Industrial Design

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CONTENTS

Report on the bachelor's programme Industrial Design and the master's programme Industrial Design of Eindhoven University of Technology 5

Administrative data regarding the programmes.....5
Administrative data regarding the institution.....5
Quantitative data regarding the programmes.....5
Composition of the assessment committee 6
Working method of the assessment committee 6
Summary judgement 9
Description of the standards from the Assessment framework for limited programme assessments 13

Appendices 33

Appendix 1: Curricula vitae of the members of the assessment committee 35
Appendix 2: Domain-specific framework of reference.....37
Appendix 3: Intended learning outcomes 41
Appendix 4: Overview of the curricula.....45
Appendix 5: Quantitative data regarding the programmes.....49
Appendix 6: Programme of the site visit 51
Appendix 7: Theses and documents studied by the committee.....53
Appendix 8: Declarations of independence 55

This report was finalised on 14 March 2014

Report on the bachelor's programme Industrial Design and the master's programme Industrial Design of Eindhoven University of Technology

This report takes the NVAO's Assessment framework for limited programme assessments as its starting point.

Administrative data regarding the programmes

Bachelor's programme Industrial Design

Name of the programme:	Industrial Design
CROHO number:	50441
Level of the programme:	bachelor's
Orientation of the programme:	academic
Number of credits:	180 EC
Specialisations or tracks:	
Location(s):	Eindhoven
Mode(s) of study:	full-time
Expiration of accreditation:	31-12-2014

Master's programme Industrial Design

Name of the programme:	Industrial Design
CROHO number:	60441
Level of the programme:	master's
Orientation of the programme:	academic
Number of credits:	120 EC
Specialisations or tracks:	
Location(s):	Eindhoven
Mode(s) of study:	full-time
Expiration of accreditation:	31-12-2014

The visit of the assessment committee Industrial Design to the Department of Industrial Design of Eindhoven University of Technology took place on 14 and 15 November 2013.

Administrative data regarding the institution

Name of the institution:	Eindhoven University of Technology
Status of the institution:	publicly funded institution
Result institutional quality assurance assessment:	applied (pending)

Quantitative data regarding the programmes

The required quantitative data regarding the programmes are included in Appendix 5.

Composition of the assessment committee

The committee that assessed the bachelor's programme Industrial Design and the master's programme Industrial Design at Eindhoven University of Technology of consisted:

- Prof. L.T.M. (Luciënne) Blessing (chair), Professor of Engineering Design and Methodology, Université du Luxembourg;
- Prof. P.J. (John) Clarkson, FREng, Professor of Engineering Design, Director of Cambridge Engineering Design Centre, Cambridge University, UK;
- Prof. I. (Ilpo) Koskinen, Professor of Industrial Design, Aalto University School of Art and Design, Helsinki, Finland;
- Prof. A. (Albert) Pilot, Emeritus Professor of Curriculum Development and Professor of Chemistry Education, Utrecht University;
- Prof. (emeritus) M. (Markku) Salimäki, Director (em.) of International Design Business Management, Aalto University School of Business, Helsinki, Finland;
- F.R. (Ruben) van den Hout, BSc (student member), Master's student Industrial Design, University of Twente.

The committee was supported by Dr. J. (Jetje) de Groof, who acted as secretary.

The board of Eindhoven University of Technology and the Accreditation Organisation of the Netherlands and Flanders (NVAO) approved the composition of the assessment committee. Appendix 1 contains the curricula vitae of the members of the committee. All members of the committee and the secretary signed a declaration of independence as required by the NVAO protocol to ensure that they assess without bias, professional preference or personal interest, and that the assessment is made without undue influence from the institute, the programme or other stakeholders (see Appendix 8).

Working method of the assessment committee

The assessment of the Industrial Design programmes at the Eindhoven University of Technology was part of a cluster assessment. The committee assessed eight programmes at three universities: the University of Twente, Eindhoven University of Technology, and Delft University of Technology.

- Prof. L.T.M. (Luciënne) Blessing (chair), Professor of Engineering Design and Methodology, Université du Luxembourg;
- Prof. P.J. (John) Clarkson, FREng, Professor of Engineering Design, Director of Cambridge Engineering Design Centre, Cambridge University, UK;
- Prof. I. (Ilpo) Koskinen, Professor of Industrial Design, Aalto University School of Art and Design, Helsinki, Finland;
- Prof. A. (Albert) Pilot, Emeritus Professor of Curriculum Development and Professor of Chemistry Education, Utrecht University;
- Prof. (emeritus) M. (Markku) Salimäki, Director (em.) of International Design Business Management, Aalto University School of Business, Helsinki, Finland;
- M. (Manon) Kühne, BSc (student member), Master's student Integrated Product Design, Delft University of Technology (assessment University of Twente);

- P.G. (Philémonne) Jaasma, BSc (student member), Master's student Industrial Design, Technical University Eindhoven (assessment Delft University of Technology);
- F.R. (Ruben) van den Hout, BSc (student member), Master's student Industrial Design, University of Twente (assessment Eindhoven University of Technology).

Preparation
After receiving the critical reflection, the project manager checked the quality and completeness of the information provided. After approval, the critical reflection was forwarded to the committee, in both printed form and digitally. In addition, the committee members selected and read a number of theses for each programme that was assessed (see appendix 7).

Before the site visit, the project manager created a draft programme for the interviews (see appendix 6). The draft programme was discussed with the chair of the committee and the coordinator of the educational institute. As requested by QANU, the coordinators of the programmes carefully composed a select and representative panel for all interviews.

Site visit
During the initial meeting at the start of each site visit, the committee members discussed their findings regarding the critical reflection and the theses. They also discussed their task and working methods and the proposed domain-specific requirements (see appendix 2).

During the site visit, interviews were held with representatives of the programme, students, alumni, staff members, the Education Committee, the Examining Board and a student adviser. A consultation hour was scheduled to give students and staff of the programmes the opportunity to talk to the committee. No requests were received for the consultation hour.

The committee used part of the site visit to discuss the assessment of the programmes and to prepare a preliminary presentation of the findings. The site visit concluded with an oral presentation of the preliminary findings by the chair of the committee.

Report
After the site visit the project manager wrote a draft report based on the committee's findings. The draft was first commented upon by the committee members and then sent to the faculty to check for factual irregularities. All comments made by the faculty were discussed with the chair of the committee and, if necessary, with the other committee members. After revision, the report became official.

Decision rules
In accordance with the NVAO's Assessment framework for limited programme assessments (as of 22 November 2011), the committee used the following definitions for the assessment of both the standards and the programme as a whole.

Generic quality
The quality that can reasonably be expected in an international perspective from a higher education bachelor's or master's programme.

Unsatisfactory
The programme does not meet the current generic quality standards and shows serious shortcomings in several areas.

Satisfactory
The programme meets the current generic quality standards and shows an acceptable level across its entire spectrum.

Good
The programme systematically surpasses the current generic quality standards across its entire spectrum.

Excellent
The programme systematically well surpasses the current generic quality standards across its entire spectrum and is regarded as an (inter)national example.

Summary judgement

This report provides the findings and considerations of the Industrial Design committee on the bachelor's and master's programmes in Industrial Design (ID) at the Eindhoven University of Technology (TU/e). The assessment is based on information provided by the critical reflection, interviews during the site visit and a selection of theses.

Bachelor's programme Industrial Design

Standard 1: Intended learning outcomes
The ID programmes of TU/e aim to produce industrial designers of intelligent systems, products and related services with a clear vision of how they want to transform society through their designs. Graduates are meant to be self-directed and continuously learning designers for the transformation economy, i.e. an economy where stakeholders work together on local solutions for local issues that stem from greater global issues.

The committee appreciates that the programme has a clear focus (intelligent systems) and is aiming for a new profile of industrial designers. It finds that the intended learning outcomes of the bachelor's programme are adequately described in terms of level and orientation. They are in line with the Domain-Specific Frame of Reference (DSR) and are a suitable translation of the target profiles. The committee greatly values the way the learning outcomes have been integrated into the frequently updated competence framework, and appreciates the focus on personal development. However, because a new type of designer is being introduced, it is of the utmost importance that the faculty remains in close and constant contact with its stakeholders.

The committee noted that the programme distinguishes five stages of growth and feels there is room for improvement with regard to the description of what is expected from the students at the different growth stages for the different competences. This is especially important for the product design and process skills. The committee also noticed that the bachelor's and the master's programmes are being considered as a continuum. It suggests that the programme should monitor student mobility, in this case the preparation of students for a master's at another university.

Standard 2: Teaching-learning environment
The ID programmes at TU/e use a competency-centred educational model with self-directed learning as its key didactic concept. Students are put in the driver's seat of their education from day one. Their Personal Development Plan (PDP) forms the basis of their evolution. The committee greatly appreciates that the ID programmes at TU/e have chosen a radically different educational model to align the learning process with their holistic view, an endeavour that requires vision, drive and considerable effort, in both planning and execution. It was enthusiastic about the translation of the educational concept into a curriculum that allows for choice and for self-reflection. It ascertained that checks and balances are foreseen in order to ensure that the self-directed learning of the students results in a coherent individual curriculum, as is evident from the competence teams and Themes, and from the support students receive in setting goals in their PDP. It applauds the amount of feedback students receive throughout the year. But given that feedback is a key element in the didactical concept, the committee finds that there is room for improvement in increasing the consistency of the feedback students receive with regard to growth in competencies, designed products and the design process.

The committee is of the opinion that the ID programme should work on the further integration of the required Bachelor College (BC) elements in its curriculum. It does understand the difficulties involved, but it is not of the opinion that the two approaches are incompatible.

The committee looked into a selection of curricular activities and was very pleased with their quality. It was impressed with the tight-knit, reflective, involved staff, but also asks that the work pressure of staff be monitored. It noted that the bachelor's programme aims to continue improving constantly. It saw that the points that require further attention are clearly and consistently on the radar of all bodies involved in the programme.

Standard 3: Assessment and achieved learning outcomes
The committee is of the opinion that the assessment system that is in place is adequate and matches the educational concept. It has ascertained that the quality control that is necessary in this specific system is evident and especially values the peer-review system to calibrate the final verdicts. Still, it thinks that this peer-review system should be better documented and that more transparency is needed regarding the elements students are assessed on. Also, the balance between feedback on learning on the one hand, and on the design process and designed products on the other needs to be applied consistently. The committee finds this lack of transparency an important point of improvement for the programme. The assessment is a crucial part of the didactical concept and has major consequences since only two assessments are planned each year.

The committee read a selection of bachelor theses. In its opinion, the final projects meet the requirements with regard to level and orientation. It was very impressed with the level of motivation and independence of the student body at the master's level.

