearly good working atmosphere. Maritime training has recognized multiple improvement points of which many originate to governmental or cultural aims and objectives, while some have been achievable for improvements by the faculty staff.

Strengths

- Research efforts for maritime studies have been supported significantly by the merging with TalTech.
- Connections with industry are tight and external resources are widely used for teaching resources
- Teachers have influence in the content and structure of training programmes
- Merger with TalTech has encouraged teachers self-development
- TalTech offers internal pedagogical training for teachers.
- Annual working plan includes teachers to planning and provides look ahead and eases planning
- Educational technologist releases teachers resources to their core tasks
- Educational technologist eases utilization of modern teaching aids and e-learning facilities
- Curriculum council includes industry members meeting bi-annually

Areas of improvement and recommendations

- There is still room for improvement to seek mutual interests from other study programmes. Multiple opportunities for collaboration with larger TalTech is left somewhat untouched. For example in thesis projects, further collaboration could add significant value and improve the quality of both study program and thesis. Generally, merger with TalTech has been successful and benefits are recognized but transparency between study programs towards TalTech would introduce valuable information for study program development.
- It was observed that many students take the feedback process very lightly. This jeopardizes the quality of the feedback results, which is challenging given the importance of the feedback results. Considerable weight is being placed on course feedback as a mechanism for teachers` evaluation. This feature is visible throughout the spread of curriculums and is further reflected in the overview section of this report. The feedback process should not have too much gravity for evaluating teachers`abilities. Although student feedback is an important channel for data in this matter, one must remember that we are talking about students evaluating their teachers. Making pedagogical assumptions based on this alone is questionable. For example, if student feedback average is below certain average for a single teacher, he/she is encouraged to participate to an internal training programme provided by TalTech. Heads of study programmes should have a closer understanding of the status of the teachers and learning in their study programmes. This can be achieved by communicating more efficiently.
- Industry stakeholders evaluate quality of masters` thesis reports being lower than general average. Considerable amount of theoretical studies is visible for employers as lack of problem solving abilities. Readiness and capability for literal expression is not in line with general educational standard seen as low quality of thesis report and failure to finishing the thesis resulting in not graduating. Students often fail to see the necessity for high amount of high level theory making the feel they are sliding away from operational reality. The study program should discuss their experiences of this with the Logistics MA study program, and their actions and experiences in establishing closer contacts with industry and employer side stakeholders for the benefit of the students` assignments, case-work and theses work.
- As indicated during last assessment only very few members of the staff have a PhD degree. This issue is being addressed as now there are few personnel attending doctoral studies however value added to gain doctoral degree should be made visible by the employee as gaining a doctoral degree is not adding value only to individual subjects but to the entire study program.
- Motivation seems to be a summarizing element when seeking for reasoning for high amount of dropouts. Supportive mechanisms should be established to upkeep student motivation throughout studies. Events and reasoning behind drop out (failure to succeed in studies) or quitting studies (personal reasons) vary between individuals and training programmes. In maritime training programme major factor for

discontinuing studies is employment contract during studies. Composition of maritime training programme varies from others as vast majority of students in masters training programme are working full time. Attractions to focusing on work and earnings override importance of graduating leading quitting studies or dropping out as a result of non-advancing studies. Motivation could be increased by including use cases and practical problem solving tasks to combine applied research with practicality. As this is a common challenge for several study programs in the SPG, it should be discussed with the Logistics and Waterways Safety Management programs to have their experiences and learn from their actions. Writing tasks should be given to students to strengthen their writing skills and ease the threshold of aiming for excellence in thesis work and graduating in a timely manner.

- Study materials are in Estonian and teaching language is Estonian. We recommend the SP to evaluate the consequences of using more study and learning material in English language, and not use scarce teaching staff resources to translate material into Estonia. The value of the teaching staff lies in lecturing core material and supervise students. Developing study/teaching material should be for the sole purpose of developing material with a specific purpose, not available elsewhere.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Evidence and Analysis

The following lists of strengths and weaknesses reflect the assessment team's conclusions studied through applicable standards. Bases for interviews and data collection were study programme self-assessment report, previous assessment report, reported improvements and latest revisions of study plans. Interviews offered two way communication between assessment team and teachers resulting in multiple findings with potential to enhance study programme suitability and performance.

The students in the Maritime Studies SP seem to have a good working atmosphere where individuals support each other. A high number of dropouts and students that quit their studies, underlying challenges appears to be of motivational and lingual nature. Students interviewed presented themselves as a clearly communicative group of motivated future professionals that recognized and presented multiple valuable improvement points.

Strengths

- Access to study material and research literature has improved significantly.
- Students and teachers have an overall positive relationship based on firm trust and good communication.
- The student council have direct communication lines to the board.
- The student council collects course feedback data on TalTech level.
- A supportive, forward pushing and positively competitive atmosphere.

Areas of improvement and recommendations

- Integration of Russian speaking students is challenging. In the beginning of studies, Russian speaking students often are a majority. In the interview, fourth year students reported that only few Russian speakers were still present and within the study group. These individuals were the ones that were most self-driven in collaborating with Estonian speakers, while the larger part of the Russian speaking group had quit by then. This indicates an integration challenge and calls for mechanisms from TalTech for rectifying the issue. Russian speakers should be encouraged to join the surrounding Estonian speaking community and vice versa. This leads into social connections and teaming with each other. Tight social connections is the glue that keeps the team together. The fact that almost all teaching takes place in Estonian, places Estonian as a working language resulting in a minority role of Russian language. This even though Russian speakers often are majority in numbers in the beginning of study. This is a political will as much as a cultural status in Estonian education system. Given that the Estonian language is kept as learning language in the program, it will necessitate an improved Estonian language training for students with a foreign mother tongue.
- Motivation during studies is at times poor and increases risks to quitting studies. Reasoning seems to be a combination of things, mainly related to not seeing the relevance of own studies in the future working life. Threshold to leaving studies is low as getting a study is very easy, as students responded during interview. Many of those that qualify through screening and commence their studies, have this study programme as their second or even third option. When they do not reach their primary

goals, they commence studies in their secondary or third study programme options. While studying they continue seeking study programme entry from their primary targets elsewhere. Mechanisms should be established to create and maintain students` interest and motivation to their studies to pursue towards excellence in their field of study. This could include participation from industry stakeholders to have concrete connections to future employers already during studies. Primary study place option should be granted with extra points, so threshold to qualify to primary choice would become relatively lower than secondary study place options.

1.3.3. Navigation (Professional HE)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Evidence and Analysis

The wording navigation can mean navigation in the ocean space, on the Earth`s surface, in the atmosphere or in the Space. As this study programme has its clear mission to educate deck officers on floating vessels, we find the name of the study programme inappropriate. A deck officer needs to master several techniques to handle a vessel safely and efficiently from one location to another under various marine traffic and environmental conditions. This requires knowledge of a stream of subjects (e.g. navigation, ship stability, ship operation, meteorology, oceanography, maritime laws). We therefore suggest that Nautical Science should be considered as naming for this study programme.

The specific objectives and outcomes of this programme are based on regulations by the International Maritime Organisation (IMO) in its International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW).

We acknowledge that the STCW convention set an international standard, but this is to be considered as a minimum level, and does not restrict TalTech to include topics in teaching and simulator training to prepare the students for e.g. more complex maritime operations (that demands deck officers) and trends in development of technology.

An element of research-based lectures can easily be integrated in this study programme by e.g. inviting academic staff from other faculties of TalTech, other national or international universities/institutions. We understand that part-time teachers (for instance retired Captains, or from the industry or other institutions) are involved in the study programme, but these are – as we understand from the interviews – teaching mainly topics to cover the STCW requirements. We suggest relevant guest lectures by full professors or associate professors as a way to introduce a higher academic standard in the education of deck officers at TalTech in the short term. We believe the students will benefit from being introduced to research-based maritime topics in addition to the classical teaching in STCW-subjects.

We find that TalTech`s participation in the international network of simulator facilities represent an excellent opportunity for further development of this programme in terms of enhanced simulator exercises, data gathering for research purposes, and international collaboration.

Strengths

- Participation in an international network of simulator facilities for co-training.
- Positive feedback from alumni and employers with respect to readiness for work.
- TalTech has a large pool of academic staff members in many research fields that can benefit this faculty.

Areas of improvement and recommendations

- Rename the programme to Nautical Science as this better reflects the actual purpose of education as well as possibilities for research in a broader area than the field of navigation.
- Include guest lectures by professors or associate professors from other faculties and/or national/international institutions to introduce research-based teaching in STCW-courses in addition to the standard teaching.
- Involve alumni and employers in further development of the programme. Feedback from interviews were that they have not been contacted in this respect.
- Let the students get an early at-sea experience, e.g. 1 week onboard a ferry as a `trainee` in the very beginning of the first semester. This is in order to see how the various categories of a ship`s crew are actually working. Hopefully, this could affect the motivation and drop-out rate in a positive manner. Using the Maritime Academy's yacht "Tuulelind" is a good starting

point for this, and sea-experience onboard professional vessels can come as a follow-up, and in line with STCW training requirements.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Evidence and Analysis

The resources for the Programme are very well developed. The tour given to the assessment committee was very impressive and also the enthusiasm of the lecturers was good to see. Extensions of the simulation rooms is ongoing and will add additional features to the already impressive study facilities. The Simulator Centre and laboratories have an excellent technical infrastructure for first-class education and training of the students. We understood from the interviews that the improved physical resources were a direct and welcomed result from the merger between the Estonian Maritime Academy and TalTech.

The link to practice and the international connections are very well developed through courses given to companies and participation in international projects. Availability of foreign language study material is limited since they are expensive. Staff has invested effort in preparing Estonian language study materials in specialised areas. The field is predominantly applied, therefore not so many scientific papers are issued.

Strengths

- Modern Simulation Centre with ongoing renewal.
- The teaching facilities (classrooms, projectors, PC lab, laboratory) and library are of a very good educational standard.
- Participation in international projects and also the link to practice (company training).
- The Simulator Centre represents a unique source for data gathering that can be applied for research purposes for TalTech professors as well as international collaboration.
- The interviews made it clear that technical support for the simulators was regarded adequate. (The fact that technical equipment occasionally will

experience downtime is also a learning outcome for students as this is something they will experience at sea.)

Areas of improvement and recommendations

- The continuing renewal and updates of learning software can be expensive. As having a wide range of different tools available (simulators, labs, soft wares etc.) then it is recommended to work out a continuity plan how to secure future development of the tools, reduce the risk of updates and take care of sustainability on teaching staff and keep the know-how in house.This task has to be addressed by all study programs using the tools, as well as the Traning Centre.
- Availability of foreign language materials is limited since they are expensive (p63 of self-evaluation report). This cannot be presented then as a strong point (p65 self-evaluation report). Furthermore, study literature published in Estonian is presented as a strength. A clear choice is needed here. In general, our recommendation is to use general study materials in English and conduct the teaching in Estonian. Now already overloaded teaching staff is requested to prepare (or translate?) study material which is not their core task and could be done by a translator.
- The usage of the technologies, tools and software is a point of attention. What is the utilization rate of the respective ones? If we have the most modern equipment but it is just used 10 days a year and we pay large fees for updates are these investments justified? We understand that this is analysed and assessed thoroughly, both as there is an important part of achieving strong learning outcomes, as well as that also navigation is strongly influenced by the ongoing development of technology and tools. We recommend to continue this, and as part of TalTech and the potential access to diverse and focused technology disciplines, the technology profile could be a side strength of the TalTech/Maritime Institute navigation program.
- Moodle as a Modern learning platform, course management system (CMS) usage opportunities needs to be fully utilized in order to improve study process towards students and make daily teaching life more effective also for teaching staff. TalTech has created even central support for that to train the usage skills and as well handle technical issues. In the self-evaluation report and during the site-visit, we have been told about the availability of TalTech support courses and support staff, but we haven’t seen formal measure to what degree it actually is being used. We recommend that a formal follow up – register and prepare statistics of use, of the use of TalTech support courses. This is important in the process of the whole SPG in this after-merger phase, to secure the best and fastest take-up of central TalTech tools in a best possible way. We acknowledge that this is development work in progress.

