

Delft University of Technology *Advisory Report*

NVAO | Department The Netherlands | Institutional Audit
1 August 2017

Contents

1	Executive Summary	4
2	Introduction	6
2.1	Aim and objectives	6
2.2	Expert panel	7
2.3	Audit process	7
3	Institution under Review	9
3.1	General data	9
3.2	Profile	9
3.3	Key figures	10
4	Assessment	11
4.1	Vision and policy	11
4.2	Implementation	14
4.3	Evaluation and monitoring	19
4.4	Development	22
4.5	Final conclusion	24
4.6	Recommendations	25
	Appendix 1 – Panel	27
	Appendix 2 – Accreditation Record	29
	Appendix 3 – Visit Programme	33
	Appendix 4 – Documents	40
	Appendix 5 – Abbreviations	43

1 Executive Summary

A panel of peers conducted an institutional audit of Delft University of Technology (TU Delft) in May 2017. TU Delft meets all four standards of the NVAO assessment framework for audits. Therefore, the final conclusion of the panel is positive.

TU Delft is a growing research-intensive university with an increasing focus on education. The university has a strong quality culture; its quality assurance system is not an end in itself, but a means to emphasise this quality culture. The audit panel investigated all components of the quality cycle and concludes that the quality system meets all aspects.

TU Delft has developed a new vision on education. According to the panel, the vision accurately portrays the university's profile and societal developments and is student-centred - thus in accordance with the European Standards and Guidelines (ESG). It encompasses the students who will be served and the institution's distinctiveness. The vision is broadly supported by internal and external stakeholders, who are aware of the key characteristics of the university.

TU Delft is committed to providing high quality education. The university has an impressive accreditation record with all bachelor's and master's degree programmes being assessed with a positive result in the period under review. A challenge for the university, in achieving its ambitions to become a world-class institution, is to improve its track record with more 'good' and 'excellent' grades in the accreditation of individual study programmes. National and international benchmarks can be used to make these ambitions more specific.

According to the panel, the implementation of key policy themes - the Study Success Programme, Internationalisation, and Open and Online Education - has been successful. The use of a top-down as well as a bottom-up approach both in the development as well as in the implementation processes worked well. The university applies various measures to systematically evaluate and monitor these policies and adds extra measures where necessary. To further improve the educational quality, the panel recommends taking several steps to stimulate teachers in lifelong learning.

TU Delft is aware that it will be a challenge to maintain the high-quality education in the near future with growing student numbers. In the past six years, the student population has grown from 17,031 students in 2010 to 21,758 in 2016. Although clear strategies are formulated with respect to the key policy themes mentioned above, no university-wide comprehensive strategy has been defined yet with respect to the significant growth in student numbers. The new Strategic Plan 2018-2024 is the appropriate opportunity to address this issue. The panel's most important recommendation is therefore defining a clear strategy with pre-set goals on the growing student population. In this strategy, the consequences of various aspects should be incorporated, like internationalisation, study spaces and laboratory facilities, staff capacity, workload, healthy work/personal life balance, diversity, balance in gender, housing capacity for students, and the connection between research and education as well as a healthy balance between the two. In the opinion of the panel, safeguarding the quality of education is the most important aspect for all students irrespective of their numbers.

Overview of the panel judgements

Standard	Judgement
Vision and policy	Meets the standard
Implementation	Meets the standard
Evaluation and monitoring	Meets the standard
Development	Meets the standard
Final conclusion	Positive

Given the outcomes of the institutional audit the panel advises NVAO to take a positive decision.

The Hague, 1 August 2017

On behalf of the panel,

Frank van der Duijn Schouten,
chair

Annemarie Venemans-Jellema,
secretary

2 Introduction

2.1 Aim and objectives

The institutional audit assesses whether an institution harbours a quality culture and a system of quality assurance which guarantee that the education offered by the institution meets (inter)nationally accepted standards and demands. The institutional audit takes the ambitions, vision and choices formulated by the institution as a point of departure, and reviews the realisation of these ambitions.

The audit focuses on four questions:

1. Are the institution's vision and policy concerning the quality of the education it provides widely supported and sufficiently coordinated, both externally and internally?
2. How does the institution realise this vision on quality?
3. How does the institution monitor that its vision of quality is realised?
4. How does the institution work on improvement?

Institutions undergo an institutional audit on a voluntary basis. The audit functions alongside the assessment and accreditation of individual study programmes. Passing the institutional audit successfully allows institutions having their programmes assessed using the framework for the limited programme assessment. In all other instances, programmes are assessed according to the standards for the extensive programme assessment.

In the first round of audits (2011 to 2016) 35 institutions of higher education passed the audit. These institutions offer around 80% of the total number of degree programmes in Dutch higher education.

NVAO appoints a panel of experts ('peers') for conducting the institutional audit. These experts have no ties with the institution under review or any other conflict of interest. The panel comprises leading expertise on the management of institutions, educational expertise in higher education, and audit expertise and/or expertise in the design and efficiency of systems of quality assurance. Students and the professional field are also represented in the panel.

A qualified and independent secretary assists the panel and writes the advisory report based on the discussions in the panel. NVAO offers a training and/or briefing to all panel members and the secretary prior to the audit. An NVAO staff member coordinates the audit and acts as a liaison officer between the institution and the expert panel.

Full details of the institutional audit process can be found in the framework posted on the NVAO website: Assessment Framework for the Higher Education Accreditation System of the Netherlands 2016.

2.2 Expert panel

The expert panel comprises:

- Professor Frank van der Duijn Schouten PhD, Dean of the Faculty of Philosophy, Erasmus University Rotterdam, former Rector of Tilburg University and VU Amsterdam, and Professor Emeritus in Mathematics of Operations Research, Netherlands (chair);
- Professor Inger Askehave PhD, Pro-rector for Education, Aalborg University, Denmark;
- Professor Clement Fortin PhD, Associate-Provost and Dean of Faculty (Skolkovo Institute of Science and Technology), Moscow, Russia; Professor Emeritus, Ecole Polytechnique, Montreal, and former President and CEO, Consortium for Research and Innovation for Aerospace (CRIAQ), Quebec, Canada;
- Ir. Peter Struik, General director Sustainability and Environment, Rijkswaterstaat, Utrecht, Netherlands;
- Lennart van Doremalen MSc, PhD candidate in Subatomic Physics, Utrecht University, Netherlands (student member).

The panel is assisted by:

- Annemarie Venemans-Jellema PhD, secretary;
- Michèle Wera MA, NVAO process coordinator.

The resumes of the panel members are included in Appendix 1.

2.3 Audit process

The panel received TU Delft's self-evaluation report (SER) on 31 March 2017. Based on this report, the panel members exchanged views on the topics that might form the object of an audit trail by e-mail. On 13 April 2017, the chair, the secretary and the NVAO process coordinator met with the Vice-President for Education and Operations of the TU Delft, the Director of the department of Education and Student Affairs (E&SA) and a Policy Advisor of E&SA to discuss the programme of the site visit and the choice of audit trails.

The members of the panel exchanged their initial impressions, listed the issues that required clarification and prepared for the different sessions at the site visit by email.

The site visit took place on 15 May to 19 May 2017. The programme consisted of two parts:

- Part I: exploratory visit (15 and 16 May);
- Part II: in depth visit (17 May until 19 May).

The panel members gathered in the afternoon of 15 May to prepare the first interviews. The site visit started with a meet and greet, offering the opportunity for panel and stakeholders to connect in a more informal setting.

During the site visit, the panel met with various staff members, management and stakeholders, such as the Executive Board, the Supervisory Board, the educational management, lecturers, students, quality assurance staff, university services staff and representatives from the professional field. A detailed overview of the visit programme is provided in Appendix 3.

Audit trails

The panel carried out three audit trails to gain more in-depth knowledge:

- Trail 1: vertical trail on past performance and internal quality assurance of two faculties;
- Trail 2: horizontal trail on study success programme;
- Trail 3: horizontal trail on educational developments and innovation.

On Wednesday 17 May, the panel focussed on the past performance trail. The main aim was to review the assurance of programme quality, by examining whether the university's past performance demonstrates its timely identification and effective address of quality risks.

As suggested by TU Delft this trail examined eight programmes in the following faculties:

- Faculty of Electrical Engineering, Mathematics and Computer Science;
- Faculty of Industrial Design Engineering.

TU Delft suggested EEMCS, because it provides good insight in the way the board and faculty management address and handle quality issues when they arise in educational programmes. IDE was suggested, because it shows the way faculty management keeps quality topics on the agenda in a faculty with a good track record.

In the morning of Wednesday 17 May, the panel met representatives of the Faculty of Industrial Design Engineering. In the afternoon, the panel met with staff, students and other stakeholders of the Faculty of Electrical Engineering, Mathematics and Computer Science.

During day four of the site visit, the panel focused on the two horizontal trails. As suggested by Delft and endorsed by the panel, the thematic trails focussed on the Study Success Programme and educational development and innovation. They provide an illustration of two sides of the governance philosophy of the TU Delft: 'top-down where needed, bottom-up where possible'.

The Study Success Programme is a project undertaken by the university to improve the quality of especially the bachelor's programmes in order to decrease the dropout rate and reduce the average duration of study. The Study Success Programme is an example of a top down decision by the Executive Board. The impetus for the Study Success Programme was the overly long average turnaround time among bachelor's students in comparison with other universities in the Netherlands and abroad.

Educational developments and innovation are important pillars of TU Delft's educational quality policy, in particular the development of open and online education. The second horizontal trail is an example of a bottom-up approach, in which progress has mainly been achieved by stimulating and facilitating educational developments and innovation both at central level and in the faculties and programmes.

Advisory report

After the site visit, the secretary drafted the advisory report, which was circulated among the panel members for comments and amendments. Those comments and amendments were incorporated in a version, which was approved by the panel and validated by the chair on

30 June 2017. This version of the report was then presented to TU Delft with a request to check for errors of fact. The remarks made by TU Delft have been taken into account in this final version.