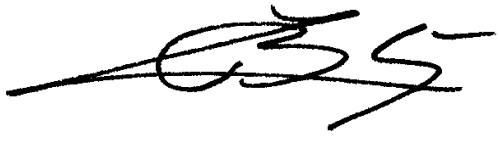
The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

Bachelor's programme Industrial Design:

Standard 1: Intended learning outcomes	satisfactory
Standard 2: Teaching-learning environment	good
Standard 3: Assessment and achieved learning outcomes	satisfactory
General conclusion	satisfactory

The chair and the secretary of the committee hereby declare that all members of the committee have studied this report and that they agree with the judgements laid down in it. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 14 March 2014



Prof. L. Blessing

dr. J. de Groof

Master's programme Industrial Design

Standard 1: Intended learning outcomes
The Industrial Design (ID) programmes of TU/e aim to deliver industrial designers of intelligent systems, products and related services with a clear vision of how they want to transform society through their designs. Graduates are meant to be self-directed and continuously learning designers for the transformation economy, i.e. an economy where stakeholders work together on local solutions for local issues that stem from greater global issues.

The committee appreciates that the programme has a clear focus (intelligent systems) and is aiming for a new profile of industrial designers. It finds that the intended learning outcomes of the master's programme are adequately described in terms of level and orientation. They are in line with the DSR and are a suitable translation of the target profiles. The committee greatly values the way the learning outcomes have been integrated into the frequently updated competence framework, and appreciates the focus on personal development. However, because a new type of designer is being introduced, it is of the utmost importance that the faculty remains in close and constant contact with its stakeholders.

The committee noted that the programme distinguishes five stages of growth and feels there is room for improvement with regard to the description of what is expected from the students at the different growth stages for the different competences, in particular the growth stages at the master's level. It also noticed that the bachelor's and the master's programmes are being considered as a continuum. It suggests that the programme should monitor student mobility, in this case external students entering at the master's level.

Standard 2: Teaching-learning environment
The ID programmes at TU/e use a competency-centred educational model with self-directed learning as its key didactic concept. Students are put in the driver's seat of their education from day one. Their PDP forms the basis of their evolution. The committee greatly appreciates that the ID programmes at TU/e have chosen a radically different educational model to align the learning process with their holistic view, an endeavour that requires vision, drive and considerable effort, in both planning and execution. It was enthusiastic about the translation of the educational concept into a curriculum that allows for choice and for self-reflection. It ascertained that checks and balances are foreseen in order to ensure that the self-directed learning of the students results in a coherent individual curriculum, as is evident from the competence teams and Themes, and from the support students receive in setting goals in their PDP. It applauds the amount of feedback students receive throughout the year. But as feedback is a key element in the didactical concept, it finds that there is room for improvement in increasing the consistency of feedback students receive with regard to growth in competencies, designed products and the design process.

The committee was impressed with the tight-knit, reflective, involved staff, but also asks that the work pressure be monitored to ensure that the staff can concentrate on teaching and research. It found that the master's programme aims to continue improving constantly. It noted that the points that require further attention are clearly and consistently on the radar of all bodies involved in the programme.

The committee looked into a selection of curricular activities and was very pleased with their quality. Students particularly appreciated the modules, which involve working with others, but

had doubts as to whether they could do a design project on their own. A better balance of team and individual work is recommended.

Standard 3: Assessment and achieved learning outcomes
The committee is of the opinion that the assessment system is adequate and matches the educational concept. It ascertained that the quality control required by this specific system is evident and especially values the peer-review system to calibrate the final verdicts. Nevertheless, it thinks that this peer-review system should be better documented and that more transparency is needed regarding the elements students are assessed on. Also, the balance between feedback on learning on the one hand, and on the process and product on the other, needs to be applied consistently. The committee finds this lack of transparency an important point of improvement for the programme. The assessment is a crucial part of the didactical concept and has major consequences since only two assessments are planned each year.

The committee read a selection of master theses. In its opinion, the final projects meet the requirements with regard to level and orientation. It was very impressed with the level of motivation and independence of the alumni.

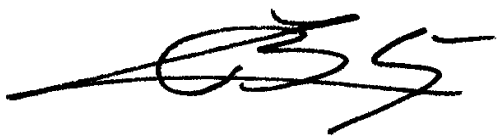
The committee assesses the standards from the Assessment framework for limited programme assessments in the following way:

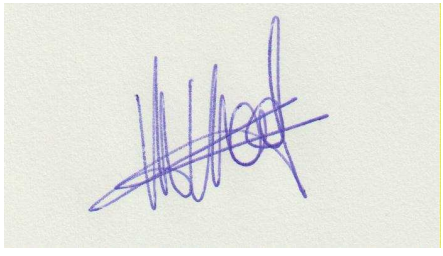
Master's programme Industrial Design:

Standard 1: Intended learning outcomes	satisfactory
Standard 2: Teaching-learning environment	good
Standard 3: Assessment and achieved learning outcomes	satisfactory
General conclusion	satisfactory

The chair and the secretary of the committee hereby declare that all members of the committee have studied this report and that they agree with the judgements laid down in it. They confirm that the assessment has been conducted in accordance with the demands relating to independence.

Date: 14 March 2014





Prof. L. Blessing

dr. J. de Groof

Description of the standards from the Assessment framework for limited programme assessments

Standard 1: Intended learning outcomes

The intended learning outcomes of the programme have been concretised with regard to content, level and orientation; they meet international requirements.

Explanation:
As for level and orientation (bachelor's or master's; professional or academic), the intended learning outcomes fit into the Dutch qualifications framework. In addition, they tie in with the international perspective of the requirements currently set by the professional field and the discipline with regard to the contents of the programme.

Findings

The committee evaluated the intended learning outcomes of the Industrial Design (ID) programmes of Eindhoven University of Technology (TU/e) with regard to content, level and orientation. It studied the domain-specific framework of reference (1.1), the profile and orientation of the programme (1.2) and the objectives and intended learning outcomes (1.3).

1.1. Domain-specific frame of reference (DSR)
In the DSR, the three Schools of Industrial Design Engineering (IDE) in the Netherlands have produced a description of the profile and labour market positions of IDE graduates, some specific features of the IDE curricula and the distinction between the bachelor's and the master's levels. A number of sources were used as a basis for the document, including an international benchmarking study in IDE, the Dublin descriptors, the terms of reference of the last evaluation committee, and the description of the profile and objectives of the three programmes.

The Industrial Design Engineer is described as an academically educated product designer who can integrate knowledge from different fields of technology with human factors, can perceive signals from the market, and can generate creative ideas with new solutions. Seven domains have been identified that are relevant for academic IDE graduates:

- designing;
- IDE-relevant disciplines;
- research;
- scientific approach;
- intellectual skills;
- co-operating and communicating;
- addressing temporal, social and personal contexts.

The description of the domains is phrased in terms of competence descriptors, i.e. as a combination of knowledge, skills and attitudes, and a distinction is made between the bachelor's and the master's levels. The DSR for the IDE programmes in the Netherlands is reproduced in appendix 2.

The committee is of the opinion that all the relevant building blocks for IDE programmes are present in the DSR. The committee finds the DSR to be aligned with relevant IDE programmes worldwide.

1.2. Profile and orientation of the programme

The Industrial Design (ID) programmes of TU/e aim to produce industrial designers of intelligent systems, products and related services with a clear vision of how they want to transform society through their designs. Graduates are meant to be self-directed and continuously learning designers for the transformation economy, i.e. an economy where stakeholders work together on local solutions for local issues that stem from greater global issues. The committee learnt from the alumni that they greatly appreciated this focus.

The desired profile of graduates is T-shaped as well as I-shaped. The former are professionals with real depth regarding their own expertise while also having the competences to collaborate in a broad domain; the latter have their feet firmly planted in the practical world, yet they stretch far enough to abstract, generalise, and imagine. The committee saw in the preparatory documents that these profiles have been discussed with industry.

From the alumni and students, the committee gathered that within this framework, students have great freedom to build up their own profile, gradually focussing on the career they want to pursue. It learned that this freedom is initially challenging for many students, despite the extensive coaching they receive to define their individual programme (see also 2.1.). But it also noted that even bachelor students cope with the freedom well after an initial 'adaptation phase'. Moreover, it appreciates that the approach gives students a sense of responsibility for their own education and vision, which also seems to encourage students to be active outside of the educational context.

The committee appreciates that the programmes are aiming for a new type of industrial designer and took note of the fact that the self-directedness of graduates is welcomed by future employers. Although the new competence model (see 1.3.) was validated externally, the committee thinks there is room for improvement in structurally ensuring the link between the competencies and the industry's needs. This is all the more important as students have considerable freedom in developing their professional profile. Although they are supported by their coaches, the question is whether students are really aware of what industry wants and needs by the time they graduate.

1.3. Objectives and intended learning outcomes

The TU/e has formulated intended learning outcomes for the bachelor's as well as the master's programme. They are reproduced in appendix 3. The domain-specific learning outcomes of the programmes have been framed in the form of a competence framework, which is shaped by the integration of the student's vision and identity with respect to designing, his/her competence development, and the quality of the student's overall design and deliverables. Eleven competences are regarded as being key to the profile the ID programmes aim at (following the revised competence model):

0. self-directed & continuous learning (basic competence)
1. teamwork (meta competence)
2. communication (idem);
3. design & research processes (idem);
4. designing business processes (domain-specific core competence);
5. socio-cultural awareness (idem);
6. user focus & perspective (idem);
7. form & senses (idem);
8. ideas & concepts (idem);
9. integrating technology (idem);

10. descriptive and mathematical modelling (idem).

The ID programmes distinguish five stages in the students' overall development over time. They also indicate the difference between the bachelor's and the master's levels:

1. Blank (when students enter the programme);
2. Awareness (at the end of their first year): students understand all competences, they have experience with most of them, and they know how to continue developing them;
3. Depth (the expected stage for bachelor's graduates): students are able to integrate all competences in the design process;
4. Expertise (the expected stage for master's graduates): students have a clear profile in their competence development, and they have in-depth attitudes, skills and knowledge of the field of design in relation to their competence profile; as a result, the integration of these competences is strongly driven by their personal vision on designing;
5. Visionary: the stage that excellent master's graduates may have started to develop.

The committee finds the level and orientation of the intended learning outcomes good, for the bachelor's as well as the master's programme. It greatly appreciates the way the learning outcomes have been integrated in the competence framework. The stages of the growth model provide an overall, ambitious framework for what is required from students. However, this is a complex framework, and the committee suggests that many students may experience difficulties analysing themselves and their learning process within the framework without expert help. Given the breadth of the competences, it feels that the Personal Development Plan (PDP) process is even more crucial to the success of the pedagogical model (see also 2.1.).

The committee consulted the extensive descriptions of each of the competences in the preparatory documents. The competences are made concrete in the descriptions provided, and acquainting the students with the competences is an explicit goal of the first bachelor year. The committee learned from the programme management that the competence framework, like the field of IDE, is in constant flux. The latest version of the competence model (see above), which restructures the competences, has only recently been developed. In this new model, self-directed learning has become more prominent and is regarded as the basic competence of the model, necessary to develop the seven domain-specific competences. In addition, three of the competences have been labelled meta-competences. They are relevant for the academic and professional competence development. Finally, the importance of the development of engineering knowledge and skills, which external parties had commented upon as one of the least developed, has been highlighted by making 'Descriptive and Mathematical Modelling' a core competence. The committee learned from the Educational Board that staff, students and external partners are involved in this transition process. The new competency model is presented in appendix 3. The committee appreciates the continuous reflection on the actual outcomes and the measures taken to address identified weaknesses.