- Encourage academic staff members from other faculties and international collaborators to use the excellent simulator facility for research purposes.

- Encourage students to participate in research-based simulator test experiments, e.g. as subjects or technical assistants. This could help on their motivation as well.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Evidence and Analysis

An element of research-based lectures can easily be integrated in this study programme by e.g. inviting professors or associate professors from other faculties, national or international institutions. We understand part-time teachers (retired or from the industry or other institutions) are involved in the study programme, but these are teaching mainly topics to cover the STCW requirements. We suggest guest lectures by full professors or associate professors as a way to introduce a higher academic standard in the education of deck officers at TalTech – especially in the short term. We believe the students will benefit from being introduced to research-based maritime topics – in addition to the important classical teaching in STCW-subjects.

Student mobility is preferred to be encouraged by exchange agreements with foreign universities. We do, however, acknowledge that financial implications can make student mobility difficult for TalTech students, whilst international exchange students may face a language barrier. We also acknowledge that TalTech will keep and strengthen the Estonian language in the maritime education – for national reasons.

The requirement for continuous development of teaching skills should be made compulsory for faculty members appointed during the past few years. A teaching portfolio should therefore be required for staff members for which permanent

appointment requires that he/she makes a teaching portfolio that satisfies the pedagogical qualifications required by TalTech.

Strengths

- The pool of academic staff members (professors and associate professors) from TalTech enables a higher academic level for the education in some STCW courses.
- Individual courses have about the same workload.
- e-learning facilities are used when deemed possible and appropriate.

Areas of improvement and recommendations

- Professors and associate professors from TalTech – as well as national/international institutions – should be involved actively as guest lecturers in STCW-courses to get an element of higher academic education. We acknowledge that this is work in progress.
- Some students claim TalTech is not particularly supportive regarding internship. TalTech needs to clarify for the students how much they themselves have to work in order to secure onboard-training positions - and not only just hand over a list of companies. It is important that TalTech use its alumni and employers network to assist the students to get the first important appointment with a company.
- From an international viewpoint, student mobility should be encouraged by exchange agreements with foreign universities. We do acknowledge that the Navigation program has a relative good international mobility, but still that financial implications can make student mobility difficult for TalTech students, whilst international exchange students will face a language barrier. We also acknowledge and appreciate that TalTech will keep – and strengthen – the Estonian language in the education, although that English is the standard in international maritime business. We have well understood that Estonians have strong English language skills anyway.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher

education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Evidence and Analysis

The following lists of strengths and weaknesses reflect the assessment team conclusions studied through applicable standards. Bases for interviews and data collection were study programme self-assessment report, previous assessment report, reported improvement, latest revisions of study plans and site-visit around the simulator center and teaching facilities. Interviews offered two way communication between assessment team and students resulting in multiple findings with potential to enhance study programme suitability and performance.

Navigation study program teaching staff appears as a good combination of industry matured professionals and younger staff members. Navigation studies has strong external regulatory guidance through STCW (Standards of Training, Certification and Watchkeeping) via IMO (International Maritime Organization). Through STCW model courses, contents and scheduling are set presenting minimum requirements for studies in STCW courses. This sets limitations to freedom of planning and refreshing study plan through results of relevant research work. However, there are other means to develop teaching than through study plan, as multiple options for research and enhancement lie with the tools that are used today, such as navigation simulation. Navigation simulation is a research laboratory in itself, and it should be recognized as such. For many teachers, these approaches are novel and aging of the staff is inevitably a challenge for the faculty, as was reported already in the last assessment. Language remains as a challenge also in this study programme as many teachers struggle with English language, while English is the shipping industry language of choice. In international context, this presents the study programme with a major challenge. Navigation studies study programme teachers did not recognize significant improvement points even with the prevailing situation with dropouts. A feeling is left, that number of dropouts is normal and to be expected in this industry. Everyone does not fit for work at sea, is a widely heard phrase.

Strengths

- Experienced staff with subject specific knowledge. Teachers` former experience provides a lot of practical examples of how work on board is done. Teachers seem to have excellent working relationships with students suggesting possible lack of motivation does not emerge from the

way subjects are delivered from teachers to students. Teaching staff consists of both younger generation and aged professionals allowing different angles of approach pending on the study. Teachers feel being able to effect into study plans having gravity with their opinions.
- Navigation simulation and associated briefing-debriefing facilities are excellent for rehearsing navigational scenarios while some teaching staff has knowledge and experience of simulator pedagogy.

Areas of improvement and recommendations

- English language is shipping industry language of choice. For example in the simulator room there were instructions observed in Estonian language for GMDSS protocol. Acceptance of English language for the studies would not only streamline teaching process and use of available sources for example in thesis work, but also encourage students to seek job opportunities abroad. In this process it is important to pay attention to the English speaking/writing skills of the lecturers. Attention should be drawn in having younger teachers to handover the responsibilities from older staff in due time. The longer the handover the smoother the process is moving from tried and tested approaches into fresher perspectives.
- A pedagogical training or teaching portfolio should be required for new staff members for which permanent appointment requires that he/she makes a teaching portfolio that satisfies the pedagogical qualifications of TalTech.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Evidence and Analysis

The following lists of strengths and weaknesses reflect the assessment team conclusions studied through applicable standards. Bases for interviews and data

collection were study programme self-assessment report, previous assessment report, reported improvements and latest revisions of study plans. Interviews offered two way communication between assessment team and teachers resulting in multiple findings with potential to enhance study programme suitability and performance.

Navigation studies study programme students seem to have excellent working atmosphere although the unanimous feedback from the students was that forming a solid team amongst Estonian and Russian speakers seems to fail. All seven students and two alumnis interviewed were native Estonian speakers, none Russian speakers participated. The number of drop-outs of students from the study program is considerable. The underlying challenges for the high number of drop-outs and students that quit studies appears to be of motivational and lingual nature, however the students commented that the motivational issue is built differently from other training programmes. In the study plans, the STCW (Standards of Training, Certification and Watchkeeping) dictate the minimum operational levels for a vast majority of studies. Part of the studies is on board a vessel in the apprentice period, to form an integral part of navigational studies in different study levels. These apprentice periods have pre-determined credit points accredited, and as such they are fully part of the studies although students are not in school premises. In spite of this, TalTech takes very little responsibility for arranging suitable apprentice positions for students. All they get is a list of contacts, achieving an apprentice position is solely left to the students` responsibility. Many students fail in getting motivational apprentice positions onboard vessels that support their professional goals and dreams. The students interviewed introduced themselves as a clearly communicating group of motivated future professionals recognizing multiple valuable improvement points.

Strengths

- Students experience taught subjects relevant and well planned.
- Students value fluctuation between practical and theoretical studies although they report having too much time consumed with theory in relation to practice.
- Students generally have faith in their opportunities in achieving a steady job in an area of industry they desire.

Areas of improvement and recommendations

- Living expenses in Tallinn area force students to work for a living, while there are no governmental support mechanisms that would allow focusing to studies instead of having to work to finance studies.
- Majority of drop outs seem to be Russian native speakers, while they represent a significant part of the Estonian population as a whole.
- Although the students in interview form a solid team having thus lesser likelihood for members dropping out, all students interviewed were Estonian speakers, not Russian speakers. Out of the fourth year students,

only very few Russian speakers were left while majority had dropped out. The ones that were still studying were the ones that had committed to learn Estonian and socialize with Estonian speakers as a language group. There should be mechanisms that recognize this issue and genuinely focus in solving it. Having English language as a study language would somewhat ease this situation, however there political stands to maintain Estonian language as the language of choice for these studies. Language has very strong social effect and it is a strong part of determining one's identity within a group. This thinking should be drawn into decision making when future studies are planned.

- In general, the courses are planned according to the procedures set. However, some students experience that the result of the planning meets the students in diverse ways that make it more difficult for students to plan their detailed study plans. It is recommended to assess this and consult the students for specific issues.

1.3.4. Port and Shipping Management (Professional HE)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Evidence and Analysis

The study program development is led by the head of the study program, that use feedback from the program advisory committee (PAC), university decisions, teachers and students, as well as relevant international, domestic and inhouse research as basis for the study program development. The program and its

development comply with the Standards of Higher Education, TalTech's curriculum statue and Procedure for Study Program Management, as well as internal auditing (ISO) within the Maritime Institute.

The program advisory committee consist of representatives from employers, alumni, teachers and students. The current PAC has representatives from several ports, shipping company, alumni, as well as two teachers and one student. The Pac's primary role is well defined, however the PAC is low on student representatives to get a good dialogue on both ends of the study program, the employers and those studying. On the industry side, an idea could be to include a representative from the hinterland logistics side and even maybe a 'supply chain customer' like a representative from a production company exporting through a port and shipping system, to establish a better coverage of the supply chain system.

The stages of the study program development are precise and logical, establishing a good basis for a quality assured process towards achieving the program's intended learning outcomes.

As all other programs, the program has adapted to the subject unification process, resulting in that a number of courses have been altered and combined to grow into the 6 ECTS scheme, resulting in a number of courses with two lecturers. In general, a process that should be reviewed after a while to check for consistency in the combined courses.

The program have made use of general TalTech subjects that were aimed for use by multiple study programs and TalTech units. Interesting to see that the subject VAY1100 Higher mathematics and Operations Research, introduces operations research in the professional HE. A good choice for the port and shipping management context.

Both the share and number of elective subjects has been increased. Increasing the students freedom of choice and specialisation can be a good idea, but should be followed by rules and recommendations about different ways or structures through the study plan stating what type of end (professional position) the set of subjects chosen will lead you towards. This to avoid letting the students make combinations of subject choices that can lead them astray.

Increasing the 'ports and logistics module' with 50% to 12 ECTS can be seen as a good move, as reflected above in the PAC development into more supply chain stakeholders involved.

A challenging period for course responsibles and lecturers with so many changes. This can be understood and should be acknowledged in the course assessment process. In this situation, the program and course feed-back and assessment process should be made in direct interaction with the students, not (just) through formal computer-based feed-back systems. Student reference groups per course with two meetings with course responsible and teachers per semester is a good approach.

Comparison of the program with other similar programs at regional and international institutes has been made, and the positive experiences and

examples from the comparisons are sought to implement, in the scope they are available as options for this program under its present situation.