3 Institution under Review

3.1 General data

Institution	Delft University of Technology
Location	Campus Delft
Type	Publicly funded university

3.2 Profile

TU Delft positions itself as one of the world's leading training grounds for engineers and views its role in society as supplying technological solutions that take us significantly further along the road towards sustainability and a flourishing economy.

TU Delft's characterises its educational profile as a compact and in some cases unique selection of engineering degree programmes providing high-quality initial and post-initial education, a strong societal and international orientation, and the integration of modern and digitised teaching methods.

TU Delft is a publicly funded university. The Executive Board is the overall governing body and is accountable to the Supervisory Board. Members of this board are appointed by the Ministry of Education, Culture and Science (Ministry of OCW). Education and research at the university are organised within eight faculties:

1. Aerospace Engineering (AE)
2. Applied Sciences (AS)
3. Architecture (A+BE)
4. Civil Engineering & Geosciences (CEG)
5. Electrical Engineering, Mathematics and Computer Science (EEMCS)
6. Industrial Design Engineering (IDE)
7. Mechanical, Maritime and Materials Engineering (3mE)
8. Technology, Policy and Management (TPM)

Together with the Executive Board, the eight deans of these faculties form the Operational Committee. Together, they collaborate on matters of general importance; issues that affect the university in its entirety.

Within each faculty, the Dean bears overall managerial responsibility for the education provided by the faculty. Other important positions in relation to education within each faculty are the Director of Education and the Faculty Head of Education and Student Affairs. The Director of Education supervises the Directors of Studies and/or programme coordinators of the various degree programmes run by the faculty. Every faculty comprises its own Education and Student Affairs (E&SA) department, which supports the faculty's degree programmes by completing tasks such as teaching coordination, academic counselling for students and educational quality assurance.

The university is supported in its core tasks by the University Services (UD), which is composed of ten departments. The Department of E&SA facilitates the education provided by the university through preparing and implementing the education policy, carrying out the necessary educational administration, and offering a range of support activities for students and lecturers. The Director of Education and Student Affairs heads the department.

3.3 Key figures

Student numbers	Total number of students (2016)	21,758
	Bachelor's students (2016)	11,395
	Master's students (2016)	9,933
	of which international students (2016)	4,191
Programmes	Total number of programmes	49
	Bachelor's programmes (2016)	16
	Master's programmes (2016)	33
	English-language programmes (2016)	35
Degrees awarded	Bachelor's (2016)	1,988
	Master's (2016)	2,671
Scientific staff	Total (2016)	2144.6 fte
	Assistant, associate and full professors (2016)	890.9 fte
Financial data	Total budget (2016)	First stream: 459.6 M€ Second stream: 45.5 M€ Third stream: 139.2 M€

4 Assessment

4.1 Vision¹ and policy

Standard 1 – The institution has a broadly supported educational vision and pursues a corresponding policy focused on the internal quality assurance of its education.

Findings

TU Delft's mission is to make a significant contribution towards a sustainable society for the twenty-first century by conducting ground-breaking scientific and technological research which is acknowledged as world-class, by training scientists and engineers with a genuine commitment to society and by helping to translate knowledge into technological innovations and activity with both economic and social value (*Roadmap 2020, 2011*). Drawing upon the mission statement is TU Delft's strategic plan, Roadmap 2020, in which it expresses the ambition to belong to the league of world-class academic institutions.

Although TU Delft is a research-driven university, the Executive Board explained during the site visit that, in their view, a top university is one which excels at both research and education. A telling example of how this is translated into policy, are the yearly appraisals of staff members whereby both research and education are taken into account. Although there are no rankings that rate the quality of education, the university views the invitations by Massachusetts Institute of Technology (MIT) and Eidgenössische Technische Hochschule (ETH), to serve as benchmark university, as an example of recognition as a world-class institution by its peers.

Until last year, TU Delft's vision on education was part of the Roadmap 2020, in which 'quality' and 'innovation' are key terms. To coordinate with relevant changes such as rapid technological developments, a breakthrough in forms of digitally enhanced teaching and learning, and shifts in public funding of higher education, the TU Delft acknowledged the need of a revised vision on education. It is currently in the middle of a process of setting this new strategic direction, putting together an '80% draft version'² of this revised vision on education. This 80% draft version describes educational goals and quality ambitions, and identifies possibilities for further development of the educational portfolio and ways of teaching and learning.

This revised vision on education will serve as input for the next Strategic Plan 2018-2024. Last year, the university started with the preparation of this strategic plan. During the site visit the panel noted that all relevant stakeholders were involved in this process. Delft hired a UK-based consultancy firm to interview around 40 people from inside and outside the university. Twelve internal advisory groups consisting of people from different faculties and stakeholders were also involved.

The revised vision on education is shared by all faculties. During the interviews the panel learned that this vision is broadly supported throughout the university.

In its revised vision on education, TU Delft aims to educate graduates who are able to develop technological solutions for society's problems. It wants its graduates to be acknowledged by leaders in industry, companies, governments, non-governmental

¹ The English version of the NVAO framework mentions 'philosophy'.

² Interpreted by the panel as general agreement on about 80% of the text.

organisations (NGOs) and leading research and development institutions around the world as standing out because of:

- their mastery of the scientific foundations of engineering;
- the thoroughness and depth of their disciplinary knowledge;
- their analytical & modelling skills;
- their ability for effective inter- and multi-disciplinary teamwork in international and culturally diverse environments;
- their leadership in designing responsible and innovative technological solutions for societal challenges;
- their problem-solving skills and attitude of getting things done;
- their digital skills, such as programming and data analysis;
- their ability to reflect on the impact of technological solutions in their socio-economic context, including ethical dilemmas.

The vision document shows that education at TU Delft is student-centred. For example, it states that ‘TU Delft should aim to develop a challenge based didactical approach, inspiring students to collaborate in project teams focused on applying their scientific and engineering knowledge and developing collaboration competences and skills to solve real world engineering challenges’.

The educational vision has been translated into an Educational Quality Plan. The current Educational Quality Assurance Plan was drafted in 2009 (*Onderwijskwaliteitsplan, 2009*) and all degree programmes are expected to comply with it. Based on the new Strategic Plan 2018-2024, the current Educational Quality Plan will be reviewed to ensure that it still fully conforms to the vision and strategic objectives. The Educational Quality Plan provides a framework for implementing quality assurance from university level down to faculty and degree programme level.

The 2011 audit panel already noted that TU Delft has a true quality culture that is widely supported by the entire university. This quality culture is obvious to the panel. At all levels of the institution, TU Delft has a robust and clearly articulated governance structure, characterised by extensive networks of standing committees, but also by frequent use of ad hoc committees. Teaching staff, supporting staff and students are all involved in ensuring the quality of education at TU Delft. There is an increased emphasis on transparency in the sharing of institutional data and information.

Decisions are made by means of both top-down and bottom-up procedures. An example of a top-down procedure is the policy with regard to the Study Success Programme, in which the Executive Board set the targets and the faculties were requested to submit a proposal with improvement measures (see also ‘Standard 2’). The policy on educational developments and innovation, in particular the development of open and online education, is an example of bottom-up approach with faculties taking the initiative (see also ‘Standard 4’). Participants of the site visit mentioned that policy making takes time, but the involvement is large: “When a project is put on the website, everyone supports it”.

The growing student population is a central theme and main challenge in the quality of education. In almost every session this topic was put on the table. Various faculties have already implemented some measures, in order to cope with the expanding student population. For example, some faculties are working to identify ways of managing the growing intake, and, where necessary, expand their staff and available facilities to be able to provide good quality education. However, a clear overall policy with pre-set goals on the growing student population has yet to be developed. The dilemmas related to this issue are also discussed at the national level with the Ministry

of Education. The new Strategic Plan 2018-2014 offers a good opportunity to translate this discussion into concrete policy measures.

Considerations

The panel acknowledges the existence of a clear mission at TU Delft and confirms that this mission is broadly supported across the university. It established that, on paper, the mission is primarily research-driven, although it noticed that education plays an equally prominent role. Therefore, the panel suggests to rephrase the mission with a greater focus on education. The main theme of this new mission could be 'Innovation and Research Based Education'.

As previously mentioned in this report, the university states in its mission that it wants to be a world-class institution. The panel encourages the university to strive for excellence and has discussed how to implement this strategy. The panel is convinced that the university understands its place in the world with regard to the quality of education, but it suggests further outlining this in the university policy. The panel therefore recommends defining one or two national or international benchmarks for every educational programme and using these in the evaluation of programmes in midterm reviews. The already existing benchmark initiatives with ETH and MIT can be looked upon as good practice at university level.

The panel has observed TU Delft's vision on education and the process of achieving this vision. In the opinion of the panel this vision fits well in the profile of the university and the developments in society. It both encompasses the students who will be served and the institution's distinctiveness. The panel is pleased with the integration of PhD education in the new vision on education.

In the opinion of the panel, TU Delft effectively ensures the topicality of its vision. The panel applauds the thorough process that the university has undertaken to revise its vision on education in order to coordinate with the changing environment. The process is characterised by a high degree of consultation with all relevant internal and external stakeholders: lecturers, students, programme management teams, student and employee participation bodies and the professional field.

The panel values the fact that both the vision and policies are, in accordance with the European Standards and Guidelines (ESG) student-oriented. During the site visit, it saw several examples of TU Delft's endeavour to general education expectations, allowing and expecting students to take responsibility for their academic education, with support from faculty and peer advisors.

The interviews during the site visit showed that the quality culture is deeply embedded in the thinking and practice of TU Delft's management and staff. The panel noted that the quality assurance system is not an end in itself, but a means to emphasise the quality culture. Generally speaking, the Executive Board sets a target or framework and the deans have a large amount of freedom to implement this in their faculty in a way that best fits their needs. The process of creating new policies at TU Delft is characterised by extensive internal meetings of many different parties. This ensures that new policies are broadly accepted. Although the panel applauds the involvement of both staff and students, and the flexibility that the Executive Board gives the faculties, it recommends avoiding lengthy time frames for decision making and proper actions. The panel is of the opinion that once enough proof and support are gathered, the Executive Board must take the lead in determining and implementing the new policy.