During the site visit, the committee discussed the minimal level that is required from students at the different stages. It learned from the programme management that although the system is geared towards the students' personal growth through self-directed learning, it is a strict requirement that bachelor's graduates develop and integrate all competences. At the master's level, more specialisation is required. Students develop strength in a selection of competences, following their vision on design and their desired career. They should be aware of the ongoing research and be able to integrate that in their vision.

The committee read in the preparatory documents that the fact that the growth levels are not described in more detail is a concern for students. The programme management explained that it does not want to describe in too much detail what is expected from students, as this means making explicit the smallest common denominator, allowing students to aim to just 'pass' instead of wanting to achieve personal growth. It is the committee's opinion, however, that more clarity should be given, especially regarding the product design skills and process skills that are expected from students. Also, the committee thinks that a clear link between each of the competences and the five stages of growth would benefit the students.

From the material as well as the interviews, it became clear to the committee that the bachelor's and master's programmes are seen as continuous, with the bachelor's going from blank through awareness to depth, and the master's building from depth to reach expertise and in some cases visionary. The committee took note of the fact that quite a considerable proportion of students leaves the programme after the bachelor's level. Also, new students enter at the master's level. The committee learned that for some of them, it takes a long time to get used to the educational model. Against the background of the bachelor's and the master's programme being considered as a continuum, and taking into account the emphasis on self-directed learning, the committee suggests that the programme management should monitor the issue of student mobility between the bachelor's and master's levels.

Until 2010-2011, the research groups most closely related to a competency were responsible for it. As of 2011, only full and associate professors are assigned to be responsible for a competence. The committee read that the strategy has now changed again and that teams of experts across research groups are currently being formed to take responsibility for a competence. This is done in order to work in a more integrated way. The committee appreciates that the competence profile is being constantly updated and that an interdisciplinary group of people is in charge of keeping the competences up to date. It also noted that external partners are consulted in this process, as well as staff and students. It learned from the alumni that they are currently not structurally involved in this process and thinks there is room for improvement in this regard.

Considerations

The committee is of the opinion that all the relevant building blocks for IDE programmes are present in the DSR. It appreciates that the ID programmes at TU/e aim to produce a new type of industrial designer. It finds that the intended learning outcomes of the bachelor's and master's programmes are adequately described in terms of level and orientation. They are in line with the DSR and are a suitable translation of the intended profiles.

The committee values the way the learning outcomes have been integrated into the competence framework and appreciates that students are given a sense of responsibility for their own education and vision. It applauds the fact that the competence profile is frequently updated, using feedback from internal as well as external sources. However, because a new type of designer is introduced, it is of the utmost importance that the faculty remains in close contact with its stakeholders for the foreseeable future to ensure that the balance between the competences, which defines their profile, and the way the competences are trained remain valid from the different stakeholders' perspectives.

The committee thinks there is room for improvement with regard to the description of what is expected from the students at the different growth stages for the different competences. This is especially important for the product design and the process skills.

The committee also noticed that the bachelor's and the master's programmes are considered as a continuum. It suggests that the programme should monitor the issue of student mobility between the bachelor's and the master's levels.

Conclusion

Bachelor's programme Industrial Design: the committee assesses Standard 1 as 'satisfactory'.
Master's programme Industrial Design: the committee assesses Standard 1 as 'satisfactory'.

Standard 2: Teaching-learning environment

The curriculum, staff and programme-specific services and facilities enable the incoming students to achieve the intended learning outcomes.

Explanation:
The contents and structure of the curriculum enable the students admitted to achieve the intended learning outcomes. The quality of the staff and of the programme-specific services and facilities is essential to that end. Curriculum, staff, services and facilities constitute a coherent teaching-learning environment for the students.

Findings

In this standard, the findings of the committee regarding the extent to which the curricula enable students to achieve the intended learning outcomes are described. The findings cover the didactic concept (2.1), curriculum (2.2), feasibility (2.3), staff (2.4), and facilities (2.5).

2.1. Didactic concept

The ID programmes at TU/e use a competency-centred educational model with self-directed learning as its key didactic concept. Students are put in the driver's seat of their education from day one. Alumni and students agreed during the site visit that this is very motivating. The committee learned that many students and alumni specifically chose TU/e for this radically different educational approach.

The PDP of the students forms the basis of their evolution. With the help of a coach (see also 2.3.), students describe what their envisaged growth is for the coming semester in their PDP. This desired evolution is related to the competence profile (see 1.3.) and the overall competence of designing. Next, students select curricular learning activities that provide the best opportunity for their development and at the time they feel they need them.

In line with the competency-centred concept, the ID programmes aim at offering students learning activities through which integration can be achieved, i.e. the application of new knowledge, skills and attitudes in an authentic setting. Students develop their competences by doing such learning activities as assignments (bachelor), modules (master), projects, self-directed learning weeks, exhibitions, workshops and symposia (see also 2.2.). Projects are the backbone of the curricula. Most of the projects have a real client.

Students are regarded as junior employees in the didactical concept of TU/e. Every semester, as students choose a project, they are assigned their own space to work together with other students and staff members, in a theme space. The committee was able to view these working spaces during a tour of the facilities and was very impressed with this set-up. It considers this kind of environment, with close contact between lecturers and students, to be fruitful and encouraging a designer to grow.

Students document their development in a digital portfolio, in which they store the results of their learning activities as well as the feedback received. In addition, they reflect on the quality of their deliverables, their competency development, design process, learning process and attitude across the various learning activities they have accomplished in one semester. This is done in the showcase, which consists of reflections on learning supported by evidence obtained from learning activities (including visual) and forms the basis for the assessment (see 3.1.). The assessment is a formal decision but also a starting point for the students' development and growth in the next semester.

Feedback and reflection are thus essential to the didactical concept of the ID programme, as they enable students to progress through learning loops. This is why the committee talked at length about feedback mechanisms and also looked in detail at the quality of the feedback process as documented in the electronic portfolio. It heard during the site visit that while there are set feedback moments, assignors, module lecturers and project coaches provide feedback throughout the year, both orally and in written form. In addition, students also receive feedback from the clients of projects. They are urged to write down the oral feedback they receive.

When consulting the electronic portfolios, the committee found a great variety in the nature of the feedback offered to the students. First of all, there appeared to be variation in the quality of visible feedback in general. Next, the feedback was not structured: some feedback regarded the competency development and growth of the student, while other feedback looked at the design process or product. Yet again in other feedback, both were addressed. On being asked, students agreed that the form and quality of the feedback vary, but that they can always ask for further explanation in person. As a consequence, they do receive the feedback they need to be able to continue their learning process. The programme management explained that they are still experimenting with how feedback can best be consolidated, without increasing the staff's workload (see also 2.4.).

The committee learned from lecturers and students that it is challenging in the first year to figure out how the educational model works, especially the feedback system. Workshops and assignments are given to assist with getting acquainted with the system, but students and lecturers agreed that only by going through the system could they really pick it up.

The committee greatly appreciates that the ID programmes at TU/e have chosen a radically different educational model, with a clear underlying philosophy, based on several well-established didactical approaches. It also established during the site visit that the management is constantly improving this model and takes into account the feedback provided by students, staff and externals. Through the educational model, the programme seems to be achieving its ambition of making the students passionate about their study and about design, and enabling them to bring in their own vision (in the master). The committee applauds the amount of feedback students receive throughout the year and the availability of the staff to provide feedback quickly. The process is well-organised and supported. However, the effectiveness of the educational model depends on the quality of the personal development process. As the feedback is a key element of the didactical concept, the committee finds that there is room for improvement in increasing the consistency of feedback with regard to growth in competencies, designed products and the design process. Given the importance of the coaches in the whole process, the training of new staff is crucial.

2.2. Curriculum

The curricula of the bachelor's and master's programmes are not fixed as students at the ID programme are responsible for their own education (see also 2.1.). Students select curricular learning activities that provide the best opportunity for their development (based on their PDP), taking into account the composition of the block they are going to do. The structure of the blocks of the bachelor's and the master's programmes can be consulted in appendix 4.

ID does not work with awarding credits for separate learning activities. Students are expected to be present at the university, working 40-hour weeks on projects, assignments, modules, etc. At the end of the semester, they are holistically assessed, and if they pass, 30 credits are awarded for the entire semester.

The ID programmes offer different kinds of learning activities, from which students make a selection. Assignments, modules and projects form the largest chunk of the learning activities. Assignments (bachelor level) and modules (master level) contribute to the development of specific attitudes, skills or knowledge that students can immediately apply in the design process of their project. Assignments generally focus on the foundations for development; modules are more closely linked to ongoing research projects within the department. In addition, ID also offers other learning activities. Workshops are short learning activities, varying from a few hours to a full day. They introduce students to a variety of topics. Self-directed learning activities (SDL) are in which the students organise what they are going to learn and how they are going to learn. Throughout the year, five weeks are reserved for SDL. Students can also choose to use the time for SDL in order to catch up on the development of some missing competences. No semester is the same with regard to the learning activities that are offered as ID aims to link its education directly to societal, business, technological and scientific developments. Assignments, projects and the like are framed in such a way that it is possible to create different kinds of deliverables, thus aligning with the different goals in students' PDP. The committee noted in the preparatory documents that clear learning outcomes are formulated for the separate learning activities.

The committee talked with the students about how learning activities are selected in practice. It learned that according to the goals in their PDP, students give three preferences for projects and are assigned to one. Together with the coach, it is then considered what competences are not supported by the assigned project. These 'gaps' are then filled with assignments. If there is anything a student wants to develop that is not in a preset activity, the student can engage in self-directed learning.

The committee is enthusiastic about the curriculum, which allows for choice and self-reflection, while still ensuring that the learning outcomes can be achieved. It received a consistent view of the didactical concept and the resulting curriculum. It greatly appreciates the wide variety of learning activities on offer, with the contribution of external experts. It found the programme's ambition of continuous improvement to be clearly evident throughout. There is room for new initiatives, and the curriculum improves constantly.

The committee also ascertained that the programme management provides the necessary checks and balances so that the programme stays coherent and allows every single student to develop the necessary competences. Given the individual trajectories of students, it regarded this to be an important issue, which is why it was discussed at length during the site visit, as is evident from the following paragraphs.

Competence teams and 'Themes' ensure the coherence and current relevance of the learning activities that are offered. The management told the committee that a team of experts determines the content and learning activities of each competency. Consequently, they are assigned to lecturers. Along with the competence teams, the ID programmes work with cross-disciplinary Themes. In the Themes, the programme aims to integrate education and research by connecting students to ongoing research projects.