Strengths

- It is our understanding that the program advisory committee (PAC) has been a strength in the program development, also that the committee is dynamic and open to include new members if relevant.
- Study program development procedure in stages, with focus both on subjects in the program and content of the subjects are a good approach.
- The program has included general TalTech basic discipline courses (for instance in mathematics and IT) in its study plan. This is in accordance with the strategy after the Maritime Institute's merger with TalTech.
- Increased scope and alternatives of elective subjects are introduced and give the students an extended freedom of choice, but see also 'recommendations' below.
- Increased focus on logistics subjects within the study plan. Interesting to see operations research as part of VAY1100.
- Acknowledged results from comparison with similar studies internationally, and how and to what extent the positive examples from these could be introduced in this program, show – for the program development, a constructive approach to dealing with

Areas of improvement and recommendations

- To keep-up the voice of the students in the committee, to have more direct and responsible student interaction in the program development, it is important to retain two student representatives in the program advisory committee (PAC).
- The program advisory committee (PAC) should strive to include two other stakeholders from the industry side; a hinterland logistics operator or similar and a representative of a company that imports or exports products through a supply/distribution chain involving ports and shipping.
- The program should continue to search for course options with other TalTech unites that can support the program's study plan, so that the program can free more of its resources to focus on improvement of specific core program subjects, and to develop new program specific subjects.
- The program should develop study guide material that explains the best choice and use of (a set of) elective subjects in specialising a student's study plan towards the student's own professional objectives.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Evidence and Analysis

In terms of resources, the classrooms available for teaching are very good. All possible equipment (as regards the state-of-the-art) is available. In addition, software is available to be used for teaching as well. If software is purchased additional funds are needed for training, upgrading software and employees for maintenance. The study literature is up to date, however, the language issue is a point of attention here as teaching staff is requested to translate English material in English (and sometimes Russian?). Modern teaching materials are available, however, for some teachers it is hard to master the new technologies, or the technologies are just too complicated or teachers prefer other means of communication (such as more traditional ones which are also valued by students).

Strengths

- Resources provided for teaching and organising conferences are very good.

Areas of improvement and recommendations

- If a problem is signalled, quite often more technologies, tools and software are quoted to be the solution but this is not always the case. The current status appears to be already quite good. We recommend that a focus is that ask what can be realised with the current technologies, to see how the current technology and tools can best possible support achievement of the intended learning outcomes of the program. If a gap is identified between what the currently available technology and tools can and cannot support in achievement of intended learning outcomes, then one should assess the needs for new technology or tools.
- A follow up to the point made above, and also related to the Navigation program – see further comment there: The usage of the technologies, tools and software is also a point of attention. What is the utilization rate of the respective ones? If we have the most modern equipment but it is just used 10 days a year and we pay large fees for updates are these investments justified.
- More technologies are not always good, as it requires focus and time that could be used for other, more long-term requirements. The companies

several times mentioned that basic knowledge must be good and the basics of technologies, tools and methods are very important. The most modern technologies will be learned once hired by the companies and are thus not needed for TalTech (or the Academy or the Programme)

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- More money to increase the inputs is often quoted, but what about the outputs. A justified question is also; given the inputs the Academy has (of the Programme) what can be realised in terms of outputs?
- As having a wide range of different tools available (simulators, labs, soft wares etc) then it is recommended to work out a continuity plan how to secure future development of the tools, reduce the risk of updates and take care of sustainability on teaching staff and keep the know-how in house.
- Moodle as a Modern learning platform, course management system (CMS) usage opportunities needs to be fully utilized in order to improve study process towards students and make daily teaching life more effective also for teaching staff. TalTech has created even central support for that to train the usage skills and as well handle technical issues.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.
- ✓

Evidence and Analysis

The scope of elective subjects are increased in the program, and also the number of elective subjects to choose among. This is positive for a program's options to support each student's individual and social development.

The scope of electives and the new courses introduced into the program's study plan from TalTech 'generic' courses contributes to the flexibility of teaching and

learning, towards better coverage of the form of study and the potential for achieving the program's and each students' intended learning outcomes.

Based on resources form both TalTech and the Maritime Institute there is a good potential for web supported e-learning within the program. The good lecturer pedagogical development programs can ensure positive development in pedagogical qualifications among the teaching staff.

Port and shipping management study programme students seem to have excellent working atmosphere although unanimous stand from students was that there are significant differences in ways of teaching between teachers. Some use e-learning tools such as Moodle only for sharing study material, some use modern tools as concrete part of delivery of studies.

Research papers are used in the learning process, and these are taught and supervised individually. A good process as a research paper requires focus to contribute in a learning process.

A clear and consistent (new) procedure for thesis work is introduced and presented in the self-evaluation report. As a new procedure we can expect some issues in a start-up period, but there seems to be a constructive focus to make the thesis process work well.

The theoretical and practical sides of the program should balance, and the practical side shall also cover practical training in companies. Resources both at the Maritime Academy level, as well as on the program level shall help students to get contracts for practical training, although the responsibility lies with the students. Such loose arrangements between an academic institution and organisations that can provide practice are challenging.

Discipline related software tools are being introduced in different subjects, and also supported by the theory and methods behind them. As described in the SER this provides the students with the skills of using a good (software) toolbox.

Strengths

- The options provided by the extended scope and set of elective subjects enhancing the flexibility and individual adaptation to each student's intended learning outcome.
- The method oriented (software) tools introduced in the subjects are a good way to develop skills for using tools, and bridging the theoretical and practical sides of the study.
- Awareness of digital tools/app's as e-learning tools are actively used in some courses. This should be shared among all courses provided by the Maritime Academy in the program.
- Good awareness of fraud, and the open dialogue with the students about work and research ethics and the consequences of fraud.

Areas of improvement and recommendations

- Given all the changes that have taken place in the study program, and the effect this have had on the teaching and learning situation, a special focus should be taken towards this. This is both related to the effect of changes in courses and study plan, and the development of the teachers in coping with the situation, and meeting the pedagogical requirements of such a program. We suggest to make the available TalTech training in pedagogical and e-learning tools mandatory for all lecturers in a situation with so much changes. This should contribute to more unified approaches in teaching and learning.
- Guidance for the students in how to best chose among the elective subjects to best achieve their intended learning outcome.
- The Maritime Academy should be proactive in establishing an overview of available student places for practical training, so that the student will have an offer, but still that the student must seek, apply and present herself or himself to learn about job-seeking activities as part of the practical training. For the program the importance is to be known as a program that are able to provide help in achieving the student's theoretical an practical balance.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Evidence and Analysis

The following lists of strengths and weaknesses reflect the assessment team conclusions studied through applicable standards. Bases for interviews and data

collection were study programme self-assessment report, previous assessment report, reported improvement, latest revisions of study plans and tour around the simulator center and teaching facilities. Interviews offered two way communication between assessment team and students resulting in multiple findings with potential to enhance study programme suitability and performance.

Port and shipping management study programme teaching staff appears as a good combination of academic and industry matured staff members. Port and shipping management studies have a strong connection to navigation studies and logistics within maritime academy, although collaboration between these study programmes is left to minimum. The merger with TalTech did not bring significant change to collaboration levels, but use of resources altered as after the merger there is less contact lessons (referred as "auditory lessons"). In distance learning and e-learning educational technologist has provided significant assistance allowing teachers to focus on their core tasks. Study plans are carefully prepared, but industry representatives seem to share a view of the students having too theoretical study programme, where practical problem skills are not enough highlighted. This problem solving discussion emerged multiple times in different discussions during assessment interviews and discussions. A carefully planned cooperation should be established between industry stakeholders and educators to form holistic understanding of industry needs as well as industry responsibility to participate in raising future professionals. No student is ready after graduation. Employees and employers ideally form a relationship where responsibility for professional growth in shared. Education facilitates this by casting a foundation to build on.

Strengths

- Excellent connection to industry stakeholders among throughout the field of operation.
- E-learning facilities and tools are used widely and they are generally well known by the teachers in comparison to for example maritime studies or navigation study programmes. This allows resource planning for teachers and also eases the learning process related logistics for students when some of the studies can be done as distance learning.

Areas of improvement and recommendations

- The program should strive for a better balance between theoretical and practical skills. Students are too theoretically taught and practical skills are not highlighted enough. This leads into lack of practical problem-solving skills leaving too much responsibility for the industry for carving students into useful professionals. We suggest to address this, and discuss this with the management of two of the other SPs in the SPG: *Navigation* and *Waterways Safety Management*, as they have both experience from developing practical skills, but also have showed how to strengthen the

use of the theoretical side to support the practical skills – the opposite problem of this.
- Collaboration in studies between other related study programmes should be enhanced. Courses should be taught across the board while presently there seem to be dedicated teachers that remain with their study programmes.
- TalTech connections and channels to collaboration in teaching are not utilized in full. This appears with varying gravity in all study programmes. This is a quite general recommendation, but is based upon our understanding after the SER and the site-visit. We have seen a positive development in this respect, but we believe that there is room for more. This can contribute to a more focused Maritime Institute that will have more resources to focus and improve their main areas and strengths, and with better insight into and use of other TalTech resources to support the achievement of the intended learning outcomes of their SPs.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Evidence and Analysis

Again, all students interviewed were native Estonian speakers, none Russian speakers participated. All courses are delivered in Estonian language, while the origin of the study material is presented with strong connection to research. Although students have good communication with teachers, feedback mechanism is taken very lightly by students, while significant gravity is placed on survey results when determining quality of teaching. In this study programme number of dropouts is considerable. Difficulties in thesis writing seem to be connected to that, as many students reported having difficulties in acknowledging the importance of thesis efforts, this even though writing thesis begins in very early stages of studies. This suggests stronger guidance and supervision to thesis as cutting through phenomena amongst all study programmes. Motivational issues reflect this dividing in challenges during studies and in challenges to finish thesis and finally graduate. Studies are generally seen demanding to limit of not having enough competent students that possess the potential to succeed in study programme. Students are surrounded by external attractions as so many other attempts, including employment contract before graduation, are present.

Students interviewed introduced themselves as clearly communicating group of motivated future professionals recognizing multiple valuable improvement points.

Strengths

- Excellent future prospects for employment in various industry areas is recognized by students. Studies aim to have holistic view over the field of stakeholders approaching studied subjects from multiple angles. Research is strongly present in studies.

Areas of improvement and recommendations

- Dropping out of studies remains a core issue for this study programme as well. Although students in interview form a solid team having thus lesser likelihood for members dropping out, all students interviewed were Estonian speakers, not Russian speakers. As we understood form the interviews, that out of fourth year students there were only very few Russian speakers left while majority had dropped out. The ones that were still studying were the ones that had committed to learn Estonian and socialize with Estonian speakers as a language group. There should be mechanisms that recognize this issue and genuinely focus in solving it. Having English language as a study language would somewhat ease this situation, however there political stands to maintain Estonian language as the language of choice for these studies. Language has very strong social effect and it is a strong part of determining one's identity within a group. This thinking should be drawn into decision making when future studies are planned.
- The resuts of research work should be communicated and published in relevant channels. This do also relate to the language barrier, where transparent research should focus in collaborating with fellow researchers and institutions with associated peer review mechanisms. This is somewhat impossible when teaching and research, including thesis work, is conducted in the Estonian language, while research publishing is internationally conducted in English.
- All and all there seem to be thresholds beyond university control that reduce possibilities in broadening international collaboration between researchers and institutions.

1.3.5. Waterways Safety Management (Professional HE)

Study programme and study programme development

Standards

- ✓ The launch or development of the study programme is based on the Standard of Higher Education and other legislation, development plans, analyses (including labour market and feasibility analyses), and professional standards; and the best quality is being sought.
- ✓ The structure and content of modules and courses in a study programme support achievement of the objectives and designed learning outcomes of the study programme.
- ✓ Different parts of the study programme form a coherent whole.
- ✓ The study programme includes practical training, the content and scope of which are based on the planned learning outcomes of the study programme.
- ✓ The study programme development takes into account feedback from students, employers, alumni and other stakeholders.

Evidence and Analysis

The Waterway Safety Management study program educates professional candidates that among other could meet the requirements from the International Hydrographic Organization for *Standards of Competence for Category "A" Hydrographic Surveyors* and/or *Standards of Competence for Category "B" Hydrographic Surveyors*. The new edition of these standards were published in 2018 and 2017 respectively and are a benchmark for the development of the study program.