There is ample evidence that the university has developed an adequate policy and strategy with regard to several areas, for instance on internationalisation, open and online education and study success. However, the university considers the growing student population as one of the main strategic challenges. It has been on the Executive Board's agenda for some time now, and is also a recurrent topic in the discussions with staff and students. Even so, the preoccupation with student growth and the challenges that come with this, have not yet resulted in a clear strategy with pre-set goals. Given the high level of urgency related to this issue the panel expects that it will be addressed in the new Strategic Plan 2018-2024 resulting in clear policy measures. Due to the direct consequences for the municipality of Delft consultation with the city council is important.

Judgement

TU Delft meets Standard 1, Vision and policy.

4.2 Implementation

Standard 2 – The institution realises its educational philosophy in an effective manner, which is demonstrated by appropriate policy actions and processes, particularly relating to staff, student assessment, services and facilities, and students with a functional impairment.

Findings

The Accreditation Report makes clear that TU Delft has a track record of 12 bachelor's degree programmes and 24 master's degree programmes being accredited in the period under review. In addition, two new bachelors' and one master's degree programme have gained accreditation. As part of an audit trail on past performance the panel reviewed the internal quality assurance cycle at programme level within the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS) and the Faculty of Industrial Design Engineering (IDE).

During the interviews with staff and students of the IDE Faculty, the panel noticed the top-down and bottom-up implementation of procedures. An example of a top-down procedure was the revision of the assessment policy. In 2012, TU Delft conducted a university-wide thematic audit of the assessment policy, in which every faculty participated and discussed the status of their assessment policy. An example of a bottom-up procedure in the IDE-faculty is a restructuring of the master's programmes allowing every master student to have an internship if desired. Reasons for this update were put forward by master programme coordinators, students and the external review committee.

During the audit trail on past performance with EEMCS staff, the panel noted two revisions of the Bachelor's programme of Electrical Engineering in the past period. One revision involved the content of the programme initiated by the faculty itself and another involved the structure of the programme as part of the study success programme (see further below) initiated by the Executive Board. The panel got the impression that, although the initiative of both revisions differed, there was full support and input from staff and students in both cases.

In the past years, TU Delft has especially focused on three education policy themes:

- Study Success Programme;
- Educational developments and innovation;

- Internationalisation.

During the horizontal audit trails, the panel examined the first two themes in more detail. The findings and considerations regarding 'educational developments and innovation' are described in Standard 4 (Development).

In addition to the three policy themes highlighted in the Self Evaluation Report (SER), the panel endeavoured to cover Standard 2 by also focussing on:

- Quality in teaching skills;
- Embedding of professional skills;
- Services and facilities;
- Opportunities for students with a functional limitation.

Study Success Programme

Launched in 2011, the 'Study Success Programme' gives new measures to reduce the average duration of study at bachelor's level and to enhance the educational quality. The reason for this programme was the significantly longer time that TU Delft students take to complete their studies on average compared with the nominal duration of study and with students at other Dutch universities. The Study Success Programme focused on the bachelor's programmes because most significant delays to study progress occurred during the bachelor's phase.

Based on the recommendations of an advisory group (*Naar een bachelordiploma in 4 jaar! Adviesnota maatregelen studiesucces TU Delft, 2011*; in Dutch) and internal discussions, the Executive Board proposed a list of measures. Frameworks containing prescribed preconditions and recommendations were drawn up to make the improvement measures for the bachelors' curricula more concrete (*Koersen op Studiesucces, 2011*; in Dutch). Improvement measures were, for instance, establishing a modular curriculum, adjusting the assessment policy and a better alignment of study load per course with the number of EC.

The SER clearly describes the involvement of teaching and supporting staff and students in the Study Success Programme. The starting point of this programme was a proposal for improvements to their bachelor's degree programme submitted by every faculty. The Mechanical Engineering (ME) programme, for instance, introduced relatively small classes of around 60 students each. Other examples provided during the audit trail were a better introduction to life at the university (including learning how to learn) and the implementation of (/an increase in) formative assessment. Some faculties also introduced a matching procedure before signing up for a study. For example, before entering the Life Sciences & Technology (LST) programme, students must fill in a questionnaire and have a 15-minute face-to-face meeting with a staff member, following which an advice is given.

During the site visit it became clear that academic staff endorsed the urgency of the Study Success Programme; they all felt a shared responsibility. One staff member mentioned: "During the process, there were discussions, but without a reproving atmosphere. We are all on the same side of the table". In addition, staff members also saw opportunities to innovate in the programmes.

Internationalisation

In the Roadmap 2020, TU Delft expresses the ambition to remain a technology university with a leading global reputation. To this end, TU Delft's policy in recent years has focused on increasing the proportion of international students to 10% at bachelor's level and 40% at master's level (*Roadmap 2020*) (*Strategic Plan Internationalisation of*

Education 2014-2020). In 2016, all but one master's degree programme and three bachelor's degree programmes were entirely taught in English and almost 20% of all students were international students. Although a university-wide policy is in place to increase the proportion of international students, there is no target on faculty or programme level. During the site visit the panel noted that if a programme has a good reason to be taught in Dutch, there is sufficient room to do so.

The panel established that at TU Delft internationalisation encompasses more than using English as a medium of instruction in several programmes, and attracting foreign students. In its *Strategic Plan Internationalisation 2014-2020*, 'the university defines internationalisation as the process of integrating the university and its students, faculty and staff into the knowledge and learning system of a rapidly globalising world. In addition to English-taught education and an international study population, TU Delft participates in education programmes with international partners and offers open and online education.

Quality in teaching skills

One of the performance agreements with the Ministry of Education, Culture and Science (OCW) concerns the University Teaching Qualification (UTQ; in Dutch: Basiskwalificatie onderwijs, BKO). In addition to the UTQ, TU Delft offers English language courses. The minimum level of English language skills required to teach a master's degree programme has been set at C1: high. However, the students the panel met during the site visit, were only partly satisfied by the English proficiency of their teachers. An important factor of this dissatisfaction was due to the level of pronunciation, which remained unsatisfactory despite a proper mastery of the English vocabulary.

By the end of 2015, 72% of the academic staff had obtained a UTQ or UTQ equivalent. The panel spoke to academic staff members about the teaching qualification courses. Most staff members were in favour of the introduction of the UTQ and acknowledged the benefits. However, the panel also established that hardly any academic staff had obtained a senior teaching qualification. It seems that this qualification can only be obtained via Erasmus University Rotterdam.

With regard to teaching skills, the university is acquainted with two policy documents: '*Continu ontwikkelen van de onderwijskennis en -vaardigheden van wetenschappelijk personeel, 2015*' and '*Onderwijs in de wetenschappelijke loopbaan, 2015*' (both in Dutch). According to the first document, intrinsic motivation of teachers to develop their educational knowledge and skills is an important spearhead within TU Delft's policy of 'continuous development'. The second document provides an outline of the measures taken to ensure the attention and appreciation of education within the academic career. For instance, the panel established that when filling academic vacancies, candidates are required to give a trial lecture as part of the selection process.

Embedding of professional skills

As clearly outlined in the vision on education, TU Delft's students are trained to apply and integrate knowledge and skills in interdisciplinary tasks and to cooperate with others to execute multidisciplinary tasks. During the site visit, the panel asked questions regarding to what extent professional skills are embedded in the curriculum. It noted that, for instance, the topic of ethics has been introduced into and further reinforced in several bachelor's and master's programmes. However, students of several faculties mentioned that professional skills are mainly part of extracurricular activities, such as study associations, student councils and DreamTeams. The alumni

were also of the opinion that there could be a stronger focus on the training of professional skills in the regular programmes.

Services and facilities

TU Delft provides a broad range of support services that strengthen the institution's educational ambitions. With regard to educational quality assurance, the university is supported by the Department of E&SA. E&SA facilitates the education provided by the university by preparing and implementing education policy, carrying out the necessary educational administration, and offering a range of support activities for students and lecturers. During the audit trail on past performance, E&SA staff explained its responsibility for the formal evaluations and its involvement in organising meetings to further deliberate on the topics of the evaluations. E&SA takes the lead in this process if necessary.

Currently, the campus is being thoroughly remodelled. In 2013, TU Delft completed a Campus Vision (*TU Delft Campusvisie, 2013*; in Dutch) that described a renewal of the campus with a focus on sustainability and the improved utilisation of the existing spaces. The investments target the quality of spaces for new forms of education and research.

This vision was translated into a multi-year plan for renovating existing classrooms and constructing new ones (*Roadmap Onderwijsruimtes, 2014*; in Dutch). Due to a higher than predicted student intake, in 2014 it was decided to construct an additional teaching building, called PULSE, which will be ready in 2018. Pending the delivery of the PULSE building, two halls in the former Army museum were converted into classrooms.

Opportunities for students with a functional limitation

One recommendation by the 2011 audit panel was to implement structural measures for students with disabilities. At TU Delft, 11% to 14% of students have a functional impairment. The 2009 policy document (*Beleidsnotitie studeren met een functiebeperking*; in Dutch) on this topic was evaluated in 2016.

During the site visit the panel spoke with four students with a functional impairment. They were pleased with the student counsellor, who proved very approachable. In their opinion, help is mostly given on an individual basis. Two of these students participate in an advisory group that is involved in solving practical issues, but not in policy making.

The panel also learned about different issues that students face. Examples include the inability to make efficient use of extra time given to complete an examination because of loud noises made by other students who leave the classroom after the regular examination time, and the considerable amount of bureaucracy especially when doing a minor at another university.

Considerations

The panel acknowledged that the accreditation record at programme level of TU Delft is impressive. Based on the university's positive track record, the panel is confident that TU Delft has processes in place for the quality assurance of its programmes. It strikes the panel in a positive way that the institute was pleased with this positive track record, but also expressed the ambition that it needs to do better. In order to become a world-class university in terms of both research and education, the university would benefit from more 'good' or 'excellent' accreditations.