In order to keep a balanced programme, discussions are constantly ongoing about the supply of learning activities against the background of the competency profile and the final outcomes. When preparing the next semester with Theme Champs (for projects) and competence 'responsibles' (for assignments and modules), the Director of Education (DoE) takes the number of first choices for projects and the number of students who selected an assignment or module into consideration. If these numbers drop or are too low, the learning

activity is cancelled, and the responsible educator is requested to develop a new learning activity in discussion with the DoE and theme champ or competence responsible. The committee learned that it is the main task of the Educational Board to ensure that the planning of the learning activities runs smoothly.

As the PDP forms the basis for the composition of each individual curriculum, the committee wanted to know how students are supported in composing it. The programme management elaborated that students know what to put in their PDP based on the input of their coach, the feedback on their learning activities from prior semesters and their developing vision. The committee heard from the lecturers that the coach ensures that the goals are realistic. It learned from the alumni that students are directed towards certain learning activities if particular competences have not yet been developed. Avoidance behaviour is thus not possible. With the exception of the final master's project, students select a project from the offer of each theme. The staff informs students about their projects and tries to recruit interested students during the biannual project market.

Bachelor's programme
The bachelor's programme consists of three years of study and includes a propaedeutic and a final examination. It comprises six blocks along with their respective credits (30 ECTS) and curricular learning activities (see appendix 4). A typical project at the bachelor's level takes up 60% of the time of that semester. Projects are done in teams or individually, with an increase in individual projects as students progress through the bachelor's programme. The final project is an individual project.

Assignments are individual intensive training courses that focus on the integration of competences in a specific learning setting. They are the building blocks that introduce students to several interesting competence directions. Generally, they take up 40% of the available time. The master students commented to the committee that the bachelor assignments provided the right amount of depth at that level. During the site visit, the committee was able to attend the reporting phase of an assignment and found the level to be advanced. It was also impressed by the level of some of the student reflections it reviewed.

The limitation to the current system stated in the critical reflection is that it can be difficult to get into the desired assignments due to the small size of the groups (18-24 students). Problems related to this arise especially at the bachelor's level. The committee learned from the bachelor students that a solution has been found to this and that priority access to assignments is now given from senior to junior. They stated that although it can be disappointing at first, they think this is an adequate solution. They explained to the committee that if they cannot find an appropriate learning activity, they can take the initiative to organise a workshop. The committee appreciates this solution.

Until 2012-2013, students could choose minors to widen or deepen their scope. Since then, the minors have been discontinued. Bachelor students can also do an internship in industry to gain a better understanding of what their role in a company could be like. Finally, bachelor students also have the opportunity to spend a semester abroad, but not many students choose this option.

The committee read in the critical reflection that nearly 25% of bachelor graduates switches to another master's programme. Their motivations are diverse, but include switching to another specialisation within the domain of IDE or a change in interest. Alumni mentioned during the site visit that this mobility is a natural consequence of the fact that students

become self-directed learners during their bachelor years. The committee asks the programme management to continue supporting this mobility as it is currently doing.

The committee read in the preparatory documents and heard during the site visit that the current didactic concept of the ID programme is under pressure due to the university-wide implementation of the Bachelor College (BC), which replaces the existing bachelor's programme of all faculties. Within the BC, students have six compulsory subjects: mathematics, physics, modelling, USE (User, Society and Entrepreneur) basics, design and professional skills as well as an elective package of subjects that look at engineering from a USE perspective, and a major. By participating in the BC, the ID bachelor's programme loses 22% of its freedom of choice. Bachelor students are obliged to take six basic courses and 3 USE courses of 5 ECTS each. Moreover, the setup of the basic courses is more focused on traditional knowledge-centred education, making the connection to ID unclear.

The committee learned from the programme management that they are happy with the evolution to the BC on the one hand, as the philosophy of ID is integrated in the rest of the university. On the other hand, it leads to friction in practice. Students explained that the incompatibility of the concept of self-directed learning with obligatory courses is confusing, especially when there is no application of learning provided in the courses. They also mentioned the fact that they welcomed the opportunity to broaden their knowledge through the BC. The lecturers explained that efforts to integrate the ID concept with the BC are being undertaken but that progress is sometimes slow. Attempts are being made to foresee more possibilities for application on the one hand. On the other hand, ID is trying to ensure that students not only receive a mark for a course, but also extensive feedback that they can reflect and act upon.

The committee is of the opinion that the ID programme should work on the further integration of the required Bachelor College (BC) elements in its curriculum. It understands the difficulties, but it does not believe that the two approaches are incompatible. It supports the initiatives of the ID staff to have other faculty add more application of knowledge in their courses.

Master's programme
The master's programme takes two years and concludes with the master examination. This consists of four blocks along with the respective credits and curricular learning activities. At the master's level, students have to carry out a design project and a research project in the first year. The final master's project takes up two semesters. All projects at the master's level are individual.

The committee learned from the master's students that they have even more freedom in composing their curriculum compared to the bachelor's level. They are expected to develop the competences they are passionate about further. While the PDP at the bachelor's level is more about exploration, the PDP at the master's level focuses on setting specific goals for the student's own research against the background of the development of a personal vision on design.

The committee read that in the master's programme, specialisation is in terms of career perspective; students can choose to specialise as a 'designer' or a 'design researcher'. In the first year, students gain experience with both perspectives, with blocks oriented in each direction. In a design project, students identify and develop a solution to a design opportunity. A design project in itself can make a research contribution when it provides

experiential knowledge that is relevant/meaningful to the research field. In a design research project, students produce knowledge that can guide the design of intelligent systems and products, either in the form of process knowledge or substantive knowledge about different aspects of design artefacts. The committee finds this to be a sensible response to the range of possibilities available in design practice, allowing the students to specialise in many different ways.

Modules are assignments at the master's level and generally take one, two or four full weeks. They can be seen as intensive courses and are closely related to the ongoing research of the lecturers. In some modules, students have the opportunity to co-operate with industry partners. The students explained to the committee that the modules offer a great opportunity to go into depth. The module weeks are very intense but highly satisfying. The students mentioned that they appreciate that modules involve working with others; but some expressed doubts about whether they could design on their own. Given this worry, the committee recommends finding a more optimal balance between team and individual work.

The committee visited a selection of module workshops and found that they were professionally executed and interesting for the students. The level was advanced and the students' presentations convincing. The students were very appreciative of the course materials, a fact that was confirmed by the committee after consultation of this material during the site visit.

A proposal for the final master's project (FMP) is written in the first quartile of the second year; after approval, the student continues with the project, which takes up two semesters. The committee talked with the students about what they perceive to be the goal of their FMP and also about the research component in the final thesis. It learned that the FMP should be about who you are as a designer, and that there is great freedom to express this. The committee appreciates this approach and sees it as effective in nurturing student self-awareness. It also learned that the project plan of students is evaluated before they are allowed to proceed with their project.

2.3. Feasibility

Appendix 5 contains an approximate indication of the contact hours throughout the different blocks of the bachelor's and master's programme. The committee heard from the bachelor students that the first semester of the programme is very challenging. It learned that the programme also requires a lot of time for reflection, but that students consider it to be an integral part of their studies. It read in the preparatory documents that students sometimes struggle with the system's freedom, especially at the beginning of their bachelor's studies.

From the master students, the committee learned that the programme is challenging but feasible. It also talked to students with a bachelor's degree from another university and concluded that the switch had been difficult, but rewarding. It read in the preparatory documents that a transition programme is in place for students with other bachelor's degrees. One of the master students explained to the committee that this premaster provides an adequate preparation. The committee also heard that some students have to go through the entire bachelor's programme to prepare for the master's programme. It asks that the programme management continue to monitor the transition of students between the bachelor's and the master's level.

Students receive different kinds of support throughout the bachelor's and master's courses. The competence coach supports the individual student in his or her competence

development. On average, meetings are planned every other week. In these meetings, the PDP is discussed. The competence coach also supports the student when he or she is completing the self-evaluation at the end of each semester. Coaches are changed each semester. Project coaches are responsible for coaching the project team or individual student. There are weekly meetings to discuss the design process, the deliverables and the team processes if applicable. In addition, all members of the teaching and technical support staff are experts in one or more of the topics of the competence framework. Students can ask any expert for help and input.

The committee talked at length with the students, lecturers and programme management about the coaching and support. It learned that students know whom to turn to if they have questions and that they really value the expert system. They explicitly mentioned that even the busiest professors make time for their questions. They also told the committee that they valued the close bond with the coaches, who are very well trained in general and know which questions to ask. The committee understood that a point of concern was how best to allow new staff members to get used to the educational concept. A control mechanism has been put in place that ensures that first-year students do not get new coaches.

The committee is of the opinion that the bachelor's as well as the master's programme has a high study load, but that the enthusiastic student body knows how to cope with this. It also ascertained that the necessary support is provided in the form of the different coaches students have, the expert system and the open-door policy of staff. The specific setup of theme spaces, with students from all years and staff members, also actively stimulates the feasibility of the programme according to the committee. The data on programme efficiency support this assessment. Although the first-year dropout rate is high, it is not different from that at other universities. Moreover, the management and lecturers mentioned to the committee that due to the specific didactical concept, students that do not 'fit' the educational system generally drop out fast, while the students that do fit stick to the programme.

A Binding Study Advice (BSA) has been in place since 2009-2010 and has been 30 EC. As of the academic year 2013-2014, TU/e will raise the Binding Study Recommendation (BSA) to 40 ECTS. As the first year of the ID consists of two blocks of 30 ECTS each, the BSA has consequently been raised to 60 ECTS for ID students. As in previous years, students will go through two assessments and will receive two verdicts. However, they will only receive credits after the last verdict. If the student receives a P or P+C, he or she may continue the programme (more on the verdicts in 3.1.); if the student receives an H for the last semester, he or she will receive a negative study advice and cannot continue the program. The committee thinks this is a reasonable approach given the new context the ID programme operates in.

The committee learned from the Examination Board that the implementation of the BSA has not led to a change in dropout rates. It also read that the BSA can be helpful to reorient students who do not fit in the specific educational system in an early phase. The programme is currently looking for solutions, like introductory meetings, to prevent these students entering the programme at all.

2.4. Staff

The committee read in the preparatory documents that the ID programmes aim to have 90 Full-Time Equivalents (ftes) on the payroll for research, education and support tasks. The student-staff ratio of the bachelor's and the master's programme can be consulted in Appendix 5. In 2011-2012, the total number of students per fte education was 23.2. ID is

striving for 25 students and 7 graduates per fte education. The calculations are based on a few assumptions, i.e. that scientific staff members spend 50% of their time on education; that doctoral candidates spend 20% of their time on education; and that external teaching staff members (freelancers) spend 100% of their time on education. The committee took note of the fact that the fte-per-student-rate has been dropping in recent years.

ID staff members are primarily facilitators of student learning from various perspectives, such as coaching students in their development process or making their expertise available. The committee wanted to learn about the work pressure for the educational staff, given the multiple roles they operate in and the rising student numbers. It heard that the educational concept is indeed time-consuming, but that lecturers take a lot of pleasure and gain energy from the students' motivation. Moreover, lecturers can plan the learning activities so that they are closely connected to their research. Assignments and modules have also been made more compact in the programme, giving the teaching staff more room for other activities.