The development of the Waterways Safety Management (WSM) program meets the Standard of Higher Education, and strongly support the vision of the Estonian Maritime Academy (the Maritime Institute) of becoming an internationally recognised centre of competence in the maritime field. The WSM program with its intention, plan and work towards becoming a certified educational institution according to the 'Standards of Competence for Category "B" Hydrographic Surveyors' and also towards 'Standards of Competence for Category "A" Hydrographic Surveyors' is a strong candidate for contributing to realising this vision for the Maritime Institute. The WSM program further strongly support the mission of the Maritime Institute by being a program that educates top specialist for its maritime field of competence – for example as their candidates being recruited by both national and international leading organisations, contribute to research and development activities were both internal faculty and faculty from other Faculties and Departments at TalTech conduct research and development work together with the students of the WSM program, and through their research and development work also provide services to the maritime sector.

The structure and content of modules and courses in the WSM program support the achievement of the objectives and designed learning outcomes of the study program, as well as forming a coherent whole. This is made even better through the revision since the previous assessment of the study program, also better seeking to fulfil the Maritime Institute's vision and mission. This is well presented in the study plan of the self-evaluation report and the course examples provided, the interviews made during the study tour. It is further strengthened by the objective of the development plan of the WSM program in planning and working

to submit applications to qualify as a provider of educational programs for Standards of Competence for Category "B" (and Category "A") Hydrographic Surveyors given by the International Hydrographic Organization (IHO). Achieving this will both be an international recognition of the WSM program, as well as strong contribution to the vision and development plan for the Maritime Institute and the TalTech Transport Study Program Group. It is the opinion of the assessment group that the Maritime Institute should in their best way enable support for the WSM program in best securing a successful outcome of their Category "B" or "A" application to the IHO.

The WSM program includes practical training and the program has received both equipment and other support from industry in being able to provide as good as possible practical training. This is well described in the self-evaluation report, and also explained and supported by the faculty, industry stakeholders and students in the study tour interviews.

The WSM program management has shown a very strong ability to bring in and constructively use feedback in development of the study program. In addition the head of the study program has proactively sought feedback from other international academic institutions with similar educational programs, to further raise the quality level of the study program, also towards international accreditation of the study program.

The development of the self-evaluation report, was carried out by the head of the study program, the study director of the Maritime Institute TalTech, a lecturer in the study program, and two students – from two different study groups. It is our understanding that the head of the WMS study program is very proactively engaged in the development of the study program, and takes the international development of the discipline, strategies of the Maritime Institute TalTech, research opportunities, and international study accreditation opportunities into account in the development of the study programs.

The changes introduced into the WSM study program since the last revision, where more study credits (ECTS) are dedicated to more fundamental content, and the developments towards category "B" and/or "A" accreditation by IHO shows that the program remains both current and consistent with the needs and development of the society and market – also the international market and training and competence development opportunities for its candidates, as well as keeping the content and objectives of the program in accordance with each other.

The coherence of the WSM study program is ensured by the ongoing process for accreditation of the study program by IHO – the International Hydrographic Organization.

Practical training is an important part of the WSM study program. Both to know to the type of equipment being used in practice, the type of and process of the practical studies of the discipline, as well as to get to know and get used to the maritime working context of the discipline. Dependent on the student's choice of focus, the maritime working context of the discipline, working and conducting studies onboard vessels is an important test of the candidates' preparedness for

working in the discipline. The candidates of the program, should be introduced to such maritime practical training early in their studies.

The feedback from all stakeholders – students, alumni, employers and academic staff, was unanimous and positive about the effort and development of the study program. This further points to the importance of securing a successful outcome of the Category "B"/"A" accreditation application to IHO of the study program.

The study program has compared itself to other similar study program internationally, and most importantly is the collaboration the study program management now is establishing with the University of Southern Mississippi in their plan and actions towards applying for Category "B"/"A" accreditation by the IHO. Having a clear and well grounded plan for such accreditation application documents the quality level and relevance of the study program.

Based upon the use of Estonian as primary language of the study program, the opportunities for foreign students to participate in the study program is demanding, as also reflected in the drop-out rate among students with Russian as their mother tongue. However, several courses of the program have been translated to English to improve the opportunity for international students to participate and successfully complete the study.

Development of research and development activities were shown through interesting collaboration between faculty and students of the WSM program and faculty from other faculties at TalTech. This can be considered an important contribution to the Maritime Institute's mission of becoming more research focused, and is an example of state-of-art practice in both research organisation and student research opportunities - a practice with similarities to the Massachusetts Institute of Technology's (MIT's) UROP program where undergraduate students are given opportunity to participate and contribute in ongoing research projects (UROP, Undergraduate Research Opportunity Project).

Strengths

- The action plan and collaborations established to pursue a category "B" and/or "A" accreditation of the study program by the International Hydrographic Organization.
- More fundamental courses to develop a strong platform for development of discipline knowledge and skills.
- Use of digital tools and IT knowledge to enable both discipline skills as well as becoming able to develop own discipline related tools through development of computer programs (software) where discipline theory and methods are programmed into software to support analyses of the discipline.
- Practical training with state-of-art equipment.

Areas of improvement and recommendations

- Support the action plan and collaborations for enhanced likelihood of success for the accreditation application to the IHO.

Resources

Standards

- ✓ Resources (teaching and learning environments, teaching materials, teaching aids and equipment, premises, financial resources) support the achievement of objectives in the study programme.
- ✓ There is a sufficient supply of textbooks and other teaching aids and they are available.
- ✓ Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).
- ✓ Resource development is sustainable.

Evidence and Analysis

- Software for processing hydrographic data is available. Both inhouse for basic training and access to state-of-art equipment for practical training on hydrography through collaboration with industrial partner (as of 2019) - one-month access for students.
- The teaching staff and other supporting staff have PCs and/or laptops with up-to-date software.
- The merger with TalTech has resulted in access to professional equipment through other departments at TalTech, as well as research collaboration with academic staff and resources at other departments at TalTech. The benefit of this has been developed and utilised in the last period.
- The program are as all under limited financial budgets, hence the purchase of textbooks are only available within given budget limits. This requires innovation with respect to alternative learning material access. This is also an important issue with respect to the rather low numbers of students in the program. With more students this issue will be leveraged.
- In the last period, the alumni as become a more active resource for improving the study and giving access to equipment and vessel resources. This has had a real positive contribution for basis for the study program development.
- The development of the study program has an important opportunity in the availability of international requirements and standards for the discipline study based upon sources and accreditation requirements from professional organization(s) of the discipline. These can be used as source for the study program development, and for the resources required to achieve such accreditation.
- The study information system SIS2 enable professional interaction on study management and progress follow-up between faculty and students.
- Although an important and valuable resource contribution, the dependency on external partners should be regarded as a main vulnerability of study program development. This means that the study

program's dependence of resource(s) that are made available externally make the study plan vulnerable. One can say that this vulnerability is mitigated through the WSM study program's focus on achieving accreditation according the IHOs category "B" and "A". An IHO accreditation will become an important resource in itself, as achieving the accreditation would secure a quality assurance of the level of the study program that will quality assure the SP as an educator of internationally high-standard candidates for work domestically, regionally and internationally in a sought-after profession.

Strengths

- Development of collaboration with external partners to achieve access to state-of-the art training equipment and training facilities for the students.
- Finding and developing collaboration with other departments within TalTech beyond the Transportation SPG for access to courses, teaching staff, equipment and research problems and projects for the students.
- An active Program Advisory Committee and the relationships to their Alumni.
- A very proactive head of the study program, with a strategic focus for developing the program in a discipline standard assured way, and also increasing the academic content of research in the program.

Areas of improvement and recommendations

- Given the importance of practical training in this field, it needs to be taken care that resources for on-board training will be available continuously and as well practical simulators. But the decision of study strategy should define it clearly, where and what tools are required. Collaboration with Navigation SP is important.
- Moodle as a Modern learning platform, course management system (CMS) usage opportunities needs to be fully utilized in order to improve the study process towards students and make daily teaching life more effective also for teaching staff. TalTech has created central support to train the Moodle usage skills as well as to handle technical issues. The use of this is especially important now in the period just after the merger, to close a possible procedure-use gap between former TalTech and the Maritime Institute, hence a better overview of how this is being used should be created and monitored.

Teaching and learning

Standards

- ✓ The process of teaching and learning supports learners' individual and social development.
- ✓ The process of teaching and learning is flexible, takes into account the specifics of the form of study and facilitates the achievement of planned learning outcomes.
- ✓ Teaching methods and tools used in teaching are modern, effective and support the development of digital culture.
- ✓ Practical and theoretical studies are interconnected.
- ✓ The organisation and the content of practical training support achievement of planned learning outcomes and meet the needs of the stakeholders.
- ✓ The process of teaching and learning supports learning mobility.
- ✓ Assessment of learning outcomes is appropriate, transparent and objective, and supports the development of learners.

Evidence and Analysis

The study plan, courses and practical training give good support both to the learner's development of individual knowledge, competence and skills, as well as their social development to act as part of an international professional group and the needs of the Estonian society.

The process of teaching and learning seeks to comply with international standards of the discipline, hence securing the achievement of the planned learning outcomes for the candidates. The process of teaching and learning is also flexible, enabling candidates to continue their study after they for diverse reasons had to take a pause during their study. This was explained and supported by the students in the interviews.

The teaching methods and tools used are based on a mix of good equipment and very good software tools provided by industrial partners. Both also securing the candidates digital literacy. In addition, the candidates have access to very good digital study support tools that support their development of digital literacy. Introduction of programming exercises focused on digital enabling of discipline methods further improve the candidates digital and discipline skills.

The interconnection of the theoretical and practical elements of the study program is very well developed, both as a requirement of the professional discipline, and as a focused development objective of the study program management. This was supported by the interviews of the employer side and the students.

The organisation and content of the practical training is developed and executed in close collaboration with the stakeholders, both to get access to state-of-the art equipment and tools and hence to better secure the fulfilment of their needs. This was explained both in the self-evaluation report and supported by the interviews of the stakeholders. The scope of practical training was also considerably increased since the previous assessment.

The format of the WSM study program, with a strong basis in general and core studies, combined with a good scope of strong special studies modules, and

where the theoretical knowledge is set into practice in practical training, where both individual knowledge and skills as well as team collaboration is important, and the use of state-of-art technological equipment and digital tools are required, give a strong contribution to the student's general competencies.

The teaching methods, learning environments and learning aids are innovative in the respect that it is our understanding that the best fit and use of these for the purpose of developing discipline candidates are of high quality. We see that the level of innovation is purpose oriented for the improvement of the study program, and not innovative for the sole purpose of innovation. It is our impression that innovative developments in the study program is a process that is focused to sustain a long-term development of a quality study program, through new, state-of-art theory and practice combinations, where new technology and tools are available to the students.

The teaching staff is using and trained in using the digital tools and e-learning options provided by TalTech. The teaching staff also commented about the availability of relevant training modules through TalTech that they could and had used to raise their competence in making use of the digital learning tools.

A specific practical training module ensures that theory and practice is well connected in teaching and learning. This is as a basis founded in the development of the study program and the program's collaboration with industry and organizations on the employer side.

The students gave very good feedback on the practical training, both the scope and content of the practical training and the insight into the practical work of the discipline given early in the study through the course VMV0550 Introduction to the specialization area.

Student involvement in research and development has been provided by the head of study program through cross faculty collaboration within TalTech.

From the description in the course examples in the self-evaluation report, we see that independent work is part of several courses. We can see that the independent work in many cases are related to follow-up and reflection on practical training and shall be documented in a report and also presented in public seminars.