TU Delft follows an effective process to develop its policies, in which it uses both top-down and bottom-up procedures. The panel confirmed that, overall, policies are well implemented. It was truly impressed by the collegial and open atmosphere in which policies were implemented. According to the panel, it is commendable that staff members are very up to date and know their part in these policies.

The panel applauds the room given to the faculties and programmes for the implementation of the university policies. Both with the implementation of the Study Success Programme and the internationalisation strategy, the faculties made good use of their autonomy to implement the policy and make it fit for purpose. During the site visit, the panel saw several very good implementation initiatives at faculty level. Although first steps are taken in sharing these good practices between faculties, it is not yet a systematic element in the internal quality control system. The panel recommends keeping a close eye on situations where faculties are lagging behind and where support from others could be useful.

The panel finds the Study Success Programme to be an illustrative example of implementation of policy throughout the whole university. The panel especially valued the shared responsibility that was expressed during the audit trail. In its opinion, this clearly demonstrates that the staff co-owns this policy and is committed to its realisation. In this programme, the panel noticed a wide variety of measures that has been implemented. During the audit trail the panel got insight into the different creative and innovative approaches that were developed to improve the bachelor's programme. The panel understands the choice of the university to start the Study Success Programme in the bachelor's programmes, but is pleased to see that in further implementation, the university will focus more on the master's programmes.

With regard to internationalisation, the panel was satisfied with the implementation of the *Strategic Plan Internationalisation of Education 2014-2020*. It is of the opinion that this strategy fits well in the university's ambition to promote TU Delft's reputation as a technology university with a leading global reputation. The panel agrees with the university that care should be taken in the further implementation of the internationalisation strategy. It suggests ensuring that the quality of education is not endangered due, for example, to the English proficiency of lecturers or the workload of teachers to provide all material in English. To increase the integration of international students and staff, it is recommended encouraging them to actively participate in Boards of Studies and other associations. Furthermore, the main policy documents should also be available in English.

The university has made considerable progress in the field of teaching skills. The goal of ensuring that 70% of teaching staff achieved a UTQ in 2015 - one of the performance indicators agreed with the Ministry of OCW - proved challenging for some faculties. Although all faculties achieved this target, the panel expects the university to take this to the next level. It is of the opinion that teachers must keep taking teaching courses throughout their entire academic career. It therefore recommends offering flexible trajectories in order to give teachers the opportunity to specify their own path to improve their teaching skills tailored to their specific needs. In addition, it suggests that the university offers an in-house senior qualification trajectory.

The panel established that the development of professional skills primarily occurs in special programmes that are only open to a limited number of students, like honours programmes, DreamTeams or activities organised by students. It suggests that the university brings these activities closer to the study programmes, so that a larger number of students can develop these skills.

The growing student population has also put a strain on the facilities of TU Delft. Students indicated that the present situation puts pressure on study spaces for students and laboratories that are stretched above their limit. At the same time, the university is taking adequate steps to address the consequences of this growth by further investments in facilities.

In the panel's opinion, policy on accessibility and feasibility of education for students with a functional impairment deserves more systematic attention. Although the panel noticed that the university is willing to help at an individual level, it still struggles with the implementation of central policies. The panel recognises the dilemma of offering clear and explicit help and the negative effect of possible stigmatisation.

Judgement

TU Delft meets Standard 2, Implementation.

4.3 Evaluation and monitoring

Standard 3 – The institution systematically evaluates whether the intended policy objectives relating to educational quality are achieved. Relevant stakeholders are involved in this process.

Findings

The Executive Board has various instruments to systematically evaluate and monitor the quality of teaching and the realisation of its education policy. As explained in Standard 1,

TU Delft makes use of the Educational Quality Assurance Plan that comprises a number of these instruments (*Onderwijskwaliteitsplan, TU Delft, 2009*). The plan provides a set of rules, guidelines and procedures for the faculties to set up their own quality assurance system and make it fit for purpose.

First, TU Delft operates a Planning and Evaluation Cycle (P&E cycle) for developing strategic plans, and conducting monitoring and evaluation. The core of the P&E cycle consists of administrative consultation between the Executive Board and the faculties represented by the Dean, the management team and the secretary of the university. The institutional plan and the faculty multi-annual plans provide the framework for these discussions. The results of the dialogue are laid down in administrative agreements on the objectives to be realised.

Second, TU Delft systematically generates management information. As required by the Ministry of OCW, a number of objectives have been formulated in the performance agreements. Most of these key performance indicators relate to the quality of education and student success rates. As well as key performance indicators agreed with the Ministry of OCW, TU Delft also uses administrative indicators defined internally to monitor progress towards its strategic objectives for 2015 and 2020. Faculties are requested to set targets relating to these indicators. The most recent faculty target values for the indicators are reported in every P&E cycle meeting. Both students and staff have access to management information on education via TU Delft's intranet.

Lastly, there is the system of quality measurements in the form of audits. Before the external accreditation process takes place, a thorough internal process is conducted comprising three internal assessment committees that oversee specific educational

activities: minor programmes, joint education and post-initial education. The procedures for a new degree programme are outlined in a script (*Draaiboek nieuwe BSc-MSc opleidingen TU Delft faculteit, 2014*; in Dutch). In between external assessment procedures, internal mid-term audits take place both at institutional and programme level.

In addition to degree programme assessment, TU Delft conducted two thematic audits. The first audit involved the assessment policy, in response to a recommendation of the 2011 audit panel. It stated that the implementation of the main guidelines with regard to the assessment policy and the role of the Boards of Examiners at faculty level should be accelerated. This thematic audit resulted in recommendations for faculties to improve their assessment policy.

The second thematic audit was conducted in 2016 and evaluated the Study Success Programme (*Onderwijssucces, van structuur naar cultuur, 2016*; in Dutch). The evaluation was based on faculty self-reflections, discussions with representatives of the bachelor's degree programmes and discussions with students. Overall, the faculties were satisfied with the revision of the structure of the bachelor's programmes. Although the proportion of students who received a positive binding recommendation on the continuation of studies (Bindend Studieadvies, BSA) at the end of their first year remained approximately the same compared with the preceding three years, the number of students who abandoned their studies before 1 February, thereby not receiving a BSA, increased in recent years. Based on the results of the audit, the evaluation committee made fifteen recommendations. In general, it stated that the good transformation begun in the Study Success Programme should be continued and kept on the agenda. However, the focus should shift from structure and organisation to didactics and culture with required support for lecturers and supporting staff, and continued investment in dialogue between students and staff.

In addition to a thematic audit of the Study Success Programme, at the request of the Central Student Council (*Centrale Studentenraad, 2013*; in Dutch), a limited evaluation of the programme took place shortly after its implementation. Reasons for this request were concerns about the increased number of interim assessments, deviations from the TU Delft annual timetable and an increased number of student obligations.

According to the students whom the panel spoke with, evaluations at course level are the most important measures of quality. The university uses a set of standard factors for course evaluations (study load, course material, relevance of preliminary knowledge, relevance of subject for the degree programme, organisation/logistics, examination, and English language proficiency). In addition to this evaluation system, in several faculties, Student Councils, student associations or staff involved in the course, organise their own evaluations. These consist of questionnaires and meetings with students. As mentioned during the trail on past performance, students of the Board of Studies, Student Council and study association of the IDE faculty introduced for example an 'orange-card system', in which every student could write down his complaints and suggestions on an orange card. These serve as input for improvements to the curriculum. Additionally, the students are given the option to receive feedback on what is done with their comments.

The panel noticed a large student involvement in the quality assurance of education. Their input is heard through the various decisional bodies. The examples above show a clear picture of the role of the Student Council, but study associations also play an important role. In the meetings with the panel, students confirmed that the culture at Delft is very egalitarian, which makes staff and Board very approachable. Students

also value the way in which the university handles their feedback on the quality of their education.

In the 2011 audit, the panel recommended TU Delft engaging the professional field in a more structured way. Although a specific policy was not apparent, the panel observed some good examples of a structural link with the professional field. For example, the IDE faculty appointed part-time professors who combine their work with the professional practice of industrial design engineering. In addition, most faculties have established a 'professional field' committee. During the site visit, the panel did not observe a large involvement of the alumni in the programmes.

The panel witnessed that the Supervisory Board brings a strong contribution to the university due to their intensive contact with the Executive Board, but spends limited effort on monitoring the quality on decentral parts of the organisation.

Considerations

The panel appreciates the broad range of instruments TU Delft uses to measure the results of its policies and the quality of its programmes. In its opinion, it is a good combination of hard and soft controls, well embedded in the institution. TU Delft established a close-knit system with a delicate balance between quantitative performance indicators on the one hand (with a half-yearly P&E cycle) and, on the other hand, actual discussions about quality at faculty level. The panel values the transparency of the data and noticed that in certain faculties, the educational dashboards are available to all staff and students.

During the site visit, the panel was presented a list of TU Delft's key performance indicators and intern administrative indicators. The panel was impressed by the wealth of data that the university collects. Although these data show a clear picture on the state of play, the panel considers that data and their analysis are not always exploited to the utmost. It advises the university to focus less on too detailed data, but rather to invest in formulating and analysing indicators that focus on the quality of education and main strategic developments.

The panel noted with satisfaction that there is a large involvement of students in discussions and decisions about quality and quality assurance. The example of the interim evaluation of the Study Success Programme shows the large influence that the Student Council has on quality assurance. The panel applauds the pro-active role of students in the evaluation and improvement of the quality of programmes.

According to the panel, the most important output of a university is certainly its high-quality graduates; they will have the largest impact on society and the economy over the years. To confirm the quality of the educational programmes, the panel recommends investing more in following up with its graduates. This is the most reliable indicator of the quality of education at TU Delft. In addition, the panel is of the opinion that the involvement of alumni in the programmes can be improved, for example, by involving them in teaching activities to strengthen the relationship with the professional field. Although the Executive Board mentioned that this topic is on the agenda, the panel encourages TU Delft to increase its efforts and accelerate this process.