The committee is of the opinion that with the increasing organisation/optimisation of the system and as staff become more experienced, the lower fte per student can be partially counteracted. However, any design and feedback-oriented curriculum requires considerable personnel. Students lauded the availability of staff, but the pressure on staff is constantly increasing, putting stress on some of the key components of the educational concept, like the feedback system. While the programme is currently looking for ways to improve this system, solutions have to be sought in a direction that is feasible for staff members, like students writing down the oral feedback or recording the feedback.

The committee read that at the bachelor's level, 78% of staff has a master's diploma, and 43% has a doctorate. At the master's level, this is 88% and 55%, respectively. The committee is of the opinion that there is room for some improvement with regard to the proportion of staff with a PhD, although it is aware that it is necessary to have designers involved in teaching, many of whom will not have a PhD. Although it is not tasked with assessing the research activities of the staff, the committee is concerned about the time available for the staff to do research.

With regard to educational expertise, the committee noted that in 2011-2012, 7% of teaching staff at the bachelor's level held the University Teaching Qualification (UTQ), and 9% at the master's level. It ascertained that from 2009, all newly appointed university teachers have to meet the UTQ within three years of their appointment. The UTQ is also required for promotions or for lecturers with poor results in evaluations. During the site visit, the committee heard that it is an explicit goal to increase the proportion of lecturers with the UTQ. It strongly supports the management in allowing the teaching staff to obtain this qualification.

During the site visit, the committee learned from the lecturers that new lecturers are assigned a buddy. In addition, Educational Days are held four times a year. The committee heard from the lecturers that they greatly appreciate this initiative.

As the competence framework forms the basis of the education at ID, these competences must also be reflected in the staff profile. The committee noted in the preparatory documents that the expertise and background of the teaching staff cover all competences.

The selection criteria and procedures for scientific staff formulated at the TU/e level are followed, but are supplemented with some criteria that are especially relevant for ID. They

have been embellished and refined so that they better cover the theme of design, concerning the end result, the process and the person as designer. Once hired, staff members are encouraged to keep evolving. For example, in 2011 all scientific staff members undertook an English Language assessment, on which ID overall scored high. A variety of courses are also offered by the university in order to improve the level of English of its employees.

To complement the expertise of academic staff with that of non-academics from the professional field and bring their students into contact with these professionals, every year a significant number of freelancers is hired as educators. The Themes (see 2.2.) were established to stimulate integration of all these different perspectives, an approach the committee deems sensible.

The committee was impressed with the staff of the ID programme. The educational concept requires a staff that is tight-knit, reflective, improvement-oriented, committed, and involved. The committee ascertained that all these elements are clearly present. It also found that the organisation of four educational days clearly underpins the commitment to teaching in the programme, and to the existence of a learning culture that also applies to staff. It thinks there is still room for improvement with regard to the proportion of staff with an UTQ.

2.5. Facilities

To facilitate students in accomplishing the deliverables required in the learning activities, ID provides technical support facilities to the students. The committee read that ID considers its facilities compatible with the department's ambition to stimulate an open and exploring attitude of the students. However, the department would benefit from some more extensive facilities for the finishing of prototypes, such as a spray cabin. Another point for improvement is that the availability of technical support is limited. Finally, the number of students is still increasing, and the high-quality support and facilities have to be monitored to ensure they do not suffer as a consequence. When asked, students told the committee that they had no complaints about the facilities.

During the site visit, the committee visited the project/theme rooms, where cooperating students can spend their time. It found this set-up to be very stimulating and conducive to creative teamwork.

Considerations

The committee was very impressed with the teaching-learning environment provided by the bachelor's and master's programmes. Students follow highly individual study trajectories, and the learning activities offered vary from year to year, which is very motivating. The committee ascertained that at the bachelor's as well as the master's level, the programmes have provided the necessary checks and balances in order to ensure that each student composes a programme that is suitable for the intended learning outcomes. It was very pleased with the quality of the learning materials.

The committee greatly appreciates the way in which an innovative and radically different teaching concept is implemented in the bachelor's and master's programme and applauds the coherence of this vision throughout the programme, the research, the teaching, the staff and the student body.

The committee confirmed that the bachelor's and master's programmes aim to constantly improve. It found some points that require further attention. There is room for improvement

in increasing the consistency of feedback with regard to growth in competencies, designed products and the design process. At the bachelor's level, the ID programme and the BC need to be integrated further, combining the strengths of both. There is also an important margin of improvement in the proportion of staff holding an UTQ. Student mobility between the bachelor's and master's is in need of constant monitoring to ensure a smooth transition for incoming and outgoing students. The committee did note that these issues are clearly on the radar of all bodies involved in the programme.

The committee applauds the quality and dedication of the staff, but also asks that their work pressure be monitored, so that this backbone of the teaching-learning environment will also be able to perform at a high level in the future.

Conclusion

Bachelor's programme Industrial Design: the committee assesses Standard 2 as 'good'.
Master's programme Industrial Design: the committee assesses Standard 2 as 'good'.

Standard 3: Assessment and achieved learning outcomes

The programme has an adequate assessment system in place and demonstrates that the intended learning outcomes are achieved.

Explanation:
The level achieved is demonstrated by interim and final tests, final projects and the performance of graduates in actual practice or in post-graduate programmes. The tests and assessments are valid, reliable and transparent to the students.

Findings

In this standard, the findings of the assessment system and methods used are described (3.1), followed by the performance of graduates (3.2).

3.1. Assessment system and method

The committee read in the preparatory documents that ID employs a holistic assessment based on the personal development of the students. Students are not assessed on separate learning activities, but on their integrated development (i.e. their growth) throughout the semester, benchmarked against the set of competences and levels of growth. Although the formal assessment is done only at the end of a semester, students receive feedback on their work and the development of their competences throughout the semester, as discussed in 2.1 and 2.2.

The assessment of students is based on the final exhibition, the showcase, and a meeting between the assessment panel and the student. In the assessments of blocks B1.1 (the first semester of the first bachelor year) through B3.1 (the first semester of the third bachelor year), one assessor is involved; for the assessment of blocks B3.2 (second semester of the third bachelor year) and later, a two-member assessment panel is involved, one member being the student's coach. Assessors and assessment panels are allocated to students each semester by or on behalf of the Board of Examiners. It is a formal requirement that students are not assessed by the same assessor two semesters in a row. The assessment and justification are documented in an extensive form, containing feedback on all competences and on the student's overall growth as a designer.

The exhibition provides the assessor(s) with extensive information on the student's project, design process, approach and attitude towards designing. The assessor(s) enter(s) into dialogue with the student and informs him/her about the elements that will require special attention in the showcase. A few weeks after the exhibition, the showcase is delivered. The assessor(s) then examine(s) the main learning activities and how they have contributed to the student's development. In the showcase, the feedback provided by coaches, assignors, lecturers and experts for all learning activities of a semester is linked. A meeting with the student gives (the) assessor(s) the opportunity to discuss certain elements in more detail, and the student's personal growth.

The procedure for master students in their final semester is slightly different. In the week prior to the plenary assessor meeting, students have the opportunity to give a public presentation of their vision, identity and development in front of the panel of assessors. After the presentation, there is room for questions from the audience. During a subsequent private session, the assessor panel has a final discussion with the student in which he or she has a last opportunity to demonstrate his or her overall development and growth.

Students can receive three verdicts. The P-verdict or 'promotion' means that the student is promoted to the next block and gets 30 credits. Students with a P-verdict can be awarded an 'excellence' qualification (indicated as E). C means 'conditional promotion to the next block'. Students in this case can earn the 30 credits at the next assessment by fulfilling specific conditions. As a consequence of the introduction of the BSA (see 2.3.), the C-verdict has been replaced with the P+C-verdict. With a P+C-verdict, the credits are awarded, but the assessor can set conditions for future development. H(old) implies the student has to repeat the same block, but with different learning activities. The committee heard from the programme management that the verdict system is aligned with the educational concept. Students cannot aim for minimal gains (like a 6); they specify in their PDP where they want to go, and the staff helps them to reach their goal.

The reliability and validity of assessment are enhanced in several ways. Assessors and assessment panels determine a tentative verdict and justification after the meeting with the student. At the end of the assessment period, a plenary meeting is organised, in which all the assessors or assessment panels involved discuss and decide on the final verdict and its justification. The coaches who support the students in their development throughout the year attend this meeting. The calibration of the final verdict according to the critical reflection is especially important against the background of there being few fixed elements in the programme that need to be completed by all students in a similar manner. Also, assessors differ in terms of their background and place a different emphasis on various aspects of student development.

The committee considers the quality of feedback on assessment an important point of improvement as the feedback indeed varies considerably from assessor to assessor. Looking at the electronic portfolios and written feedback received by the students, it remained unclear to the committee what the main focus of the final assessment is: designed products, design process and/or personal development/growth. When asked, different groups of interviewees confirmed that all three elements are important in the final verdict and that students receive feedback (oral) on all three elements. Nevertheless, the committee feels the whole process should be better supported by evidence. The bachelor as well as master students agreed that the transparency of assessment could be improved, especially at the bachelor's level.

The committee took note of the fact that apart from the standard regulations on assessment, a strategy document on the assessment process and verdict system is available on the intranet for all students and staff. Students mentioned during the interviews that they never feel sure about what is expected from them, given assessments at the end of every semester, and being assessed once for everything (see also 1.3.). The committee is of the opinion that the growth levels and their relation to the individual competences could be described more clearly.

The committee read that the task of the Board of Examiners (BoE) is to maintain the quality of examinations, and found that it takes this task very seriously. In recent years, several measures were implemented to improve the assessment system. The improvement of feedback to students is a priority, and their appeals regarding below-standard feedback have been approved. The committee took note of the fact that there is a downward trend in the number of appeals at the bachelor's level (10 in 2011-2012). At the master's level the number of appeals has remained low.

The committee is of the opinion that the assessment process, and the quality measures surrounding it, are up to standard. It greatly values the holistic assessment the student has to go through each semester, receiving feedback he/she can act upon. It appreciates the peer-

review process carried out to improve the inter-rater reliability of the verdicts. Also, the committee applauds the clear involvement of different parties in the process. Yet, there is an important margin of improvement in making the elements the assessment is based on more transparent. Although the system is evidence-based through the use of an electronic portfolio, the committee found the ID programme must better justify and document the verdicts with evidence, and set quality standards for the feedback given to students. This will not only benefit the students, but will help the assessors in the subsequent semester to assess the growth of the students throughout their study. The committee notes that actions have already been taken to improve this.

3.2. Performance of graduates

Bachelor's programme
Master students and alumni confirmed they were well prepared for further study after the bachelor's level. During the site visit, the committee was able to speak with alumni who had started a company after their bachelor's studies and felt fit to do so.

The committee read a selection of bachelor theses. In its opinion, the final projects overall meet the requirements with regard to level and orientation. It took note of the fact that the marks given show the usual degree of variance and were in accordance with the marks it would have given. No more than 10% of the bachelor theses was judged unsatisfactory by the committee. It found that the literature reviews in the theses were relevant and that theory was consistently applied in the students' process.