As part of the study program revision within TalTech, all courses are changed to 3, 6 or 9 ECTS credit points. Assuring a correct workload according to the ECTS credits is made per course based upon number of hours per week for lecturing, practical training and assignments. This is in accordance with common practice at other academic institutions. The students gave no comments on uneven or too large workloads compared to ECTS credits.

The course examples provided in the self-evaluation report give a good insight into the assessment methods used in the courses. The assessment methods are well described and the grading according to performance is also described to an expedient level of precision, hence should be a good basis for an objective and open assessment of performance.

Strengths

- The use of practical training with access to state-of-art equipment. This is both a requirement, as well as a state-of-art development of the study program based on the program management's strong development skills and efforts.
- The up-graded use of ICT in courses provided in cooperation with the IT faculty of TalTech, and the enhanced scope of the course in data analysis where the students are introduced to discipline relevant programming in R. In addition, that the programming exercises are used to bridge understanding about the interfaces within the discipline is a state-of-art example of integrated use of digital competence development as part of discipline education and discipline knowledge enhancement.
- Direct interaction between faculty and students - due to low number of students.
- We agree to the self-assessment comment that a key strength of the study program is the possibility to apply theoretical knowledge in the real working environment'. With the enhanced scope of digital training this is further strengthened as well as given a practical competence in use and development of digital tools of and for the discipline.
- Although the discipline and the study is of an applied character, the program management's ability to integrate research tasks for the students together with faculty from other TalTech departments is a state-of-art development both for the study, as well as for the the Maritime Institute / TalTech collaboration development.

Areas of improvement and recommendations

- As presented in the self-evaluation report and as experienced during the site visit, the study program has been in strong and positive development since the last assessment. Our recommendation is to enable the program management to further follow and realize their plan for the teaching and learning activities of the program where achievement of a category "B" or "A" accreditation by the IHO will become a quality assurance mechanism and standard of the quality of the program status and development when it comes to state-of-art teaching and learning for the discipline.
- How can the teaching and learning processes be kept up at the same good level if the number of students fulfilling the study increases, i.e. the number of drop-outs are reduced? This should be addressed as part of the preparation for the IHO accreditation.
- Continue the development of use of the student information system solutions to support the study management, and explore how further e-learning opportunities can benefit the study program, and also contribute through digital/virtual means to reduce the geographical distance between

the the Maritime Institute campus and the main TalTech campus. Hence, contributing to ease the students access to courses and learning material through TalTech.

Teaching staff

Standards

- ✓ There is teaching staff with adequate qualifications to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.
- ✓ Overall student assessment on teaching skills of the teaching staff is positive.
- ✓ The teaching staff collaborate in the fields of teaching and research within the higher education institution and with partners outside of the higher education institution (practitioners in their fields, employers, and staff members at other Estonian or foreign higher education institutions).
- ✓ Recognised foreign and visiting members of the teaching staff and practitioners participate in teaching the study programme.
- ✓ The teaching staff is routinely engaged in professional and teaching-skills development.
- ✓ Assessment of the work by members of the teaching staff (including staff evaluation) takes into account the quality of their teaching as well as of their research, development and creative work, including development of their teaching skills, and their international mobility.

Evidence and Analysis

Based upon the self-assessment report - report and appendices, the teaching staff seem to meet the standard's requirement for formal background of the teaching staff. As seen from the list of teaching staff and the courses they teach as presented in Part D/Appendix 5, the degree of formal researcher education (PhD level) is high and many courses are given by and lectured by TalTech staff from other Faculties/Departments.

The Programme has a motivated and dedicated staff though quite diverse (full prof 100% research, contracted lecturer, part-time lecturer, and tenured staff). The merger between TalTech and the Maritime Academy is overall seen as an improvement by most employees. Especially the resources have seen a large improvement. The name of the Programme is not very clear and not attractive to students; suggested alternatives are *Waterways Management* or *Hydrology and Cartography*.

Teachers have limited available time to do research and more research time is desired by the teachers with a tenured status. Sometimes, teachers do give courses two times but from a different (not further specified) angle. We experienced that the teachers had a positive experience of the teaching improvement courses provided by TalTech, but that not teachers took the

courses offered to improve teaching due to a lack of time. The prerequisites for staff between TalTech and the Maritime Academy are different following the discussions with the staff. More research is wished for the Academy but this research is not in the DNA of all of teaching staff of the Institute. Overall, the career development opportunities seem to be quite diverse ranging from I am ok and too old, via it takes place at TalTech, to this is my level but I would like to grow more. However, we heard examples of strong research engagement by some teaching staff, and their state-of-art prospect of using student as part of the research team with specific research tasks.

The students are very motivated but at first not always very clear what to expect from the Programme and its curriculum. The students are very interested in learning tools.

Moodle is not always used because the courses also work without it. Starting a course in MOODLE requires much invested time in preparing. Most teachers do not have this time available. Furthermore, Part-time and hired teachers do not have any incentive to use MOODLE. The support to use the system is perceived as good by the teachers.

Strengths

- Teaching staff from different backgrounds and qualified for what they are expected to teach
- Appointment of the full research professor who has quite some refreshing ideas
- The integration of teaching staff from other Faculty/Department at TalTech and their approach to research and research process including the use of the study program students should be regarded as state-of-art practice.

Areas of improvement and recommendations

- Most of the teachers work on a part-time basis which does not lead to a very strong relationship with the employer. Also the differences between teachers (contract, teacher, Associate Prof (100% teaching), and research prof (100 research) do no contribute to team coherence.
- Not enough research staff is involved in R&D activities. This depends on the qualifications and possibilities. First, teachers are not supposed to be involved in research. The tenured staff would like to be involved more in research but is overloaded with teaching. The research prof is 100% research but would be willing to be engaged in teaching. In order to free more research capacity, the teaching load of the tenured staff should be reduced. More research capabilities should be employed or the ambitions in terms of research should be lowered if the current staff composition is regarded right.

- Resources should not be used to develop more learning material in Estonian. The profession of the discipline is international and new knowledge in the discipline will be available through international sources. Also the drop-out rate due to language problems of students with Russian as their mother tongue language will probably not be improved by more learning material in Estonian.

Students

Standards

- ✓ Student places are filled with motivated and capable students.
- ✓ The dropout rate is low; the proportion of students graduating within the standard period of study is large.
- ✓ Students are motivated to learn and their satisfaction with the content, form and methods of their studies is high.
- ✓ As part of their studies, students attend other Estonian and/or foreign higher education institutions as visiting or international students.
- ✓ Employment rate of alumni is high.
- ✓ Alumni and their employers are pleased with their professional preparation and social competencies.

Evidence and Analysis

Admission of students to the program follows TalTech's threshold system and year-round admission, but with an interview to check understanding of and interest for the discipline of the study program. Although the WSM program is a study of practical character, it relies on foundational basis of mathematics and physics courses that can be a challenge for many students and is one explanation for the high drop-out rate early in the study.

The high level of dropout rate is still an important issue although there have been improvements since the last assessment – including adding interviews to the admission process. There still remains a low level of understanding with the proposed students what the study program is about, what it requires and what are the outcomes for future career prospects. Language issue also remains an issue, due to the fact that the study program is taught in Estonian but there are admitted a lot of Russian speaking students who do not manage to follow through the program. The effect of the admission interview has to be awaited in the statistics. All of the students agreed on the aspect that everybody gets admitted. 3,5 GPA level does not show actual knowledge. As this is a novelty in the program, the effect is still to be shown.

Although the dropout rate is still high the students currently going through the study program are highly motivated and very interested in getting the best education and preparation for the working field. That shows in their interest of

being included into research and development, and also with their proposal to include more IT and programming courses to the program. Students brought out that personal approach from teachers is also an asset and that aspect was very much appreciated.

Students have an understanding about internship requirements and realise that finding the internship place for themselves is a part of the learning process. Confirmed in site-visit from students.

A lot of effort has been put into teaching basics for the students. Students agreed that although the new technology is something that they have to learn and work with in the future, the basic knowledge is more important. It gives a great starting ground and opportunity to learn and know how the technology is working and what is behind every system. Integrating IT and programming into the use of the basic discipline knowledge and methods is regarded as important both for digital development and strengthening discipline learning outcome.

The employment rate has remained high as in the last four years 75% of the program alumni have started prospective professional careers.

Although the students and alumni have prepositions how to improve the study program they are quite pleased with the education and practical preparation they are getting. Employers agree that the students are properly prepared to start their working careers. But from both students/alumni and employers view there should be more practice. Students focusing on a professional life at sea need to improve their "seaskills" and that can only be done at sea, not in the classroom.

We see a positive development for increased student mobility, both for outgoing and incoming students. An IHO accreditation can be expected to further improve this.

Strengths

- The students continuing in the program are highly motivated.
- Program alumni are getting the needed preparation from university and WSM program for doing well in the work field.
- Personal approach from lecturers.
- The balance between theoretical and practical issues in the study secure that the students learn the basics to know how systems work, and are able to train by use of in-house basic discipline tools.

Areas of improvement and recommendations

- To reduce the dropout rate, more focus should be put into explaining students about future career options through alumni or from examples from the people working in the field.
- Research and development field is something that the students are already interested in their bachelors and that enthusiasm could be used earlier on to include them in different projects.
- More attention should be paid to the admission process. There is room for developing a system that is well thought through and that is helpful in selecting out the best students during the admission process. The students stated that it is very easy to get admitted. Suggestion would be to create a test for mathematics, chemistry and physics. It would give the applicants some idea what is coming their way and offers the university a better overview of the students. Based upon the assessment of the level in mathematics and physics in the admitted student group, prepare and run a mandatory levelling program in mathematics and physics for students with such needs. Effect of already made changes should also be evaluated.
- Encouragement could be given to the students in order to do more practise at sea and internationally.

- The high drop-out rate of Russian speaking students should be assessed. We understand that this issue go beyond the language issue, and this should be assessed due to the number of students and impact on the drop-out rate of the program.

Annex to the Assessment Report: Comments to self-evaluation report

Below we have commented upon the conclusions in the summary table 'aggregate analysis of the study programme' and the action-plan in the self-evaluation report. All our comments are based upon our insight gained through the self-evaluation report and the site-visit leading to our recommendations for the study program.

Logistics (MA)

Table. Comments to the 'Aggregate analysis of the study programme' from the self-evaluation report of the Logistics SP.