Judgement

TU Delft meets Standard 3, Evaluation and monitoring.

4.4 Development

Standard 4 – The institution has a focus on development and works systematically on the improvement of its education.

Findings

As mentioned in Standard 3, guidelines and procedures for the quality assurance system are outlined in the Educational Quality Assurance Plan. The cyclical quality assurance system described in this plan is divided into 'quality definition', 'quality assessment', 'analysis' and 'quality improvement'. This cycle helps to ensure that points for improvement are systematically identified, agreements are made concerning implementation and the results and effects of these improvements are measured, and where necessary modified.

In the P&E cycle, the spring consultation looks back on the results and achievements of the past year and looks forward to the faculty strategies regarding a number of current topics. The autumn consultation focuses on the faculty budgets and associated operational plans for the coming year. During these meetings, the university makes use of the management information as explained in Standard 3.

The panel established multiple formal and informal loops at several levels in the university that make the quality system work well. An example of a closing loop in quality assurance is the outcome of the National Student Surveys (*in Dutch: Nationale Studenten Enquête, NSE*). According to the SER, in the NSE of 2013 and 2014, students generally awarded TU Delft lower scores on indicators relating to the quality of teachers and lecturers than students from other universities in the Netherlands. Because of this disappointing result, special meetings with students were organised to establish the underlying reasons. This resulted in an action plan that incorporates various measures such as increasing the recognition and appreciation of teaching by awarding teaching prizes.

At the programme level, evaluations of courses are widely disseminated and discussed in the Board of Studies. During the site visit, the panel observed a meeting of the Board of Studies of the Bachelor's and Master's programmes in Applied Mathematics, in which a course evaluation was on the agenda. Following talks with members of several Boards of Studies, the panel established that these boards are well aware of their changing role as a result of recent new legislation. They define their expected role as 'proactive' and 'giving unrequested advice'.

A telling example of a closing loop on a programme level is the revision of the inter-faculty Master's programme in Sustainable Energy Technology. The panel of the midterm review had major concerns about the discrepancy between students' expectations and the curriculum. The Director of Studies was tasked by the Executive Board to make a short-term improvement plan and more structural changes for the longer term. At this moment, a new coordinating faculty has been designated. The new curriculum will start in September 2017.

Educational developments and innovation

Over the last three years, TU Delft has taken significant steps in developing and delivering open and online education. As a result of insights into the online student population, and in line with its mission, TU Delft strives to offer an increasingly diverse

online course portfolio to support and satisfy the curiosity, personal growth, lifelong learning and professional career development of thousands of people. TU Delft distinguishes four types of online education: Massive Online Open Courses (MOOCs), professional education, online academic courses and OpenCourseWare (OCW), which is run within the Extension School. The university now runs 64 MOOCs, 16 online academic courses and 25 professional education courses online. In the next phase of open and online education it will contribute to a growing academic output and improving the quality of both campus and online education (*The Next Phase of Open & Online Education, 2014*).

In a horizontal audit trail, the panel investigated the implementation of educational developments and innovation. An Extension School was established in support of the latest educational developments. An E-Dean appointed by the faculties is in charge of the school. The trail made clear that the university used a bottom-up approach to engage its staff members: individual staff members take the lead – they are invited to submit project proposals – and the school facilitates the various initiatives. All concerned – staff, faculties, and Executive Board – felt that this approach was helpful in generating support for educational change.

During the audit trail, the panel learned that the resources that teachers developed for open and online education are also used in TU Delft's regular study programmes. Many of the teachers engaged in online education do so to the benefit of their personal experience and of the regular study programmes by using part of the online material for illustration, or using it for blended learning. Both academic staff and students stated that they value the variety of teaching methods, in particular the introduction of blended learning.

In addition to the development of open and online learning, the university innovated in education by establishing networks in education with partner universities, such as the Centre for Engineering Education (4TU.CEE, network of TU Delft, Eindhoven University of Technology, University of Twente and Wageningen University) with the objective of collating, developing, implementing and sharing current expertise in engineering education. Another example is the Centre for Education and Learning (LDE.CEL), a regional network of TU Delft, Leiden University and Erasmus University Rotterdam.

The Delft Teaching Academy will be launched in September 2017. It will provide support for lecturers and create a testing environment in which lecturers can work on educational developments and innovation. The university has already appointed eight 'Education Fellows'. It was explained that four Fellowship positions are awarded each year to lecturers who make a substantial and valuable contribution towards teaching. The Education Fellow is expected to work on an educational project during a period of two years. In addition, an Education Fellow performs an ambassadorial role within the university. The group of fellows that the panel spoke to were very enthusiastic about the given opportunity. In their opinion, it illustrates that education is taken seriously at TU Delft.

Considerations

The panel is convinced that TU Delft has developed both the necessary procedures and the adequate tools to continuously improve the quality of its programmes. In its opinion, the university not only acts in response to evaluation of data but also acts promptly and constructively on issues raised at all levels throughout the university.

As extensively described in Standard 3, TU Delft has several measures in place to assure the quality of its education. These include administrative and performance indicators, but also qualitative measures with regard to work load, engagement of the professional field, and research. In the panel's opinion, an opportunity for the university is to better combine these data and funnel it back to strategic decisions. This can be the case, for instance, for the use of innovations in educational quality or for managing the growing student population.

The panel is impressed by the open and online education initiative, which, according to the panel, can be considered as world-class. The panel also values the way educational developments are implemented at TU Delft. With the bottom-up approach whereby the initiative is left to the staff, the acceptance and support of the staff is high. This approach also fits in the Delft culture of sharing responsibilities and working extensively in a community mode. The panel endorses in this regard a comment by one of the staff members during the site visit: 'peer pressure is better than Executive Board pressure'. A challenge for the future is to search for a healthy mix between online education and campus educational activities. The university may consider evaluating the use and mix of online and campus education to find the 'proper' blend.

The panel commends the appointment of Education Fellows and their impact on the quality of the teaching and learning process. In the panel's opinion, this group puts education on the agenda. It established that the approach of 'learning from each other' is highly appreciated at TU Delft. The fellows share their experiences with other staff members at TU Delft via workshops that are organised on Education Day. In addition, the university may consider using in the future, the group of (former) Educational Fellows as a resource (advisory group) at university level for driving educational development and cross-fertilisation between faculties. Input from this group could be very valuable for the upcoming Strategic Plan 2018-2024 and the sharing of educational best practices throughout the university.

Judgement

TU Delft meets Standard 4, Development.

4.5 Final conclusion

The panel has taken cognisance of TU Delft's internal quality assurance system. It established that the university fosters a culture of innovation and experimentation in teaching and learning. TU Delft recently developed a new vision on education that is broadly supported by all stakeholders. Policies are well implemented via top-down and bottom-up procedures. Various tools are used to evaluate and monitor quality assurance and an active and systematic policy is pursued to improve the quality of its programmes.

The panel is impressed by the convincing way in which TU Delft has shown to be in charge of educational quality assurance. The institution adopts a consistent policy based on a clear vision, and implements further policies where necessary. It does this on substantive grounds and in close consultation with internal and external stakeholders. The panel especially valued the shared responsibility that was expressed by many interlocutors during the visit. According to both the university and the panel, the main strategic challenge lies in the growing student population. To safeguard the quality of education, the panel recommends using the upcoming Strategic Plan 2018-2024 to develop a clear university strategy with respect to this topic, thereby taking into account all aspects that are related to this issue, such as diversity and work load.

As TU Delft meets all four standards of the framework for institutional audits, the panel's final conclusion is positive in accordance with the NVAO assessment rules.

4.6 Recommendations

The panel makes the following recommendations for further consideration by the institution as discussed during the audit:

1. Growing student population

To safeguard the highest possible quality of education, the panel recommends using the upcoming Strategic Plan 2018-2024 to develop a clear university wide strategy to cope with the increasing growth of the student population. This strategy should recognise the sense of urgency and incorporate the consequences of various aspects, like internationalisation, study spaces and laboratory facilities, staff capacity, workload, healthy work/personal life balance, diversity, balance in gender, housing capacity for students and connection between research and education as well as a healthy balance between the two. TU Delft can make good use of (results and energy of) the Study Success Programme and the education development and innovation programme in formulating this policy.

2. Efficient and effective decision making

The panel recommends analysing the effectiveness and the efficiency of the internal decision making processes, with a particular focus on reducing the implementation time. Allowing the faculties and programmes ample room to implement the university policy is commendable, but it is equally important to closely monitor situations where the faculties are lagging behind and could use help from others. Decision-making on new initiatives and innovation activities take time. Once enough support is garnered, the university should not hesitate to take top-down decisions, and formulate clear policy measures and steer accurately on them.

3. Educational skills

The panel recommends maintaining a permanent focus on and investing in didactic lifelong learning for academic staff, through additional instruments such as an in-house provision for the Senior Teaching Qualification and Educational leadership programmes. The Delft Teaching Academy can play a key role in the further development of educational skills. It is also advisable to make educational courses more intensive and personalised, for instance via a "menu" from which a number of training topics can be chosen.

4. Alumni

The panel recommends developing a closer relationship with the alumni, for various reasons, and monitoring progress made in terms of measurable outcomes. First, the placement of alumni in the professional field and PhD-programmes of prestigious universities worldwide and their subsequent career track might serve as the most reliable indicator of the quality of education at TU Delft. It would be worthwhile to include this in the quality information system. Second, the university can provide lifelong learning activities to alumni through Extension School activities in a more systematic and consistent manner. Third, the contribution of alumni and the professional field at large in the quality assurance of individual programmes can be enhanced. Lastly, a professional Alumni Association in which a number of outstanding alumni are willing to take responsibility can play a prominent role in branding TU Delft as a world-class university.