The committee found the application and development of the competencies to be not always clear in the showcases, although this should be a major aspect of the showcase. The reason may be the fact that the committee members did not see the exhibitions related to the showcases they read. The committee is of the opinion that the showcases could be more self-explanatory in relation to competency development.

Master's programme
The committee read in the preparatory documents that the ID programme conducted an alumni survey in cooperation with the alumni association. The results stated that 77% of the alumni found the ID programme to be a good preparation for their further career, 21% was neutral and 2% gave a negative answer. They felt the programme encouraged their personal growth (53% rate this aspect very high, 42% high). Some 91% of the alumni would recommend ID to future students, and 88% would choose ID again. The competences the alumni reported as finding most valuable are design thinking, self-directed learning, dealing with complex challenges and personal attitude.

Of all the respondents who had graduated and entered the labour market, 50% work at a company, 31% started their own company, and another 12% work as freelancers. A large majority of these graduates are doing design-related work. Only 8% of the respondents reported that they are currently doctoral candidates.

The committee was very impressed with the alumni of the ID programme. They claimed they had no trouble finding an interesting job and supported the claim that ID achieves its goal to educate independent, motivated, self-directed learners. The PhD student among the alumni told the committee that he felt well-prepared for his research.

The committee read a selection of master theses. In its opinion, the final projects meet the requirements with regard to level and orientation. It took note of the fact that the marks given

show the usual degree of variance and were in accordance with the marks it would have given. No more than 10% of the master theses was judged unsatisfactory by the committee. It found that the theses represented work of high quality and were very thoughtful, confirming a user-oriented reflective stance to designing.

As in the bachelor's programme, the committee found the application and development of the competencies to be not always clear in the showcases.

Considerations

The committee is of the opinion that the assessment system that is in place at the ID programme is adequate at the bachelor's as well as the master's level, and matches the educational concept of the programme. It ascertained that the quality control that is necessary in this specific system is in place and especially values the peer-review system to calibrate the final verdicts. It also thinks that this peer-review system should be better documented and that more transparency is needed regarding the elements students are assessed on. It finds this lack of transparency an important point of improvement for the programme as it is also a crucial part of the didactical concept and has major consequences since students only have two assessments each year.

The committee was very impressed with the level of motivation and independence of the student body at the master's level and the maturity and vision of the graduates of the master's programme. The achieved learning outcomes at the bachelor's as well as the master's programme are adequate, as witnessed by the committee in the final bachelor's and final master's projects.

Conclusion

Bachelor's programme Industrial Design: the committee assesses Standard 3 as 'satisfactory'.
Master's programme Industrial Design: the committee assesses Standard 3 as 'satisfactory'.

General conclusion

The committee appreciates that the ID programmes at TU/e are aiming for a new type of industrial designer. It finds that the intended learning outcomes of the bachelor's and master's programmes are adequately described in terms of level and orientation. There is room for improvement with regard to the description of what is expected from the students at the different growth stages for the different competences.

The committee was impressed with the teaching-learning environment provided by the bachelor's and master's programmes. It greatly appreciates the innovative and radically different didactic concept. The points that require further attention are clearly on the radar of all bodies involved in the programme.

The committee is satisfied with the assessment system, but has found that there is an important margin of improvement regarding its transparency. It has confirmed that the achieved learning outcomes at the bachelor's and master's level are adequate.

For all three standards, the committee has formulated a few recommendations for further improvement.

Conclusion

The committee assesses the *bachelor's programme Industrial Design* as 'satisfactory'.
The committee assesses the *master's programme Industrial Design* as 'satisfactory'.

Appendices

Appendix 1: Curricula vitae of the members of the assessment committee

Prof. Lucienne Blessing (chair)
Luciënne Blessing obtained her MSc from the Technical University of Delft (Industrial Design Engineering) and her PhD from the University of Twente (UT) (1994). She worked 1984-1992 as lecturer at the UT (Mechanical Engineering), from 1992-2000 at the University of Cambridge (Engineering Design Centre) as senior research associate and Assistant Director. From 2000-2007 she held the Chair of Engineering Design and Methodology at the University of Technology in Berlin. In 2007 she became Vice-president for Research at the University of Luxembourg (until April 2013) and Professor for Engineering Design and Methodology. Since 1999 she has co-organised the International Summer School on Engineering Design Research for PhD candidates. She co-founded the Design Society (2000), was elected member of its Management Board until 2005, and of its Advisory Board since then. A total of 22 PhD candidates successfully defended their PhD under her supervision and 5 under her co-supervision. Since 2011 she has been a member of the steering committee of the EUA's Council of Doctoral Education.

Prof. John Clarkson
John Clarkson obtained his BA in Engineering (Electrical Sciences) and his PhD in Engineering (Electrical Machines) from the University of Cambridge, 1988. He obtained a Doctor Honoris Causa (Engineering Design) from K.U. Leuven in 2012. He returned to the department in 1995 following a seven-year spell with PA Consulting Group's Technology Division where he was Manager of the Advanced Process Group. He was appointed director of the Engineering Design Centre in 1997 and a university professor in 2004. He is directly involved in the teaching of design at all levels of the undergraduate course. At PA he gained extensive experience of product development with a particular focus on the design of medical equipment and high-integrity systems, with clients requiring a risk-based systems approach to design to ensure the timely delivery of safe systems.
His research interests are in the general area of engineering design, particularly the development of design methodologies to address specific design issues, for example, process management, change management, healthcare design and inclusive design. As well as publishing over 500 papers, he has written and edited a number of books on medical equipment design, inclusive design and process management.

Prof. Ilpo Koskinen
Ilpo Koskinen was a sociologist, but has worked as a professor of industrial design since 1999. His main research interests have been in mobile multimedia, the relationship of design and cities, and methodology in design research. His most recent book is *Design through Research: From Lab, Field, Showroom*, a book on constructive design research (Morgan Kaufmann, San Francisco, 2011). He has been a professor at the University of Art and Design (now Aalto), and held visiting positions in Denmark, Hong Kong and Australia.

Manon Kühne
After finishing pre-university education (natural sciences and technology with French and Drawing as electives), Manon Kühne started her Bachelors in Industrial Design Engineering at Delft University of Technology in 2008. In 2010-2011 she spent a semester abroad studying Innovating Usages and Product at Strate Collège, Sèvres (France). After obtaining her bachelor's degree in July 2011, she postponed the start of her master's to represent students as the Commissioner of Education on the board of the Study Association from August 2011-August 2012. She participated on the Education Committee until July 2013. In September 2012 she started her Integrated Product Design Master, while working as a student

assistant in the Quality Assurance Department of the Faculty. After doing an internship at Fabrique Public Design in Delft (July 2013 – December 2013), she will start her final year in February 2014.

Prof. Albert Pilot
Albert Pilot is Emeritus Professor of Curriculum Development at Utrecht University and Professor of Chemistry Education at that university. His research focuses on curriculum development, design of learning and instruction, talent development, honours programmes, professional development of teachers and context-based science education.

Prof. Markku Salimäki
Markku Salimäki, Dr.Sc.(econ), M.Sc.(eng), was the Director of the International Design Business Management (IDBM) Programme at Aalto University, before he retired in 2012. After graduating from Helsinki University of Technology (Industrial Management) in 1973, he worked in different managerial positions in the Finnish ceramic and glass industry. He left the industry in 1992 to start his doctoral studies at HSE and received his Licenciate Degree in 1996 on the topic of "The Competive Strategy of the Finnish Design Companies". He defended his doctoral thesis and received the degree of Doctor of Science in 2003 at Helsinki School of Economics. In 2007 He was nominated as Visiting Professor at Kyoto Institute of Technology, Japan. In March 2011 he was nominated as Professor-of-Practice at Aalto University's IDBM Program.
Markku Salimäki's research interests include managing international design business in general, competitive strategies of design intensive business, design's role as a competitive factor, design-intensive entrepreneurship and the benefits of multidisciplinary teams. He has published in several scientific journals and management magazines and given key-note and conference speeches in different countries.

Appendix 2: Domain-specific framework of reference

Domain Specific Reference Framework
for the academic Industrial Design Engineering programmes

Introduction

The academic educational programmes of Industrial Design Engineering in The Netherlands conjointly specify the profile of IDE Graduates. In this document, the educational programmes in Delft, Eindhoven and Twente describe that profile, the labour market positions of IDE Graduates, a number of specific features of the IDE curricula and the distinction between the Bachelor's and the Master's level.

In the description of the profile and capabilities of the graduates, the knowledge and skills themselves are described independent of the distinction between the Bachelor's and Master's level. The difference between these levels is described in section 5, and addresses the width and depth of this knowledge and these skills.

The characterisations in this document reflect the common understanding between the three educational programmes as concerns the quintessence of IDE. In this, the document also elaborates on a number of underlying sources[1, 2, 3, 4].

Profile of the IDE graduates

The Industrial Design Engineer is an academically educated product[5] designer who can integrate knowledge from different fields of technology with human factors, can see signals from the market and can generate creative ideas with new solutions. In industry, the need for such versatile product designers is evident.

A Bachelor of Science/Master of Science in Industrial Design Engineering can operate in the field of Industrial Design as an interdisciplinary designer. The graduate is able to recognise the relevant disciplines and aspects, such as technology, manufacturing and logistics, market and user, business and marketing, aesthetics and functionality and is able to integrate these aspects into the development of solutions: products, systems and related services.

In the full development cycle of products, the IDE graduate:

- is able to analyse market demands and user needs along with technological and social opportunities;
- is able to generate a (personal) vision on the design problem;
- is able to generate and select ideas and design concepts;

1 Dublin Descriptors (NVAO protocol).
2 The terms of reference of the last visiting committee "Assessment of Degree Courses Industrial Design Engineering", by A.C. Rotte et al., QANU Utrecht, The Netherlands, December 2007.
3 The descriptions of the profile and objectives of the three IDE programmes.
4 Reports like: Criteria for Academic Bachelor's and Master's Curricula (Joint publication by the three Technical Universities) (Meijers, e.a. TU/e, 2005); International Benchmark in Industrial Design Engineering (TU Delft, December 2005).
5 In the context of the Industrial Design Engineering programmes, the notion 'product' is seen as any combination of physical product, system and (accompanying) services that together constitute a marketable entity.

- is able to transfer existing knowledge to new problems and to implement new knowledge;
- can materialise a concept to the stage of a working model;
- is able to take into account the marketing and the product life cycle.

Because the graduate is an academically educated designer, he has a thorough command of scientific methods and techniques related to the development of products as well as in conducting research. Based on having knowledge and skills in relevant disciplines and sciences, and being able to use these in reasoning and methodological reflection during/on the process of development, the graduate is able to contribute to research projects and to the development of new knowledge.

The graduate is a practiced engineer who proves himself by purposefully rendering added value for the organisation he works in. Moreover, he is self-steering, responsible, creative, is able to build on his own knowledge and skills, is able to develop his own signature and is able to deal with limited certainties. Moreover, he can communicate, can document, visualise and present his design, can structure and manage his projects, can function both individually as well in a multidisciplinary team. The context of his activities can be international and intercultural.