Assessment area	**Strengths**	**Application of strengths**	**Areas for improvement**	**Activities for eliminating weaknesses**
Study programme	Wide possibilities to develop a specialized Master level programmes of Logistics with a wide set of supportive subjects from curricula of social, technical and ICT fields.	Analysis of interrelationship between different subjects to develop well-balanced interdisciplinary study programmes on a Master level (Bachelor level or the main speciality in the near future).	Binding the content of the Masters' study programme with the position in the structure of the university (Department of Mechanical and Industrial Engineering) and focusing further on Logistics' Engineering.	Preparing the new version of Logistics Masters' study programme with subject taught in English in the Logistics Master programme.
Comment	*The current version of the Logistics MA SP gives a general business logistics (SCM) curriculum - with a mobility engineering introduction, or a specific mobility engineering specialisation. If a more focused curricula towards social/technical/ICT and engineering/ICT/quantitative economics is planned, this would change the general nature of the student group that we see today, towards a more quantitatively, engineering/ICT oriented stduent body. This would also require a change in the logistics/SCM ba study, as commented above. The result should be more specialised logistics engineer and analysts with strong ICT capabilities - which are demanded by the industry, but you could (would) loose out on the business logistics generalists. We suggest that you try to develop a program and curricula that can meet both ends, and where a more engineering/ICT/quantitative*			*There is a rich availability of good learning material for logistics and related methods (especially operations research) in English - this should be utilised to the best extent possible.*

	economics logistics BA study is re-developed to support the ICT/quantitative analytical parallel of a revised program.			
Re-sources	Being part of TalTech supports the availability of the university's infrastructure and human resources of different faculties (university level international study programs, ICT tools and programmes).	More targeted and knowledgeable use of TalTech resources, especially to improve the Logistics Engineering component in the Logistics programme.	The development of TalTech Logistics lab "LogInn".	Opening "LogInn" and actively integrate its opportunities into the teaching process and collaboration opportunities with companies.
Comment	*We are convinced that you have a large potential here. It has been difficult for us to research the relevant study plans and courses in other Faculties and Departments as the descriptions are in Estonian.*		*Develop the LogInn lab so that it becomes a lab where industrial problems meet (a) good problem solving process(es), relevant tools (software and skills to use them - requires curricula development, and hence development of competent candidates.*	
Teaching and learning	Good and working system of organising the writing of graduation thesis reflected in a relatively high percentage of graduates during the nominal length of the study process.	Closer cooperation with companies to increase the number of projects with the companies including practice, which is a starting point for course work and thesis with supervision by the Department (study programme) and by a representative of the company.	Additional full-time faculty staff with good R&D record. Deeper and more regular international exchange of lecturers.	Hiring through international advertising good specialists (TalTech level procedure).
Comment	*You should have the best of opportunities in achieving a successful outcome of this. The use and role of the program advisory board should be central in this.*		*This is always sought after, but can be hard to achieve. A best starting point is to achieve an interesting study with high level candidates. Can collaboration with other faculties/departments be a way to go - se above?* *Do also check how the WSM program has brought international faculty staff from*	

			other Faculty/Department into the program.	
Teaching staff	Alumni of the study programme form a remarkable network of guest lecturers (practitioners).	Partially integrating alumni into the teaching process with the emphasis on practice-based teaching and focusing on educating new academic members.	Poor cooperation with companies and limited knowledge of trends and projects concerning studies where students can be involved.	Closer cooperation with companies (alumni) to tight the bond and increase the number of both-ways collaboration projects with the companies (including training and involvement of practitioners as lecturers).
Comment	*We see that you have a really good opportunity here. But, it requires that you establish a formalism around this. The program advisory committee should be central in this.* *Which formal status can the alumni in the education process achieve, i.e. what is the benefit for the alumni going into such positions making them formally new academic members?*		*The use of social media described shows that active communication channels already exists, but are maybe not linked to formal study processes?* *A logistics 'think tank' could be established between the SP and companies.* *Part of the think-tank should be presentation of cases and problems by the companies, presentation of cases and studies published in national and international literature by faculty and students, and presentation of case work by students.*	
Students	Good position of logistics and supply chain management sector in Estonian economy and high demand for graduates of the Department	Improving and developing TalTech Logistics social media accounts in order to stay in the picture and be in contact with the present, former and future students.	Under-filled student places at mobility engineering speciality	Marketing activities concerning promoting mobility-engineering speciality. Refocusing the main speciality of mobility engineering by providing selected subjects in English for Master students in curricula.

Comment			*The mobility engineering is an important specialisation in itself, as well as a strong contributor to the special profile of your logistics program. Hence, it is important to achieve a good balance in number of students between the SCM and mobility engineering specialisations. With more automated and autonomous solutions within the logistics area, we can assume that mobility engineering will increase its importance.*

Table. Comments to 'Action plan' from self-evaluation report, Logistics SP.

Actions	**Comment** **General comment: You have a large set of actions. Should the actions on the list be sorted and prioritized?**
Analysis of interrelationship between different subjects to develop a well-balanced interdisciplinary study programme on Master level with the emphasis on Engineering, Economics and ICT.	*With mobility engineering as part of the program you have a special and relevant engineering part in your program. The focus on quantitative economics and ICT should be focused. Quantitative is emphasised in economics, as a logistics expert often come into cost accounting/estimation processes where quantitative methods in economics are important. Methods from operations research, from basic methods to more specialised including the use of tools are also (very) important for a logistician. Operations research methods are applicable both in an economics and engineering context. This is due to that operations research methods are part of 'all' major logistics tools/software, and that having them as part of a curriculum will develop strong analytical capabilities in your candidates. In ICT, both general programming skills, algorithms and data-structures, and data analysis (also multivariate) are important basic subject areas for a logistician.* *All above was also emphasised and supported by the industry at the site-visit.*

Develop a Logistics Engineering Bachelor study programme (main speciality).	*Important! Develop strong logistical experts with strong quantitative analytical and development skills. Should be developed from the BA level, then the MA level can refine/specialize and put into practice.* *Focus on engineering, quantitative economics and ICT. See comment above.* *A logistician needs soft skills, but that can be trained for instance through case work in the LogInn lab. But much more, she or he needs strong quantitative analytical skills to cope with the requirements of today and tomorrow. The blend with mobility engineering in the MA program was a smart move. But don't forget to work on the BA level as well.*
Development of English language mobility engineering module inside the new Logistics study programme (Master level).	*Important as mobility engineering especially related to automated and autonomous solutions is a large research field, where all results are published and communicated in English.*
The development of TalTech Logistics lab "LogInn".	*Remember to focus on the tools that shall be available in the lab (software), and how you develop process(es) for use of the lab and tools in different cases and theses' work.*
More R&D funding.	*All want more R&D funding. Focus on how you can obtain it, start with a proactive search to get an overview of potential sources, requirements for funding and also likelihood of achieving funding.* *This is also a SPG issue where the heads of all five study programs should meet to share ideas and develop a strategy for how to obtain more (external) funding. We have seen good examples, so do share them within the SPG.*
More targeted and knowledgeable use of resources of the study programme, to improve/ support engineering component in Logistics programme (Bachelor and Master level).	*Agree. The use of engineering competence from TalTech in the Logistics MA gave us a very good impression. We think that there are more opportunities within TalTech, but hard to find information as most is in Estonian.*

	Note: Remember what we said above regarding engineering/quantitative economics/ICT.
Closer cooperation with companies to increase the number of projects with the companies.	*See aggregate above.*
Closer cooperation with alumni to enlarge the range of guest lecturers and tighten the cooperation with companies.	*See aggregate above.*
Cooperation with high schools to raise awareness among young people regarding the field of Logistics.	*Important. Then you need a strong entry point (an attractive BA study) - see above.* *Let students and faculty/alumni speak at schools.*
Enlarge the role of TalTech MOODLE in the form of good quality e-learning materials.	*Search internationally for good e-learning material within logistics. Much can be found. Look at 'Micro-Masters'.*
Improving and developing TalTech Logistics social media channels.	
Cooperation with logistics and transport associations to increase the impact of the Logistics in the design of qualification standards and participation of the study programme in business training.	*Smart idea. Can the "LogInn" lab be used for business training? Will require good tools and super users of the tools. Can students act as trainers/facilitators, and can it even be part of their theses' work?*
Deeper and more regular international exchange of students and lecturers.	*Requires an english speaking program. This is also a SPG issue, which should be discussed among the five study programs.*

Maritime Studies (MA)

Table. Comments to the 'Aggregate analysis of the study programme' from the self-evaluation report of the Maritime Studies SP.

Assess-ment area	**Strengths**	**Application of strengths**	**Areas for improvement**	**Activities for eliminating weaknesses**

Study programme	The uniqueness of the programme: the only master's level programme in Estonia in the maritime field Based on the results of a large-scale labour market' and graduates' surveys Continuous strong feedback from employers/alumni and students through Programme Advisory Committee Strong coherence and consistency between the master' studies programme and the Maritime Institute programmes for professional higher education Increased share of courses taken from other TalTech structural units Diversity of the programme: a significant number of non-maritime courses Flexibility of the programme: cross-use of courses Practical orientation and applicability of final theses because students' employing in companies Good cooperation with foreign maritime universities	Using the uniqueness of the programme in Estonian context in marketing activities Possibility to involve Programme Advisory Committee members and other high-level specialists as guest lecturers Implementation of international modules to the programme through international collaborative projects	Unsuitable timetable at TalTech main building for full-time employed students Some courses have rate that is remarkable lower than average rating of programme Insufficient internationali-sation of study programme Insufficient number of guest lecturers	Improving the cooperation with other structural units in order to find the most suitable solutions for timetable in main building of TalTech Enhance work with lecturers whose courses have received a low rating Enhance an invitation of guest lecturers from other higher education institutions and businesses Continue participation in international consortia with a view to bringing more international dimension into the programme

Comment	*SP has taken the role of leading maritime management training provider and has done it well within Estonian national interest group.* *Cooporation with industry stakeholders seems to be in good level and SP decision makers and teachers possess sufficient understanding of the industry needs and that is reflected to SP contents.*		*Supply chain stakeholders are likely to work more closely together in the future when information transfer and digitalization make application of intelligent technology realism in delivery of goods to people. For the Maritime Studies Study Programme ability to meet challenges with future supply chain development, more collaboration is needed outside own university and outside Estonia. Science cannot be challenged unless it is understood internationally.*	*International studies and open doors for collaboration and student/teacher exchange between SP and TalTech and universities abroad. International collaboration also opens possibilities for employment abroad and lower threshold to seek jobs from outside Estonia.*
Re-sources	Adequacy and good fitting of classrooms and other facilities Good equipment with modern technologies and technical means for studies The only in Estonia well-equipped maritime specialized library in the EMERA The covering of courses by special literature and teaching materials in foreign languages (mainly in English) is good	Possibility for up-to-dating courses operatively Using of new teaching methods and resources Using electronic tools and web environment to create and use effectively learning materials	Shortage of special literature and teaching books in Estonian	Increasing the capacity and diversity of teaching materials in the e-environment Translation of the books and other teaching materials from foreign languages to Estonian The compilation of teaching books in Estonian by lecturers

	Possibility to use TalTech main library, including all major databases			
Comment	*Availability of information is good and is made easy to access for students and teachers. There is free access to otherwise very costly scientific literature and articles that are published in internationally recognized, peer reviewed journals, for students. These eases, among all else, thesis work.*	*Teachers seem to have good collaboration among each other as well as within TalTech as larger entity. Teachers are familiar with the use of the offered teaching tools and methods. Cooperation with other SP's seems good. Library services are used actively also utilizing the possibility to access material online through VPN.*	*Study scheduling seems to favour those that have an employment leaving those that study full time with awkward daily schedules with lessons in late hours in the evenings. This inevitably effects also teachers work scheduling leaving potentially long gaps in the middle of the day. This again leads to teachers work in SP being less attractive.*	*Schedules should be planned in accordance with student needs. When group consists of multiple different situations such as full time and part time students, a possibility for distance learning tools should be considered. That would allow course to be scheduled individually within given time frame unlike currently, where majority of teaching is class room sessions either on site or online.*

Teaching and learning	The number and quality of teaching aids and professional literature is sufficient for the effective functioning of the teaching process Quick and detailed feedback on the quality of the teaching process All courses have compulsory e-support modules Teachers have a possibility to participate in a number of refreshing courses of TalTech Well functionally system SIS for getting of students' feedback about courses and teachers	Possibility to respond promptly to changes in the field in the teaching process The Head of a Study Programme, in collaboration with the Programme Advisory Committee, can respond quickly to the needs of changing and developing the programme Using e-learning in studies in an appropriate proportion	Incomplete participation in refreshing courses, including those concerned to e-learning	Enhance teachers' participation in refreshing courses, especially on e-learning topics
Comment	*There appears to be good access to modern tools and aids for teaching as well as good availability off literature and material to support the teachers work and smoothen the learning process. Those tools are used a lot but there is clearly more than this to be done to take out all advantages offered by the faculty. Teachers have good influence to contents to SP being thus able to reflect changes rapidly following industry needs. This necessity for rapid response is only to grow in the future.*		*Personnel tend to be happy with what they have now, and necessity to novel approaches is seen relatively low, although talks of new approaches is generally very positive.*	*Attendance to courses and learning sessions that have potential in guiding teachers to use modern tools for teaching as well as utilization of new learning methods should be made mandatory.*