5. Educational development

The panel recommends developing an integrated policy with respect to educational development, in view of the challenges for the future. TU Delft can build on the high-quality initiatives that were already taken over the last ten years with respect to blended learning and on-line education. Given the investment of significant resources in the past and the enthusiasm of teaching staff regarding this type of innovative education development, TU Delft has a good base to define this integrated policy. The university should aspire for a healthy mix between online education and campus educational activities and could consider the group of (former) Educational Fellows as a resource at university level for driving educational development and cross-fertilisation between faculties. Input from this group could be very valuable for the upcoming Strategic Plan 2018-2024 and the sharing of educational best practices throughout the university.

6. Target of excellence

The panel recommends inviting all faculties to define one or two national or international benchmarks for their educational programmes, and to use those in the evaluation of programmes in midterm reviews. TU Delft can make good use of its network of world-class partner institutions. In doing so the university can make the high-quality level of its education programmes more visible. It would also be in line with its ambition towards excellence.

Appendix 1 – Panel

Professor Frank van der Duijn Schouten, Dean of the Faculty of Philosophy, Erasmus University Rotterdam, former Rector of Tilburg University and VU Amsterdam, and Professor Emeritus in Mathematics of Operations Research, Netherlands (chair)

Frank van der Duijn Schouten studied mathematics and physics at the Vrije Universiteit in Amsterdam. He received his PhD degree in mathematics from the University of Leiden in 1979. In 1987, he was appointed professor of mathematical decision making at Tilburg University. From 1999 to 2008 he led this University as a rector magnificus. He served the Vrije Universiteit as rector magnificus from 2013-2015. He was guest researcher at Bell Labs (US), INSEAD (Paris) and at the universities of Berkeley and Haifa. He was General Manager of Netspar, vice-chairman of the Dutch National Educational Council, member of the NWO Social Affairs and Management Sciences Board, Chair of the Supervisory Board of the Protestant Theological University, Chair of the Supervisory Board of Fontys University of Applied Sciences and Board member of the Supervisory Board of Publishing Company Jongbloed BV.

Professor Inger Askehave PhD, Pro-rector of Education, Aalborg University, Denmark

Inger Askehave holds a MA in English and International Relations from Aalborg University and a PhD in Business Communication from the Aarhus School of Business, Denmark. From 1 December 2000 until 31 July 2004 she was Associate Professor at Aarhus School of Business. From 1 August 2004 until 31 January 2006 she was Associate Professor at Aalborg University. From 1 February until 31 December 2009 she was Head of Department at Aalborg University. On 1 March 2009, she was appointed professor in professional communication at Aalborg University. In 2010, she was appointed pro-rector at Aalborg University (since 2016 pro-rector for education).

Professor Clement Fortin PhD, Associate-Provost and Dean of Faculty, Skoltech (Skolkovo Institute of Science and Technology), Moscow, Russia; Professor Emeritus, Ecole Polytechnique, Montreal, and former President and CEO, Consortium for Research and Innovation for Aerospace (CRIAQ), Quebec, Canada

Clement Fortin has been the Director of the Department of Mechanical Engineering at École Polytechnique de Montréal from 2005 until 2010 and a professor in this institution since 1987. In his research work, Clement Fortin has worked extensively with students and research staff in the field of advanced manufacturing and Product Lifecycle Management (PLM). In June 2015, he was awarded the status of Professor Emeritus for his exceptional contributions to Polytechnique Montréal. From 2010 until 2014, Clement Fortin was President and Chief Executive Officer of the Consortium for Research and Innovation for Aerospace in Quebec (CRIAQ). From 2014, he is professor of the practice, Associate Provost, Dean of Faculty and Postdoctoral Affairs at the Skoltech Faculty.

Ir. Peter Struik, General director Sustainability and Environment, Rijkswaterstaat, Utrecht, Netherlands

Peter Struik is a board member at Rijkswaterstaat, portfolio of Knowledge and Quality. Until 27 February 2017 he was Chief Engineer-Director of the Water, Traffic and Living Environment Department. In these roles, he elaborates on Rijkswaterstaat's content-strategic management through a leading Network Management Vision and through to performance management and quality assurance. From 1 March 2017, he is Quarter

Maker and Chief Engineering-Director of the new Rijkswaterstaat programme Sustainability and Living Environment.

Lennart van Doremalen MSc, PhD candidate in Subatomic Physics, Utrecht University, Netherlands (student member)

Lennart van Doremalen is a PhD candidate at the institute of Subatomic Physics at Utrecht University. He studied the research master 'Experimental Physics' and the bachelor 'Physics and Astronomy' at the same university. During his studies, he was co-founder of the student party Lijst Helder and student representative for this party in UU's University Council. From 2009 until 2010 he was the student board member of the Department of Physics. In 2012, he organised the International Conference of Physics Students (ICPS) in collaboration with fellow students. In addition, Lennart was an active member of the national student union LSVb, the local student union VIDUIS, and fulfilled several functions as board member or advisor next to his studies. He is also co-founder of the Utrecht municipality council party Student & Starter.

The panel is assisted by:

- Annemarie Venemans-Jellema PhD, secretary;
- Michèle Wera MA, NVAO process coordinator.

All panel members and the secretary have filled in and signed a declaration of independence and confidentiality.

Appendix 2 – Accreditation Record

This document gives an overview of the accreditation outcomes of all 45 applications that Delft University of Technology submitted over the period 2011-2016. The accreditation record (or 'portrait') shows the results as they have been retrieved from NVAO's documentation and information system. The data have also been verified by the university.

The data presented are based on the accreditation decisions and the underlying external assessment and advisory reports. The NVAO framework for limited assessments of programmes is applicable for Delft University of Technology given the positive outcome of the institutional audit in 2011. The programme assessment focuses on the following quality standards: the intended and achieved learning outcomes, the teaching and learning environment, and the students' assessment. The existing programmes are usually assessed within an assessment group by expert panels approved by NVAO. Expert panels convened by NVAO peer review the new programmes. All panels are assisted by secretaries trained by NVAO.

All the applications for accreditation submitted by Delft University of Technology in the period under review have resulted in positive accreditation decisions. The accreditation record for the 2011 institutional audit showed comparable outcomes.

Panels judge the quality of an existing programme on a four-point scale: unsatisfactory, satisfactory, good or excellent. New programmes and until 2012 also existing programmes are assessed as either positive or negative. One in three programmes is assessed as good, the majority being masters; the remainder is assessed as satisfactory. In addition, four new programmes were accredited including three joint degree programmes.

Annex 1 gives an overview of the NVAO decisions and the final judgements. Annex 2 lists all programmes including the final judgements, and differentiating between existing and new programmes.

The Hague, 22 March 2017

ANNEX 1

Delft University of Technology	
Accreditation	41
Initial Accreditation	4
Total	45

Delft University of Technology					
	<i>Year NVAO Decision</i>	<i>Good</i>	<i>Satisfactory</i>	<i>Positive</i>	<i>Total</i>
Accreditation	2012 ³			5	5
	2013	5	17		22
	2014	5	8		13
	2016		1		1
Initial Accreditation ¹	2012 ¹			1	1
	2014			2	2
	2015			1	1
Total		10	26	9	45

³ Two point scale: positive or negative

ANNEX 2

Delft University of Technology				
NVAO Decision		Accreditation of Existing Programmes, Bachelor or Master		
2012 ¹	1	M Embedded Systems		positive
	2	B Electrical Engineering		positive
	3	M Electrical Engineering		positive
	4	M Computer Engineering		positive
	5	M Sustainable Energy Technology		positive
2013	6	B Bouwkunde (Architecture, Urbanism and Building Sciences)		satisfactory
	7	B Civiele Techniek (Civil Engineering)	good	
	8	B Life Science and Technology (joint degree Leiden)		satisfactory
	9	B Maritieme Techniek (Marine Technology)		satisfactory
	10	B Molecular Science and Technology (joint degree Leiden)		satisfactory
	11	B Technische Aardwetenschappen (Applied Earth Sciences)		satisfactory
	12	B Werktuigbouwkunde (Mechanical Engineering)		satisfactory
	13	M Applied Earth Sciences		satisfactory
	14	M Architecture, Urbanism and Building Sciences		satisfactory
	15	M Biomedical Engineering		satisfactory
	16	M Chemical Engineering		satisfactory
	17	M Civil Engineering	good	
	18	M Construction Management and Engineering		satisfactory
	19	M Geomatics		satisfactory
	20	M Life Science and Technology		satisfactory
	21	M Marine Technology	good	
	22	M Materials Science and Engineering		satisfactory
	23	M Mechanical Engineering	good	
	24	M Offshore and Dredging Engineering	good	
	25	M Science Education and Communication		satisfactory
26	M Systems and Control		satisfactory	
27	M Transport, Infrastructure and Logistics		satisfactory	
2014	28	B Industrieel Ontwerpen (Industrial Design)	good	
	29	B Luchtvaart- en Ruimtevaarttechniek (Aerospace Engineering)		satisfactory
	30	B Technische Informatica (Computer Science and Engineering)		satisfactory
	31	B Technische Natuurkunde (Applied Physics)		satisfactory
	32	B Technische Wiskunde (Applied Mathematics)		satisfactory
	33	M Aerospace Engineering		satisfactory
	34	M Applied Mathematics		satisfactory
	35	M Applied Physics		satisfactory
	36	M Computer Science	good	
	37	M Design for Interaction	good	
	38	M European Postgraduate Masters in Urbanism		satisfactory
	39	M Integrated Product Design	good	
	40	M Strategic Product Design	good	
2016	41	M Industrial Ecology (joint degree, Leiden)		satisfactory

Delft University of Technology			
<i>NVAO Decision</i> 1		<i>Initial Accreditation of New Programmes, Bachelor or Master</i>	
2012	1	B Nanobiology (joint degree Rotterdam)	positive
2014	2	B Klinische Technologie (Clinical Technology; joint degree Leiden, Rotterdam)	positive
	3	M Berlage Master in Architecture and Urban Design	positive
2015	4	M Nanobiology (joint degree Rotterdam)	positive