The basis for this IDE graduate profile is formed during the Bachelor's programme and the profile is further developed during the Master's programme.

Domains of knowledge and skills in the IDE curriculum

On the basis of the profile, seven dimensions are identified for academic graduates in the IDE programme. Graduates should have the ability to address all these dimensions:

- *Designing*; A University IDE graduate can realise new or modified artefacts, products or systems, with the aim of creating value in accordance with predefined needs and requirements.
- *IDE-relevant disciplines*; A University IDE graduate is familiar with contemporary knowledge and has the ability to increase and develop this through study.
- *Research*; A University IDE graduate is able to acquire new scientific knowledge through research. In this respect, research entails the development of new knowledge and insight according to purposeful and systematic methods.
- *Scientific approach*; A University IDE graduate has a systematic approach characterised by the development and use of theories, models and coherent interpretations, has a critical attitude and has insight into the nature of science and technology.
- *Intellectual skills*; A University IDE graduate is able to adequately reason, reflect and form a judgment. These abilities are acquired or refined within the context of a discipline, and then become generically applicable.
- *Co-operating and communicating*; A University IDE graduate is able to work with and for others. This not only requires adequate interaction and a sense of responsibility and leadership, but also the ability to communicate effectively with colleagues, clients, (end-) users, suppliers, experts and laymen. He is also able to participate in a scientific or public debate.
- *Addressing temporal*, social and personal contexts; Science and technology are not isolated, and always have temporal, social and personal contexts. Beliefs and methods have their origins; decisions have social consequences in time. A University IDE graduate is aware of this, and has the competence to integrate these insights into his scientific work.

The IDE curriculum includes the following aspects/building blocks:

- Design Projects;
- Design Methods and Techniques;
- Engineering;
- Management and Market Studies;
- Design;
- Human factors;
- Socio-cultural awareness;
- Research Practices.

Furthermore, the IDE curriculum is a programme that provides a balance between the formation, processing, application, integration and contemplation of theory and skills. The Design Projects are the core of the curricula. The other building blocks are taught and integrated in the Design Projects.

Labour market perspective

Traditionally, prospects for designers in the labour market have been closely linked to the overall economic situation. In times of a booming economy, jobs were offered to graduates even before they had completed the IDE-programme.

In a declining economy, it can take graduates one or two years to find a suitable job. However, the enormous potential of current new developments (such as smart products, smart environments and portable products) means that new industrial designers are likely to be in great demand. More and more, governments and industry are convinced that innovation and smart design are set to play a very important role in future society.

Also, the fact that the domain of Industrial Design is widening its scope (for example to services, product-service combinations, the design of environments, the management of product development, brand design), means that the domain could soon become less dependent on the state of the economic situation.

So in the long run, the influence of design in society will increase, as will the demand for highly educated professionals in this field.

IDE graduates are found in jobs such as industrial designer, product designer, product engineer, design engineer, design manager, product manager, interaction designer, researcher, usability consultant, design-centred researcher, strategic designer, brand manager, New Product Development project leader, innovation consultant, design-brand consultant. Up until now, a relatively low number of Bachelors' graduates has directly entered the labour market.

Differences between a Bachelor's and a Master's graduate

The Bachelor's and the Master's degree differ in terms of orientation and level.

A Bachelor's graduate	A Master's graduate
Can apply knowledge in various familiar situations	Can apply knowledge in new situations
Can work under supervision; average level of autonomy	Can work independently; high level of autonomy
Can approach/tackle and solve (relatively) basic (design) problems/questions	Can approach/tackle and solve (more) complex(design) problems
Can develop knowledge and skills/ competencies from related disciplines	Can develop knowledge and skills/ competencies from various disciplines
Can integrate and apply knowledge and skills/competencies in relatively basic (design) problems/questions	Can integrate and apply knowledge and skills/competences in more complex (design) problems
Can participate in the design and/or research process	Can adjust the design and/or research process to meet the demands of the task at hand
Has sufficient knowledge of the disciplines to judge the relevance of new developments, and can translate this to own domain	Has sufficient deep-seated knowledge of the disciplines to be able to form a (scientific) judgment, and can translate this to own domain
Can use scientific research findings in the design process and can perform a simple research project under supervision	Can plan and perform scientific research and can reflect on the phases of the research process
Can communicate opinions, ideas, information and results clearly	Can communicate conclusions, including the underlying knowledge, motives and deliberations, clearly, convincingly (and unambiguously)

Appendix 3: Intended learning outcomes

Bachelor's programme

Bachelor of Science Graduates in Industrial Design:

- are qualified to degree level within the 'science engineering & technology' domain;
- are competent in the relevant domain-specific discipline(s) to the level of a Bachelor of Science by having achieved the stage of 'Depth' for their overall competence of designing, which includes integration of the following competency areas:

    1. ideas and concepts
    2. integrating technology
    3. user focus and perspective
    4. social cultural awareness
    5. business process design
    6. form and senses
    7. teamwork and communication
    8. design and research processes
    9. self-directed and continuous learning
    10. descriptive and mathematical modelling

Master's programme

Master of Science Graduates in Industrial Design:

- are scientifically educated, engineering-driven individuals with a full academic master's degree;
- are qualified to degree level within the domain of 'science engineering and technology';
- are competent in the relevant domain-specific discipline(s) to the level of a Master of Science by having achieved the stage of 'Expertise' for their overall competence of designing, which includes integration of the following competency areas:

    1. ideas and concepts
    2. integrating technology
    3. user focus and perspective
    4. social cultural awareness
    5. business process design
    6. form and senses
    7. teamwork and communication
    8. design and research processes
    9. self-directed and continuous learning
    10. descriptive and mathematical modelling

- are capable of acting as independent practitioners within the Industrial Design profession;
- understand the complicated challenges of designing intelligent products, systems and services;
- are able to initiate and execute research and design activities that will lead to the creation of a successful solution;

- have acquired specialised in-depth knowledge, insights and skills within one or more specific competency areas

For ID students and staff a competence framework has been defined. The overall competence of designing is shaped by the integration of students' competency development and profile; the quality of their deliverables; their control over the design process and performance of activities in the reflective transformative design process; and their overall attitude (professional and personal). The ten competency areas enable designing. They either relate to the content of the system to be designed, to the approach needed for the act of designing or to becoming a designer / unique opportunity creator. The ten competency areas are listed and defined below.

1. Ideas and Concepts
Develop visions, innovative ideas and concepts through creativity techniques, experimentations and the translation of research.

2. Integrating Technology
Explore, visualize, create and demonstrate innovative concepts and experiences using technology, as well as analyze the technical and economic feasibility of complex designs in which technology is integrated.

3. User Focus and Perspective
Understand human characteristics, goals and needs, and the context of use; create empathy with users throughout the design process; and design user-system interaction for user experiences.

4. Social Cultural Awareness
Drive the design process from an awareness and understanding of developments in society, envision ones designs in society, put the development of systems in a broader perspective, and take position in and evaluate the impact and mediating role of a system, product or service on society.

5. Business Process Design
Model, analyze and (re)design industrial business processes required for the successful introduction of intelligent systems, products and related services into the market.

6. Form and Senses
Experience and develop – through doing and abstraction - aesthetical (physical) languages that connect thought and (dynamic) form, in order to communicate specific properties of the design concept.

7. Teamwork and Communication
Work together towards a common goal using all strengths within a team and communicate opinions, ideas, information and results clearly and convincingly.

8. Design and Research Processes
Master the design process and the research process, and adjust these processes to the demands of the task at hand.

9. Self-directed and Continuous Learning
Take responsibility for and give direction to personal development, based on a continuous process of self-reflection and out of curiosity for future developments in technology and society.

10. Descriptive and Mathematical Modelling
Be able to create and apply descriptive and mathematical models by using formal and mathematical tools, in order to justify design decisions and support the design of complex, highly dynamic and intelligent systems.

New competence framework

0. Self-directed and Continuous Learning (SDCL)
1. Ideas and Concepts (IC)
2. Integrating Technology (IT)
3. User Focus and Perspective (UFP)
4. Social and Cultural Awareness (SCA)
5. Designing Business Processes (DBP)
6. Form and Senses (FS)
7. Descriptive and Mathematical Modelling (DMM)
8. Design and Research Processes (DRP)
9. Teamwork (T)
10. Communication (C)

Appendix 4: Overview of the curricula

Bachelor's programme

Year 1	*Block B1.1 (30 credits), Task code DDB11* • one 96-hour introduction in competency-centred learning and one 48-hour assignment • 1 project * • Self-directed learning activities in dedicated weeks • Studium Generale lectures as part of Academic Training • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on development, such as (project-related) workshops
	Block B1.2 (30 credits), Task code DDB12 • three 48-hour assignments • 1 project * • Self-directed learning activities in dedicated weeks • Studium Generale lectures as part of Academic Training • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on development, such as (project-related) workshops

Year 2	*Block B2.1 (30 credits), Task code DDB21* • three 48-hour assignments or two 48-hour assignments and Academic Training (either task code 0UC11, oUC12 or oUC14 , together with 0UC25) ** • 1 project* • Self-directed learning activities in dedicated weeks • Studium Generale lectures as part of Academic Training • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on development, such as (project-related) workshops
	Block B2.2 (30 credits), Task code DDB22 • three 48-hour assignments or two 48-hour assignments and Academic Training (either task code 0UC11, oUC12 or oUC14 , together with 0UC25) ** • 1 project * • Self-directed learning activities in dedicated weeks • Studium Generale lectures as part of academic Training • Proposal for minor/internship/exchange • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on development, such as (project-related) workshops

Year 3	*Block B3.1 (30 credits), Task code DDB31* • Minor, which also includes internship and exchange; *** • Self-directed learning activities in dedicated weeks • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on development, such as (project-related) workshops
	Block B3.2 (30 credits), Task code DDB32 • Either one or two 48-hour assignments • Final Bachelor Project (FBP) * • Self-directed learning activities in dedicated weeks • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on development, such as (project-related) workshops

Master's programme

Year 1	*Block M1.1 (DDM11, 30 credits)* • Design or research project * • 4 module weeks • Self-directed learning activities • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on competency development, such as (project-related) workshops
	Block M1.2 (DDM12, 30 credits) • Design or research project * • 4 module weeks • Self-directed learning activities • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on competency development, such as (project-related) workshops
Year 2	*Block M2.1 (DDM21, 30 credits) *** • Proposal FMP • First stage FMP • Self-directed learning activities • 4 module weeks • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on competency development, such as and (project-related) workshops
	Block M2.2 (DDM22, 30 credits) • Final stage FMP • Showcase activities, exhibitions, assessment preparation • Other curricular activities focused on competency development, such as and (project-related) workshops