Teaching staff	Majority of general studies' lecturers have a PhD degree and as a rule are actively engaged in R&D activity Teachers of specialty courses have a good professional knowledge and practical experience in maritime field An effective combination of experienced lecturers and young practitioners or PhD students in the teaching staff Teachers of specialty courses are able to teach in English	The regular renewing and up-to-dating of courses by teachers More effective using of ERASMUS+ opportunities for teachers exchange	Insufficient participation of special courses' teachers in R&D activities High age for some teachers Difficulties in total transition to e-supported training	More attracting the special courses' teachers to research and development activities To force the lecturers to take in use more computer based learning and to develop e-courses. Renewal and rejuvenation of teaching staff
Comment	*Ability to teach in English is a great benefit without a doubt. Researchers` background should be a must when master's level education is delivered.*	*The fact that Erasmus+ is not more widely used, tells the story of lacking relationships with foreign universities and inability or unwillingness to work solely in English language.*	*Research and development activities are not made attractive to staff, or students, for that matter as they are clearly lacking wide shoulders in genuinely international domain.*	*Teachers could have more influence in their own training processes. Encouragement could be achieved partially through possibility to influence, but also through mandatory mechanisms. These trainings and upkeeping of professional skills is a must to all professionals, why should it not be the same for teachers? Actually, it should be more applicable necessity to teachers than to any other group of professionals.*

Students	Highly motivated and dedicated students in the programme High percentage of dropped out students who later return to the programme and finish their studies Diversity and flexibility of the programme, giving students more choices in their own career planning An effective counselling system in the Maritime Institute	More effective and personalized counselling	Too big density and volume of studies for students who are full-time workers Absence of the possibility of extending studies without financial sanctions Incomplete involvement of students in research and development activities	Reduce the pressure on students regarding to graduating at nominal time Enable part-time studies without financial sanctions More active involvement of students in R&D activities through the selection of relevant final theses' topics
Comment	*Attraction to work is a burden that eats motivation from studies. Estonian education system is young as it is, and possibilities for continuing studies is limited with narrow scope of study programmes for example doctoral studies.*	*Students individual needs can be taken better into account by offering studies that are not bound to times or days, but that have a flexible enrolment.*	*Governmental support for students is in favour of those that have monetary readiness to study without necessity to work at the same time. This places students in unequal position and highlights risk for dropping out for those that are forced to work during studies.*	*Society must realise, that studying is working. The more focused studies the society can produce, the better production there is for balanced well educated professionals that uphold the industry and economy.*

Table. Comments to 'Action plan' Maritime Studies SP self-evaluation report.

Actions	**Comment**
1. To coordinate the activities of the PAC, to implement the recommendations of the PAC in the development of the programme	*Industry connection to SP contents is to be kept tight.*

2. Together with Centre of Research and Development of the Maritime Institute to participate in the Maritime Innovation Management project with purpose to add a new international module to the programme	*Project assignments are great way to enhance collaboration with outside actors as well as offer subjects for thesis works for students.*
3. To involve experts from business as guest lecturers, including PAC members	*Highly recommended, while these need to be well planned to add value to studies. Practical problem-solving skills of students are highlighted as an issue for the employers. That should be kept in mind when planning studies business lecturers are to join.*
4. To create e-support modules for all courses of programme	*Yes, and with particular attention to English language studies with English language material.*
5. To bring visiting lecturers from abroad through Erasmus+ exchange programme or other programmes	*Yes, although it remains important to send students in exchange as well to establish genuine collaboration programmes.*
6. Translation of teaching books from foreign languages to Estonian and compilation the original books in Estonian	*When study programme language is Estonian, yes. Material should be in line with teaching language.*
7. Attraction the teachers and students to research and development activities	*Certain amount of research should be mandatory part of teachers resource planning.*
8. Preparation of research publications by graduates in field journals (eg TransNav Journal) for raising the scientific level of theses	*Peer reviewed journal articles are an end result of quality research work, which again is necessity for an academy to co-exist with surrounding research environment.*

Navigation (Professional HE)

Table. Comments to the 'Aggregate analysis of the study programme' from the self-evaluation report of the navigation SP.

Assess-ment area	**Strengths**	**Application of strengths**	**Areas for improvement**	**Activities for eliminating weaknesses**

Study programme	Labour market demand Practitioners and professional specialists are involved in teaching International co-operation in research and development projects Maritime courses for everyone and conventional courses for seafarers Providing information to the alumni and employers on the activities of the Academy in the form of a newsletter Constant cooperation with alumni and professional associations on the university's feedback surveys and questionnaires on teaching and courses Involvement of employers, alumni and students in the work of the study programme committees	Involvement of employers, alumni and students in the work of the study programme committees More active marketing of admission to increase the number of potential students	Increase participation of the employers, alumni and students in the study programme development Decreasing number of student dropouts	Useing the results of the survey for study programme development Expanding cooperation with general education schools and vocational schools to attract more suitable students
Comment	*Navigation and maritime training have a firm foothold in TalTech and long tradition within Maritime Academy, as it used to be. Contacts with alumni are great upholding relationship with*	*Maritime is no longer as conventional area of industry as it used to be. Navigators work is nowadays nothing less than operation of complex sociotechnical*	*Governmental support for students is in favour of those that have monetary readiness to study without necessity to work at the same time. This places students in unequal position and*	*Society must realise, that studying is working. The more focused studies the society can produce, the better production there is for balanced well educated professionals that*

	industry and potential employers.	*system. Modern navigational bridge is a technically very demanding working environment and the education qualifying to that work should be advertised as such.*	*highlights risk for dropping out for those that are forced to work during studies.*	*uphold the industry and economy. Mechanisms should be established to support lingual efforts of student to further assist them in joining their surrounding group of study. At this time failure to learn Estonian leads likely to dropping out, if this is accepted, then amount of dropouts is there to stay.*
Resources	Modern Simulator Centre Participation in International projects Continous renewing of learning tools Study literature published in Estonian Sufficient availability of educational material in English Access to all the important databases for learning	Improving practical skills Motivating the lecturers of specialty courses to compile study literature	International co-training on simulators within the Network More e-courses and study video tutorials	Translating more professional literature
Comment	*Simulator and resources accredited to its utilization is a great resource adding a lot of value to a training facility that has no school ship.*	*Briefing and debriefing session with the simulator sessions are excellent.*	*Simulator is tying a lot of resources; however it still has a lot of technical issues that cause delays and unexpected cuts to training scenarios. Study program management are paying attention to this.*	*Some of the emergency literature and associated signs in simulator were in Estonian. Language of the navigator is English. That is not choice for us to make, but an industry fact.*

Teaching and learning	Objectives have been defined to ensure the quality of the teaching and learning process Regular student feedback on teaching methods and organisation of studies Taking student feedback into account System of continuing education courses for the teaching staff Effective APEL process	More extensive participation of teaching staff in continuing education courses	Improvement of the methodological skills of the practitioners of the specialty	Conducting continuing education courses on teaching methods for the practitioners of the specialty
Comment	*Student feedback mechanism has all components to success. Teachers and students have a very open relationship and discussions are conducted in open minded and professional atmosphere.*	*Unwillingness to participate in teaching and education development programmes is at least partially due to aging of the staff. Personnel are divided in two groups, very young and very old. Measures taken to attract young candidates into faculty positions.*	*Teachers are somewhat happy with how things are done now, and no necessity is seen to develop training programme.*	*Likely this challenge will be rectified with the oncoming recruitments. Participation into development programmes and self-developing should be mandatory part of teachers resource planning.*
Teaching staff	Professional competence and experience of our lecturers Possibilities for lecturers to gain international experience	More extensive use of the ERASMUS funds	To increase the number of younger teaching staff Use of the opportunities for international mobility by the teaching staff within ERASMUS programme	Collaboration with the employers and the alumni to improve teaching skills by looking back method Collaboration with promising students with the aim to get younger teaching staff

Comment	*Very competent staff to meet the requirements of today.*	*Erasmus+ participation and collaboration with industry are good tools to keep the SP up to date.*	*No preparation in the oncoming challenges with digitalization. What is the sailor of the future going to actually do for a living? This thinking is somehow extracted from the work scope of the training programme.*	*International collaboration and participation to international research projects that are researching opportunities of novel technologies for maritime domain.*
Students	Collaboration with the employers and alumni to improve teaching skills of lecturers Strong Student Union in EMERA	Involvement of employers, alumni and students in teaching and admission marketing	Involving pupils in projects Still high dropout rate To increase the number of students to participate in ERASMUS programme	Counselling for students so they would know better their opportunities during the study
Comment	*Good spirit among students, very tightly joined group being motivated and belief in future opportunities.*	*Encouragement to collaboration and student exchange.*	*Measures to reduce drop-out rate should be taken. Both limiting uptake of non-motivated students, as well as focus on integration of admitted students.*	*Mechanisms should be established to support lingual efforts of student to further assist them in joining their surrounding group of study. At this time failure to learn Estonian leads likely to dropping out, if this is accepted, then number of dropouts is there to stay.*

Table. Comments to 'Action plan' from self-evaluation report, Navigation SP.

Actions	**Comment**
More active admission marketing	*This is easiest done when studies are international offering education in English.*

Involvement of employers, alumni and students in the work of the study programme committees and taking feedback into account when developing the teaching and learning process	*This should have high focus in participation to future demands of seafarer.*
Compiling professional study materials	*Study material should be in English as this is industry language. All studies lowering threshold to seek job from abroad makes the study programme more popular and attractive with wider employment possibilities.*
Methodological training for teaching staff and practitioners of the specialty	*Focus should be drawn in successful simulator sessions as they are technically demanding currently possessing teachers with multiple issues.*
Substantive analysis of the courses and assessment criteria	*This especially with future needs in mind. We encourage maritime personnel to familiarize with IAMU actions and preparations and further to work done with GMP draft document (Global Maritime Professional).*

Port & Shipping Management (Professional HE)

Table. Comments to the 'Aggregate analysis of the study programme' from the self-evaluation report of the Port & Shipping Management SP.

Assess-ment area	**Strengths**	**Application of strengths**	**Areas for improvement**	**Activities for eliminating weaknesses**

Study programme	Labour market demand. Only study programme in Estonia focusing on (international) maritime transport management.	Being in touch with employers, employees etc.; Making regular research on trends in labour market. Giving the programme more "international touch" – e.g. English language courses and lectures and lecturers; Systematic approach to support our students to study and make practice abroad; Encourage teaching staff to being more active internationally; Being involved in international projects where our teaching staff as well as students take part of; Organizing (alone or jointly) international events (conferences, seminars, summer schools etc.).	Stable environment for programme development. Increase share of courses in English language. Look for the possibilities to include studying or making practice abroad.	Filling the tenure position with person, who has international experience, is able to give lectures in English, not to mention active participation in research on maritime matters. Conduct research of foreign study programmes and create framework, which helps our students to study and make practice abroad. It means also closer cooperation with foreign academic institutions and companies.
Comment	*Port and hinterland logistics will be closing towards shipping and vice versa in the future. This imminent development will guide supply chain actors working closer together. Borders between study programmes*	*SP has close connections to other study programmes and cooperation is recognized. International connections are with a lot of value here, but it seems there are still domestic doors study*	*Student and staff exchange should be broader as well as connections to shipping and maritime management. Regulatory framework in shipping, such as chartering agreements and*	*There are options in closing the relationship with navigation and especially maritime management. It should be clear for students, that future professionals are expected to have a very broad understanding of the*

	thus should reflect this change in the roles of stakeholders.	*programme has not opened.*	*responsibilities for the parties involved is a complex environment to act and requires understanding of the entire supply chain.*	*entire supply chain, and not only their own slot within the chain.*
Re-sources	Resources correspond generally with modern needs of teaching Possibilities to organize international events (conferences, summer schools etc.) Library is well equipped with English language programme specific literature. Possibility to use scientific databases.	Stay up-to-date with the developments Utilizing the possibilities to organize events. Encourage teachers to create assignments, which completion demands use of scientific databases for students.	There is room for improvement in course specific ICT solutions Lack of Estonian language teaching material in speciality courses.	Use more actively than before different funding possibilities for obtaining contemporary teaching means. Teachers taking part in different trainings, seminars, conferences etc. to be informed about new possibilities of using contemporary means in teaching. Look for the possibilities to create by selves contemporary teaching solutions. Encourage teachers to create Estonian language teaching material.
Comment	*Resources are made available and are utilized.* *Teaching staff is a well-balanced mix from different areas of expertise in the field of study.*	*Event organizing is a great platform to increase visibility and attract cooperation and students, however as a platform for research it has smaller value.*	*Room for improvement in research field. All evaluated SP's are now part of TalTech, meaning a visible sliding from applied sciences towards sciences should be seen. This should happen by itself with full scale integration to what TalTech is doing.*	*International projects are excellent platforms for collaboration and broadening research activities, as well making SP known nationally and internationally.*

Teaching and learning	Positive feedback from students to teaching means. Process and e-course of writing thesis.	Addressing to the critical comments of feedback. Based on the feedback improving thesis' writing process.	Better support for practical training. Using ICT and web-based solution in teaching. Involving more scientific research methods in study process.	Closer cooperation with companies and institutions for practical training. Raising awareness of teachers about ICT and web-based teaching solutions. Raising the scientific research methods issue regularly amongst teaching staff, encouraging closer cooperation between teachers about the matter. Cooperate with companies to use their problems as research courses in study process
Comment	*Thesis is challenge throughout study programmes. Feedback mechanisms are there and they are used.*	*Feedback from thesis processes was listened, although it landed from the industry.*	*Thesis quality is light weight and practical problem-solving abilities are not there from industry standpoint.*	*Students are to be provided with writing assignments, and lessons for scientific writing should be established. As stated above, companies have practical issues and challenges that can be used as thesis subjects and assignment tasks for students.*

Teaching staff	Competence and experience in the area of specialisation	Regular updating of courses	Better usage of contemporary teaching means and methods Teaching staff should be more active in research field Utilisation by teaching staff of opportunities for increasing international mobility Increasing share of English language in programme Increasing international knowledge in programme	Teachers attending respective conferences, seminars, workshops. Bringing together R&D department and teacher has to get more ideas for research and emphasizing to realize those ideas. Proceeding with the professor tenure process
Comment	*Broad understanding of the field of study. Staff provides a balanced mixture of mature professionals and younger generation experts.*	*Good connection with industry seems to support updating of course contents and SP. This is supported by the academy, although process is fairly slow.*	*Utilization of English language is not in the level of facilitating international collaboration with industry and other universities.*	*Language should be ideally in english, as the study is very international requiring cooperation with multiple nationalities and languages. Use of English during studies would lower the threshold to use it in working life.*

Students	Possibilities to study abroad Collaboration with the employers and alumni	Raising awareness amongst students about the possibilities studying abroad (briefings, involving students being abroad) Tightening the contact with employers and alumni. Better usage of employers and alumni in admission marketing, study process	Better branding of the programme High dropout rate in 1st year Involving more students in research projects Increasing student mobility through ERASMUS	Creating marketing plan for programme Increasing student – teacher staff – academic support unit communication Introduction of interviews at the admissions (starting 2019/20) Increasing number of researches where students can be involved. Tighter cooperation with employers in composing thesis' themes. Raising awareness amongst students about the possibilities studying abroad (briefings, involving students being abroad)
Comment	*Students formed a joined and openminded group of young professionals. Students seem to have clear career goals and ideas of where to work in the future.*	*SP connections to industry assist students in maintaining positive mindset for future employment opportunities and their slot in the working life.*	*Measures to reduce drop-out rate should be taken. Both limiting uptake of non-motivated students, as well as focus on integration of admitted students.*	*Profile of SP should be dragged up. This is not an overnight project but requires patience and resilience. Sp should show and advertise, that future outlook for the student graduating this SP is promising with multiple opportunities and good income levels. This SP is among the ones most are looking at, when massive changes in supply chain become more and more reality.*

Table. Comments to 'Action plan' from self-evaluation report, Port and Shipping Management SP.

Actions	**Comment**
Reducing dropouts in 1st year/ Recruit more motivated students	*Profile of SP must be brought up. This is a cutting-edge SP where all possibilities are to meet demands of future professionals serving intelligent supply chains. This should not be a third option SP. Do not hand over study places so easily. Just the fact, that study place is not easy, is an attraction itself. Nothing, that comes easy, is worth it, as they say.*
Professional development / improvement of the qualification of teaching staff. Implementing "Good Lecturer Development Program".	*Good connections to industry are to be maintained while mechanisms to enhance staff self-development should be in place from TalTech. This does not mean blind staring to student feedback. Remember, that these students are not able to determine, what is important for them in the future. We teachers are here for that purpose, since we know where the student are going to.*
Filling the position of professor tenure	*Self-development. is a must. Doctoral degree does not equal to a good teacher, and as such degrees should not be overly highlighted. However, doctoral degree is a recognition for the ability to do independent research and that adds value to that required sliding towards science as part of TalTech.*
Increasing R&D projects involvement with teaching process and vice versa	*Research is part of providing answers to a question and as such R&D should be integral part of teaching and resource planning. Research projects should not be a burden but a gateway to research and cooperation.*
Developing teaching material/means in the area of specialization	*Technology made available should be utilized in full. Industry stakeholders could perhaps be introduced more to planning of studies.*

Development of special classroom for port and shipping study line	*Can the purpose of this be to strengthen the class culture and integration of students around the learning process?*
Enhancing communication between programme and domestic partners	*As already mentioned, there are doors domestically not opened to date.*
Better branding of programme	*As above. Profile of SP must be brought up. This is a cutting-edge SP where all possibilities are to meet demands of future professionals serving intelligent supply chains. This should not be a third option SP. Do not hand over study places so easily. Just the fact, that study place is not easy, is an attraction itself. Nothing, that comes easy, is worth it, as they say.*
Development of international collaboration / Utilisation of international mobility	*As is the case with all SP's, international connections provide peer review for SP development and reflect success of meeting the goals in international context as this is where the competition is.*

Waterways Safety Management (MA)

Table. Comments to the 'Aggregate analysis of the study programme' from the self-evaluation report of the Waterways Safety Management SP.

Assessment area	**Strengths**	**Application of strengths**	**Areas for improvement**	**Activities for eliminating weaknesses**
Study programme	High demand of hydrographic surveyors in the international market.	Motivate students to study hydrography, as a very interesting and well-paid profession.	The curriculum is not yet internationally recognized.	Submit for Category A Programme (according to IHO classification).

Comment	*We believe that in a life-long perspective there are many application areas in which a background in hydrography is relevant and will be a strong educational background. The combination of subjects are focused and broad, theoretical and practical. You should provide success story examples of alternative career paths for alumni with this education.*		*The IHO Cat "A" application process is one of the most important processes for the development of this study program. It will and should lead the SP development until settled. Important to secure that the head of the SP has time and resources to dedicate herself to this. Very good relationships (industrially and academically) established to support this. Important both for study plan development, student recruitment and mobility and as basis for research outreach.*	
Resources	Possibility to use specific equipment for training purposes provided by partners.	The practical training with up-to-date equipment facilitates students to proceed with studies	The number of admitted students is increasing but still is modest	To continue developing outreach activities to market the study programme.
Comment	*Very good progress!*	*Very good progress!*	*Acknowledged, and many good initiatives in place.*	*Use the IHO Cat "A" or "B" process, and build outreach activities related to this.*
Teaching and learning	Special financing provided for curriculum development	Continually improve the technical equipment and infrastructure to meet international requirements.	Old teachers are not familiar on efficient use of Moodle for teaching purposes.	Promote programmes on development of e-couses among teaching staff
Comment	*Important! Focus now to secure a thorough process towards IHO Cat "A" or "B" classification.*	*Very good progress! Is also a basis for R&D collaboration, and student engagement in R&D – important!*	*Make use of TalTech courses for training. These are valuable to you, and will not add load to your limited resources.*	*Will be resource demanding. Should be assessed with respect to how important this is w.r.t achieving an IHO Cat "A" or "B" certification, and potentially postponed to later.*

Teaching staff	TalTech has lounched several program in order to facilitate the professional development of the academic personnel	Encourage academic staff to use the possibilities for self-development provided by TalTech	The shortage of special Estonian textbooks and supplementary teaching materials.	Encourage teaching staff to publish more textbooks/learning materials in Estonian
Comment	*The use of these courses should be made part of a formal development plan. THis again should be developed and shared among all SPG programs. You should use the added momentum of a group, build on and support each others development.*		*We think this might be wrong use of resources. It may be counterproductive if you want more international students and increased student mobility. Could also be counterproductive for the drop-out rate of Russian-speaking students. However, as explained it can have use by the professional discipline community in Estonia.*	
Students	High demand of the professionals in the field of waterway management	Invite alumni to give extraordinary lectures in order to motivate students proceed with studies	Too high rate of dropouts in the WSM programme	Continue to implement the measures targeted to decrease the dropouts
Comment	*In Estonia, regionally and internationally.*	*OK at present. Also, bring evidence of the general importance of the study and how it may lead to different career paths.*	*Agree.*	*IHO acreditation & Language*

Table. Comments to 'Action plan' from self-evaluation report, Waterways Safety Management SP.

Actions	**Comment**

Submit for Category A Programme (according to IHO classification)	*This is ONE of the most IMPORTANT ACTIONs for the study program. Effect on; quality assurance of study plan, drop-out (most probably), student mobility – in/out, and employment opportunities.* *Contributes directly to the Maritime Institute/TalTech strategy and vision statement.*
Offer study for International students	*See above.*
Continue support the preparation of methodological teaching materials and faculty involvement in scientific research projects	*To meet the above, the methodological teaching material need to be internationally available with respect to language. We have seen a good start on R&D engagement, but this needs to evolve. Publish good examples of R&D work as success stories internally, and not least for the students – reference to MIT 'UROP' projects*
Motivate teaching staff to participate in training courses organized by TalTech and other partners.	*Should be formalized as part of personal development plans.*
Encourage the continued professional development and further training of the academic staff, especially in the use of contemporary teaching methods	*Should be formalized as part of personal development plans.*
Maintain good relations with prospective employers to learn about their expectations for core competencies	*State-of-art practice shown in self-assessment and site-visit.*
Develop speciality modules (as an elective courses) within the study programme	*Should be made in accordance with IHO Cat. "A" application. The Cat "A" classification by IHO is an important opportunity, but will also guide future developments.*