Appendix 3 – Visit Programme

Day 1 – Monday 15 May 2017

- 12.00-15.00 Lunch and preparatory panel meeting
- 15.00-15.45 Greet and Meet
- 15.45-16.30 Executive Board
- Tim van der Hagen (President)
 - Karel Luyben (RM)
 - Anka Mulder (VPEO)
- 16.45-18.00 Standard 1: Vision and Policy
- Anka Mulder (VPEO)
 - Peter Russell (Dean A)
 - Hans Hellendoorn (DO 3mE)
 - Timo Kos (director E&SA)
 - Cor Kraaikamp (OR, also staff EEMCS)
 - Josephine Dumas (SR, also student BSc KT)
 - Philip van den Heuvel (student EEMCS)
 - Axelle Vire (staff AE)
 - Erik Oostwegel (CEO Royal HaskoningDHV; Advisory Board DIMI)
- 18.15-19.00 Supervisory Board
- Douwe Breimer
 - Carolien Gehrels
- Both members of committee Quality Assurance Education and Research*
- 19.30-20.30 Open consultations with stakeholders

Day 2 – Tuesday 16 May 2017

- 08.15-09.15 Breakfast with students
- Timo Oosterveer (BSc KT)
 - Toon Jansen (BSc TB)
 - Evita Goettsch (BSc IO)
 - Adrienne Kaźmierczak (MSc S&C)
 - Conno Kuyt (MSc ME)
 - Sylvia Fernández Gelonch (MSc MoT)
 - Kasper Spoelstra (MSc NB)
 - Fabbio Hu (MSc AE)
 - Máté Erdős (MSc CE)
 - Anna Golubovska (MSc AUBS)
 - Marcos Salvador Jerez (MSc AE – EWEM joint programme)
 - Rutger van de Lagemaat (MSc SET)
 - Elvan Kula (MSc CS)
 - Marie Sam Rutten (BSc TB)
- 09.15-10.15 Panel meeting
- 10.15-11.30 Standard 2: Implementation
- Theun Baller (Dean 3mE)

- Hans Tonino (DO EEMCS)
 - Theo van Drunen (head of faculty E&SA, A)
 - Ellard Volmer (SR, also student BSc TB)
 - Nelson Mota (Staff A)
 - Vincent Brugemann (staff AE)
 - Mark de Bruijne (staff TPM)
- 11.45-13.00 Standard 3: Evaluation and Monitoring
- Peter Wieringa (conrector)
 - Jan Schoormans (DO IDE)
 - Margot Guurink (SR, student BSc LST)
 - Judith de Kruijff (OKZ 3mE)
 - Julien van Campen (staff AE, MSc AE Track coordinator)
 - Sander van Otte (BoS chairman AP (AS))
 - Elsemiek Smilde (Commissioner BSc at Study Association Curius TPM; student BSc TB)
 - Sander Steenbrink (Boskalis, chairman "beroepenveldcommissie" WB)
- 14.30-15.45 Standard 4: Development
- Aldert Kamp (DO AE)
 - Ernst ten Heuvelhof (DO TPM)
 - Josephine Dumas (SR, also student BSc KT)
 - Maaïke Swarte (OR, staff AS)
 - Annoesjka Cabo (OD interfaculty education EEMCS)
 - Leon Teunissen (Dubbel L, advisory council Management of the Built environment, A)
 - Arno Smets (staff EEMCS; Board of Examiners)
- 16.00-17.00 Deans and Executive Board
- Theun Baller (Dean 3mE)
 - Peter Russell (Dean A)
 - Lucas van Vliet (Dean AS)
 - Bert Geerken (Dean CEG)
 - Ena Voûte (Dean IDE)
 - John Schmitz (Dean EEMCS)
 - Tim van der Hagen (President)
 - Anka Mulder (VPEO)
- 17.00-18.30 Panel meeting

Day 3 – Wednesday 17 May 2017

- 08.30-09.00 Executive Board and/or representatives
- Tim van der Hagen (President)
 - Karel Luyben (RM)
 - Anka Mulder (VPEO)
 - Linda Verbeek (Policy Advisor E&SA)

Audit trail 1: past performance internal quality assurance

- 09.00-10.00 Panel meeting
- 10.00-10.30 Management: Dean, study programme director(s) and others
- Ena Voûte (Dean)
 - Jan Schoormans (DO)
 - Ellen Bos (head E&SA)
 - Sylvia Mooij (BSc coordinator)
 - Arjen Jansen (MSc coordinator IPD)
 - Daan Picavet (student member Board of Education)
- 10.45-11.30 Staff
- Silje Dehli (academic staff en chairman BoS)
 - Pieter Jan Stappers (academic staff)
 - Armagan Albayrak (academic staff)
 - Bas Flipsen (academic staff)
 - Ingrid Mulder (academic staff)
 - Nel Pouw (educational adviser/manager quality assurance)
 - Astrid Smoorenburg (student assistant Quality assurance)
 - Anouk Erdkamp (Commissioner Education Study Association)
- 11.45-12.30 Students
- Emma Schalkers (chairman FSC; MSc student SPD)
 - Claudia Spaargaren (Board of Studies member, MSc student Dfl)
 - Timo Dijkstra (Board of Studies member, MSc student IPD)
 - Avelien Husen (BSc student, 2nd year)
 - Eva Oosterlaken (BSc student, 3th year)
 - Lodewijk Rauwenhoff (BSc student, 3th year)
 - Iris Hendriksen
- 12.45-13.15 Alumni
- Rolf Bossert (alumnus and chairmen OAC)
 - Kaila Vreeken (alumnus Dfl)
 - Rushil Jain (alumnus Dfl)
 - Abke Geels (alumnus)
 - Sergio Catellanos Arciniega (alumnus SPD)
- 14.30-15.15 Attending a programme committee meeting: meeting of BoS TW/AM
- Cor Kraaikamp (chair)
 - Neil Budko (teacher)
 - Dion Gijswijt (teacher)
 - Eline Kleimann (student)
 - Iris Kooijman (student)
 - Irene Ravesloot (student)

- Anita Brouwer-Mooser (secretary, E&SA)
 - Rik Lopuhaa (guest, OD TW/AM)
 - Steffie van Loenhout (guest, Commissioner Education)
 - Marc Corstanje (guest, future Commissioner Education)
- 15.30-16.15 Management: Dean, study programme director(s) and others
- John Schmitz (Dean)
 - Rob Fastenau (former Dean)
 - Hans Tonino (DO, OD CS and ES)
 - Anita Coetzee (Head E&SA)
 - Nick v.d. Meijs (OD EE)
 - Rene van Swaij (OD MSc SET)
 - Rik Lopuhaa (OD TW/AM)
 - Geurt Jongbloed (Chair of Department, DIAM)
- 16.30-17.15 Staff of TI/CS and EE/CE
- Mathijs de Weerd (BSc & MSc CS)
 - Cynthia Liem (BSc & MSc CS)
 - Koen Langendoen (BSc & MSc CS, chairman of BoS of CE&ES)
 - Gerard Janssen (BSc & MSc EE; coordinator for track Telecom&Sensing Systems)
 - Michiel Pertijs (BSc EE & MSc EE, "vakvoorlichter" BSc EE)
 - Milos Cvetkovic (BSc & MSc EE and MSc SET)
 - Sharon Nijemanting (Education Advisor)
- 17.30-18.15 Students
- Luc Enthoven (Commissioner of Education ETV, BSc EE)
 - Yikun Chen (FSC-EEMCS, MSc student EE)
 - David Allaart (FSC-EEMCS, MSc student CS)
 - Francis Behnen (BSc student TI)
 - Daphne van Tetering (BSc student TI)
 - Gabriele Zacca (BSc student EE)
 - Thomas Roos (BSc student EE)
- 18.15-19.30 Panel meeting

Day 4 – Thursday 18 May 2017

Audit trail 2: Study Success Programme – faculties 3mE, Applied Science and Architecture and the Built Environment

- 09.00-10.00 Meeting on P&E cycle
- Timo Kos (Director of E&SA)
 - Gert Jan Scheurwater (Secretary of the TU Delft and Director Strategic Development)
 - Joost Verhaar (Policy Advisor Strategic Development; deputy Administrative Secretary to the Executive Board with particular responsibility for the University Planning & Evaluation Cycle)
 - Linda Verbeek (Policy advisor E&SA)
- 10.00-10.30 Management at central level
- Anka Mulder (VPEO)
 - Timo Kos (director E&SA)
 - Geerlinge Pessers (policy advisor for this programme; also faculty head E&SA 3mE)
 - Remon Rooij (member of evaluation committee, also OD BSc BK)
- 10.45-11.30 Management at faculty (three) and programme (three) level
- Theun Baller (Dean 3mE)
 - Hans Hellendoorn (DO 3mE)
 - Rene Delfos (OD BSc WB)
 - Lucas van Vliet (Dean AS)
 - Jan-Leen Kloosterman (DO AS)
 - Mathieu Noteborn (OD BSc LST)
 - Roberto Cavallo (DO A)
 - Remon Rooij (OD BSc BK)
- 11.45-12.30 Teaching and supporting staff
- Martijn Wisse (BSc WB)
 - Matthijs Langelaar (BSc WB)
 - Regine Vroom (BSc WB)
 - Nora Goosen (BSc LST)
 - Peter-Leon Hagedoorn (BSc LST)
 - Helmi Schlaman (coordinator BSc LST)
 - Kristal Aalbers (BSc Bk)
 - Alexandra den Heijer (BSc Bk)
 - Steven Steenbruggen (BSc Bk)
- 12.45-13.15 Students with a functional impairment
- Martijn van den Hoek
 - Gerben Hoogendoorn
 - Lotte Souren
 - Aisha So
- 13.15-14.30 Panel meeting during lunch

Audit trail 3: Educational Developments and Innovation: Faculty AE, CEG, TPM

- 14.30-15.15 Management at central level
- Rob Fastenau (Dean ES)
 - Rob Mudde (Distinguished Professor of Science Education)
 - Nellie v.d. Griend (Head SDV, E&SA)
 - Toine Andernach (teacher quality, E&SA)
 - Marinke Sussenbach (policy advisor ES; involved in credits for MOOCs programme)
 - Willem van Valkenburg (Manager Production & Delivery Open, Online & Blended Courses ES)
 - Elly Pauw (HR advisor)
- 15.30-16.15 Management at faculty (three) and programme (three) level
- Rinze Benedictus (Dean AE)
 - Aldert Kamp (DO AE)
 - Bert Geerken (Dean CEG)
 - Marjan Bellersen (faculty head E&SA CEG)
 - Evert Slob (DO CEG)
 - Jenny Brakels (faculty head E&SA TPM)
 - Ivo Bouwmans (OD BSc TB)
 - Bert Enserink (OD MSc EPA)
- 16.30-17.15 Teaching and supporting staff
- Kevin Cowan (AE)
 - Mark Voskuijl (AE)
 - Eefke Rienstra (AE support)
 - Bert Sluys (CEG)
 - Karel van Dalen (CEG)
 - Harry Kneppers (Wi-service (EEMCS) for CEG)
 - Pieter Bots (TPM)
 - Scott Cunningham (TPM)
 - Joost Groot Kormelink (TPM support)
- 17.30-18.15 Education fellows
- Bertus Beaumont (AS)
 - Joris Melkert (AE)
 - Ivo Bouwmans (TPM)
 - Bas Flipsen (IDE)
 - Merle de Kreuk (CEG)
- 18.15-19.30 Panel meeting

Day 5 – Friday 19 May 2017

- | | |
|-------------|--|
| 09.00-10.45 | Panel meeting |
| 10.45-11.15 | Executive Board <ul style="list-style-type: none">▪ Tim Van der Hagen (President)▪ Anka Mulder (VPEO) |
| 11.15-12.30 | Final panel meeting including lunch |
| 12.45-13.15 | Feedback session |

Appendix 4 – Documents

Basic documents

- Adviesrapport aanvullende fraudepreventiemaatregelen. TU Delft, 2015.
- Adviesrapport Technische Universiteit Delft. NVAO, 2011-10-05.
- Bestuur- en beheersreglement. TU Delft, 2014.
- Continu ontwikkelen van de onderwijskennis en -vaardigheden van wetenschappelijk personeel. TU Delft, juni 2015.
- Decision memorandum The Year of Education. College van Bestuur TU Delft, september 2015.
- Draaiboek nieuwe BSc-MSc opleidingen TU Delft faculteit. TU Delft, 2014
- Evaluatie nieuwe curricula VS/SR/13/23. Centrale studentenraad TU Delft, 2013-12-20.
- Framework certification and quality assurance for professional education. TU Delft, 2016.
- Global E3 [Online]. <http://www.iae.org/Programs/GlobalE3#.WJSchE0zU5s>. 20170203 Jaarverslag 2015. TU Delft, 2016.
- Koersen op Studiesucces. Didactiek Werkgroep, 2011.
- Naar een bachelordiploma in vier jaar! Adviesnotitie maatregelen studiesucces TU Delft. Brakels J.K., Mudde, R.F.; Sanders, F.M.; Drunen, T.P.J.; Schmit, L., 2011.
- Onderwijs in de wetenschappelijke loopbaan. TU Delft, juni 2015.
- Onderwijskwaliteitsplan. TU Delft, 2009.
- Over de CCTO [Online] // KIVI. <https://www.kivi.nl/afdelingen/ccto/over-de-ccto>. 20161031.
- Register opleidingen TU Delft 20162017. TU Delft, 2015.
- Roadmap 2020. TU Delft, 2011.
- Roadmap Onderwijsruimtes. TU Delft, 2014.
- Self-evaluation Report TU Delft, 2017.
- Strategic Plan Internationalisation of Education 2014-2020. TU Delft, 2014.
- Strategische Planning & Evaluatie. TU Delft, 2014.
- The next phase of open and online education. TU Delft, February 2014.
- Toetsing minors TU Delft. TU Delft, 2010.
- Toetsingskader joint education internationale masteropleidingen TU Delft. TU Delft, 2016.
- TU Delft Campusvisie. TU Delft, 2013.
- Verhogen Studiesucces TU Delft. College van Bestuur TU Delft, 2011.
- Vision on Education 80% draft. TU Delft, 2016.

Additional documents

- Adviesrapport TUDelft midterm review ITK
- Beleidsplan Honours programme Delft
- Cookbook Education Spaces TU Delft
- Graduate school Vision and mission
- Het nieuwe tentamenbeleid en de uitvoering ervan
- Kengetallen TUD handboek
- Agenda Groepsraad 10 oktober 2016
- Agenda Groepsraad 13 maart 2017
- Agenda Groepsraad 15 mei 2017
- Agenda Groepsraad off site 19 december 2016
- Onderwijs onderwerpen Groepsraad 2015-2017

Audit trail past performance

- Handboek Kwaliteitszorg IO
- Jaarrapportage Onderwijskwaliteit BSc IO 2014-2015
- Midterm Review 2017 - final
- OKIO Opleidingskommissie Industrieel Ontwerpen agenda 436
- OKIO Opleidingskommissie Industrieel Ontwerpen agenda 437
- Plans of actions IDE
- Minutes Board of studies TW_AM meeting
- BSc-EE-self-reflection
- MSc-EE-CE-self-reflection
- TUD Bachelor Electrical Engineering Report
- TUD Master Computer Engineering Report
- TUD Master Electrical Engineering Report
- SET midterm review
- Annual report MSc CS 2015-2016
- Annual report MSc EE 2015-2016
- Assessment Policy Faculty of EEMCS
- Board of Studies TW_AM Agenda 17022017
- Board of Studies TW_AM Agenda 17052017
- Board of Studies TW_AM Agenda 23032017
- Handboek Onderwijskwaliteitszorg EWI
- Jaarrapportage BSc EE 2015-2016
- Jaarrapportage BSc TI 2015-2016

Audit trail Study Success Programme

- Beleidsnotitie studeren met een functiebeperking
- Stand van zaken beleid studenten met functiebeperking 2009 2016
- Eindrapport van de evaluatiecommissie Project Studiesucces TU Delft. Maart 2017

Audit trail Educational development and innovation

- 4TU UTQ regulation
- A system for DUT Education Fellowship
- BKO-Equivalentieprocedure TU Delft nieuwe staf
- English Language Screening
- Prize Innovative Teaching Talent of the year
- The English Language Test Background information
- University Teaching Qualification Competences and assessment criteria
- Centre for Education and Learning (CEL):
<http://www.educationandlearning.nl/home>
- Centre for Engineering Education (CEE): <https://www.4tu.nl/cee/en/>
- Magazine Educating the world: tu-delft.instantmagazine
- Online education activities Aerospace Engineering:
<https://www.tudelft.nl/en/ae/education/online-education/>
- Online education activities Civil Engineering and Geosciences:
<http://www.citg.tudelft.nl/en/study/online-education/>
- Online education activities Technology, Policy and Management:
<http://www.tbm.tudelft.nl/en/study/online-education/>
- The Educator jan 2017:
<http://tudos.a1.mailplus.nl/genericservice/code/servlet/React?enclId=f2krPT8kV5ijfPC&actId=199592&command=openhtml>

- The Educator okt 2016:
<http://tudos.a1.mailplus.nl/genericservice/code/servlet/React?enclId=f2krPT8kv5ijfPC&actId=194472&command=openhtml>
- Website with results from 'Innovatie Eerstejaars Wiskundeonderwijs aan de TU Delft': <http://www.ewi.tudelft.nl/?id=125666&L=1>

Appendix 5 – Abbreviations

3mE	Mechanical, Maritime and Materials Engineering
AE	Aerospace Engineering
AS	Applied Sciences
A+ BE	Architecture and the Built Environment
ba	bachelor's degree
BoS	Board of Studies (<i>Opleidingscommissie</i>)
BSA	<i>Bindend Studie Advies</i> (binding recommendation on the continuation of studies)
CEG	Civil Engineering & Geosciences
DO	<i>Directeur Onderwijs</i> (Director of Education)
EC	European credit point
E&SA	Education and Student Affairs
EEMCS	Electrical Engineering, Mathematics and Computer Science
ES	Extension school
ETH	Eidgenössische Technische Hochschule (ETH)
ESG	European Standards and Guidelines
IDE	Industrial Design Engineering
hbo	<i>hoger beroepsonderwijs</i> (professional higher education)
LST	Life Sciences & Technology
ma	master's degree
MIT	Massachusetts Institute of Technology (MIT)
MOOC	Massive Online Open Courses
NGO	<i>Non gouvernementele organisatie</i> (Non-Governmental Organisation)
NSS	National Student Survey
NVAO	Accreditation Organisation of the Netherlands and Flanders
OAC	<i>Onderwijsadviescommissie</i> (Education Advisory Committee)
OBP	support and management staff
OCW	<i>Onderwijs Cultuur en Wetenschap</i> (Education, Culture and Science)
OCW	OpenCourseWare
OD	<i>Opleidingsdirecteur</i> (Director of Studies)
OR	<i>Ondernemingsraad</i> (Works council)
OER	<i>Onderwijs- en examenreglement</i> (Teaching and examination regulations)
PDCA	Plan, Do, Check, Act
OKZ	<i>Onderwijskwaliteitszorg</i> (Educational quality assurance)
P&E	Planning & Evaluation
RM	Rector Magnificus
SDV	<i>Student- en docentvoorzieningen</i> (Student and staff facilities)
SER	Self Evaluation Report
SR	<i>Studentenraad</i> (Student council)
TPM	Technology, Policy and Management
TU	technical university
UD	University Services (<i>Universiteitsdienst</i>),
VPEO	Vice-president of Education and Operations

NVAO

The independent judgment by the Accreditation Organisation of the Netherlands and Flanders (NVAO) strengthens higher education institutions in their quality culture. On the basis of the judgments NVAO accredits Dutch higher education programmes and students receive a legally recognized degree. NVAO is a binational organisation and works together internationally.

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Colophon

Delft University of Technology

Advisory Report

Institutional Audit

1 August 2017

Composition: NVAO Department The Netherlands

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