Appendix 5: Quantitative data regarding the programmes

Data on intake, transfers and graduates

Bachelor's programme

Dropout of Bachelor Program

Cohort	2006	2007	2008	2009	2010	2011
Size cohort	89	112	101	98	119	109
Dropout after 1st year	25%	29%	22%	31%	24%	28%
Dropout after 2nd year	25%	30%	28%	37%	34%	
Dropout after 3rd year	44%	32%	32%	39%		

Throughput of Bachelor Program

Cohort	**Number of students**	**% of total cohort**	**Obtained Bachelor Degree**			
			Within 3 years	**Within 4 years**	**Within 5 years**	**Within 6 years**
2006	67	75%	9%	48%	69%	73%
2007	80	71%	23%	69%	84%	
2008	79	78%	32%	73%		
2009	68	69%	31%			
2010	90	76%				
2011	79	72%				

Number of graduates Bachelor Program

Year	**Number of Bachelor Graduates**	**Cum Laude**	
2012	23	13 %	3
2011	91	8 %	7
2010	111	4 %	4
2009	83	4 %	3
2008	72	7 %	5
2007	67	3 %	2
2006	71		

Master's programme

Dropout of Master Program

Cohort	2006	2007	2008	2009	2010	2011
Size cohort	37	51	38	38	55	58
Dropout	35%	20%	26%	21%	13%	9%

Throughput of Master Program

Cohort	**Number of students**	**% of total cohort**	**Obtained Bachelor Degree**		
			Within 2 years	**Within 3 years**	**Within 4 years**
2006	17	46%	-	59%	71%
2007	28	53%	25%	68%	71%
2008	16	40%	31%	75%	75%
2009	28	68%	39%	61%	
2010	31	51%	42%		
2011	33	51%			

Number of graduates Master Program

Year	Number of Master Graduates	Cum Laude	
2012	14		
2011	37	11%	4
2010	37	11%	4
2009	34	9%	3
2008	37	8%	3
2007	10		
2006	6		

Teacher-student ratio achieved

TABLE 4.1: TEACHING STAFF IN FTES AND STUDENT-STAFF RATIO

	06/07	07/08	08/09	09/10	10/11	11/12
Fte Academic	17	19	20	19	15	13
Fte PostDoc/Doctoral candidates	1	1	1	2	2	2
FTE External	18	11	5	6	9	8
Total FTE educators	36	31	26	27	26	23
Number of student BSc	394	409	406	421	428	420
Number of student MSc	49	85	104	109	105	114
Total number of students	443	494	510	530	533	534
Number of graduates BSc	71	67	72	83	111	91
Number of graduates MSc	6	10	37	34	37	37
Total number of graduates	77	77	109	117	148	128
Student/Staff Ratio	**12.3**	**15.9**	**19.6**	**19.6**	**20.5**	**23.2**
Graduate/Staff Ratio	**2.1**	**2.5**	**4.2**	**4.3**	**5.7**	**5.6**

Average amount of face-to-face instruction per stage of the study programme

TABLE 3.2: APPROXIMATE INDICATION OF CONTACT HOURS PER WEEK THROUGHOUT THE DIFFERENT BLOCKS

	B1.1	B1.2	B2.1	B2.2	B3.1	B3.2	M1.1	M1.2	M2.1	M2.2
Contact hours*	21	21	21	21	-	13	16	16	16	8

**Contact hours were calculated for 2 - 4 (mean of 3) contact hours per week for an assignment, 2 - 4 (mean of 3) contact hours per day for a module during module weeks, and 8 hours of staff support in the themes of which 1 hour of personal contact per week for projects.*

Appendix 6: Programme of the site visit

Thursday 14 November 2013

15.30-16.45 **Preparation meeting + reviewing documents (committee only)**

16.45-17.30 **Preparation Committee Critical Reflection**
Prof. dr. ir. Aarnout Brombacher, Dr. ir. Miguel Bruns Alonso, Prof. dr. Matthias Rauterberg, Prof. dr. ir. Caroline Hummels, Dr. ir. Tilde Bekker

17.30-18.00 **Alumni**
Dr. ir. Saskia Bakker , Ir. Wouter van Dijk, Ir. Sjef Fransen, Guido van Gageldonk, Ir. Jasper de Kruijf, Ir. Carl Megens

18.00-18.30 **Reviewing documents (committee only)**

18.30-21.00 **Dinner (committee only)**

Friday 15 November 2013

8.30-9.15 **Students bachelor**
Vincent Visser, Alex de Ruiter, Tamara Hoogeweegen, David Verweij, Isabelle van der Ende, Nikolai Gillissen, Eva Palaiologk

9.15-10.00 **Students master**
Yasemin Arslan, Tove Elfferich, Jesse Meijers, Gustavo Alberto Ostos Rios, Jackie Hendrikx, Attalan Mailvaganam, Robert Noome

10.00-10.15 **Break**

10.15-11.30 **Teachers bachelor and master**
Prof. dr. ir. Berry Eggen, Dr. Oscar Tomico Plasencia, Dr. Jun Hu PDeng Meng, Ir. Jeroen Thoolen, Ir. Maarten Versteeg, Ir. Sander Mulder

11.30-12.00 **Tour**

12.00-12.30 **Lunch + walk-in hour**

12.30-13.00 **Education committee**
Prof. dr.ir. Loe Feijs, Dr. ir. Joep Frens, Dr. Lu Yuan, Dr. Mathias Funk, Doenja Oogjes, Pepijn Verburg,

13.00-13.45 **Board of Examiners and study advisors**
Prof. dr. ir. Jean-Bernard Martens, Dr. ir. Mark de Graaf, Dr. ir. Pierre Lévy, Dr. Migchiel van Diggelen, Drs. Pleunie van Daesdonk, Drs. Yolanda Hübner, Sonja Joosten,

13.45-14.45 **Preparation final interview**

14.45-15.30 **Final interview Board and Management**
Prof. dr. ir. Aarnout Brombacher, Dr. ir. Miguel Bruns Alonso, Prof. dr. Matthias Rauterberg, Prof. dr. ir. Caroline Hummels, Prof. dr. ir. Berry Eggen, Drs. ing. Jos Hermus, Dr. Migchiel van Diggelen

15.30-17.00 **Drawing up preliminary conclusions (committee only)**

17.00-17.15 **Oral reporting of preliminary conclusions**

Appendix 7: Theses and documents studied by the committee

Prior to the site visit, the committee studied the theses of the students with the following student numbers:

Bachelor's programme

s040775	s071352	s060169
s090514	s070084	s071562
s099055	s088309	s099426
s081336	s050588	s061428
s050597	s080249	s082021

Master's programme

s051287	s032080	s087246
s050202	s060155	s090914
s040201	s061571	s050975
s061724	s050207	s061197
s021149	s040831	s060771

During the site visit, the committee studied, among other things, the following documents (partly as hard copies, partly via the institute's electronic learning environment):

- Descriptions of learning activities;
- Materials of selected modules and assignments;
- Overview projects 2012;
- Electronic portfolio system:
  - Reflections of students;
  - Feedback received;
- Internship reports;
- Annual reports ID 2010-2011 and 2011-2012;
- Board of Examiners reports 2011-2012;
- Policy documents Educational Board;
- Books on reflection in learning and development;
- Documents on the training of new coaches;
- Verdict forms;
- Educational evaluations;
- Alumni survey;

Appendix 8: Declarations of independence

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nederlands - vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Prof. Dr.-Ing. Lucienne Blessing

HOME ADDRESS:

26, Rue de Hassel

L-5899 Syren, Luxembourg

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Industrial Design Engineering Education

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

TU Delft, U Twente and TU Eindhoven

nvao
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Luxembourg DATE: 30 September 2013

SIGNATURE: 

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: **Professor P John Clarkson**

HOME ADDRESS: **6 Clover Court**

Cambridge, CB1 9YN

United Kingdom

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT:

Programmes in Industrial Design

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

Delft University, Eindhoven University of Technology and the University of Twente

nvao
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: **Cambridge, UK** DATE: **17 September 2013**

SIGNATURE:

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Ilpo Koskinen

HOME ADDRESS: Tuluskuja 12 a 2, 01670 Vantaa, Finland

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Industrial Design in TU/Eindhoven, TU?Delft, and Tu/Twente

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

nvao
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Helsinki

DATE: 7 October, 2013

SIGNATURE:

nvao
nederlands - vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: A. Pilot

HOME ADDRESS:

Berkenlaan 13

3707 BA Zeist

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Industrial Design B/M UT/TuD/TUe

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

nvao
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Zeist DATE: November 2, 2013

SIGNATURE:

nvao
nederlands - vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Markku Salimäki

HOME ADDRESS: Pakilantie 84 I, 00660 Helsinki, Finland

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Bachelor`s and Master's programmes in Industrial Design

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

Delft University of Technology, Eindhoven University of Technology and the University of Twente

nvao
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Helsinki Finland DATE: October 2nd, 2013

SIGNATURE:

Markku Salimäki

nvao
nederlands - vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY

TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Frans Ruben van der Hout

HOME ADDRESS: Veldkampstraat 26, 7513 ZB, Enschede, The Netherlands

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Eindhoven University of Technology - Industrial Design

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

University of Twente

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS; CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO; HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Enschede DATE: 14-10-2013

SIGNATURE:

nvao
nederlands - vlaamse accreditatieorganisatie

DECLARATION OF INDEPENDENCE AND CONFIDENTIALITY
TO BE SUBMITTED PRIOR TO THE ASSESSMENT OF THE PROGRAMME

THE UNDERSIGNED

NAME: Jetje De Groof

HOME ADDRESS:

Duivenstraat 17, 2600 Berchem, Belgium

HAS BEEN ASKED TO ASSESS THE FOLLOWING PROGRAMME AS AN EXPERT / SECRETARY:

Industrial Design

APPLICATION SUBMITTED BY THE FOLLOWING INSTITUTION:

Technische Universiteit Eindhoven

nvao
nederlands - vlaamse accreditatieorganisatie

HEREBY CERTIFIES TO NOT MAINTAINING ANY (FAMILY) CONNECTIONS OR TIES OF A PERSONAL NATURE OR AS A RESEARCHER / TEACHER, PROFESSIONAL OR CONSULTANT WITH THE ABOVE INSTITUTION, WHICH COULD AFFECT A FULLY INDEPENDENT JUDGEMENT REGARDING THE QUALITY OF THE PROGRAMME IN EITHER A POSITIVE OR A NEGATIVE SENSE;

HEREBY CERTIFIES TO NOT HAVING MAINTAINED SUCH CONNECTIONS OR TIES WITH THE INSTITUTION DURING THE PAST FIVE YEARS;

CERTIFIES TO OBSERVING STRICT CONFIDENTIALITY WITH REGARD TO ALL THAT HAS COME AND WILL COME TO HIS/HER NOTICE IN CONNECTION WITH THE ASSESSMENT, INSOFAR AS SUCH CONFIDENTIALITY CAN REASONABLY BE CLAIMED BY THE PROGRAMME, THE INSTITUTION OR NVAO;

HEREBY CERTIFIES TO BEING ACQUAINTED WITH THE NVAO CODE OF CONDUCT.

PLACE: Antwerp

DATE: 11/11/2013

SIGNATURE: