BSc Industrial Design
MSc Industrial Design

Department of Industrial Design
Eindhoven University of Technology

Report of the limited programme assessments
28-29 March 2019

Colophon

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Table of contents

Summary

On 28-29 March 2019 an assessment committee of AeQui visited the Department of Industrial Design (ID) at the Eindhoven University of Technology (TU/e). The visit is part of the cluster assessment of eight degree programmes in Industrial Design Engineering at the universities of Eindhoven, Delft and Twente. This report presents the committee's findings, considerations and recommendations on TU/e's three-year bachelor programme and two-year master programme in Industrial Design. The assessment committee has used the NVAO framework 2018 for the limited assessment of existing programmes and concludes that both programmes meet all NVAO standards. It therefore issues a **positive** recommendation on the quality of the bachelor and the master programme Industrial Design at TU/e.

Intended learning outcomes
The ID Department at TU/e has a well-articulated view on industrial design and on the overall competence of an industrial design engineer. The elements that together constitute this vision are incorporated in the structure, contents and profile of the educational programmes. The various stakeholders are familiar with and committed to the principles of this vision and its operationalisation. The intended learning outcomes for both the bachelor and the master programme in Industrial Design are adequate. They reflect the provisions of the domain specific reference framework and in their formulation they refer to disciplinary knowledge, skills and attitudes at the appropriate bachelor or master level. The committee judges that the bachelor and the master programmes Industrial Design **meet the standard.**

Teaching-learning environment
The bachelor and master programmes Industrial Design at TU/e are embedded in a strong teaching and learning environment, which in turn reflects the mission and educational vision of the Department. Both programmes were reorganised three years ago: the new structures are adequate and allow students to become the kind of designer they envisage. The teaching staff is qualified to teach and guide students and has an adequate command of the English language. The study association LUCID advances the educational activities. The facilities in the new building are impressive. Students, staff and alumni are committed to the programmes and the Department. The committee judges that the bachelor and the master programmes Industrial Design **meet the standard**.

Student assessment
Student assessment in the ID programmes is well organised: the assessment system has been aligned with university-wide requirements yet preserves the values that underlay the Department's commitment to competence-centred learning. Individual course and project assessments are valid, reliable and transparent; formative assessment is an integral part of evaluation. The Examination Committee is on top of its tasks; its individual members, as well as ID staff in charge of assessment and quality assurance, are competent and committed. The evaluation of the final bachelor/master projects is robust: the rubrics establish to what extent end-level qualifications are achieved and the evaluation form allows for insightful assessments. The committee judges that the bachelor and the master programmes Industrial Design **meet the standard.**

Achieved learning outcomes
The intended learning outcomes of the respective ID programmes are eventually achieved at the end of the bachelor and master curriculum. The sample of reviewed final bachelor projects shows that the quality varies but is overall sufficient. The final master projects fully meet the quality expectations. Surveys and testimonials from alumni demonstrate that ID students are well qualified to pursue a follow-up study or enter the labour market. The final projects of students and the professional careers of alumni reflect the values, ideas and beliefs of the ID Department. The committee judges that the bachelor and the master programmes Industrial Design **meet the standard.**

Recommendations

Notwithstanding its positive conclusion that both programmes meet the four NVAO standards, the committee noticed that there is still room for improvement on individual components of the respective programmes. The committee therefore issues the following recommendations:

- to have the Department's vision on ID reflected more in the intended learning outcomes of the respective programmes;
- to monitor that both curricula constitute an operational translation of the programmes' intended learning outcomes;
- to offer ID students the opportunity to engage in multi-disciplinary projects with peers and experts from other domains as part of their curriculum;
- to consider offering basic skills courses in the bachelor programme;
- to organise activities in the master programme that enhance the community feeling among all students, both those who are new to TU/e and ID bachelor graduates;
- to enhance the quality of the information provision among students and staff;
- to communicate on the (unique selling propositions of the) programmes towards industry and other relevant labour market stakeholders;
- to have the final project evaluation, including the corresponding form, reflect explicitly the involvement, appreciation and independence of each examiner in the assessment process;
- to ensure that all students pay sufficient attention to data collection and analysis in the final project;
- to stipulate the requirements each final (bachelor) project has to fulfil in order to pass the final assessment.

In sum, both the bachelor programme and the master programme Industrial Design meet each of the four standards of the NVAO assessment framework. Hence, the panel recommends NVAO to issue a positive conclusion regarding the bachelor programme Industrial Design and the master programme Industrial Design of the Eindhoven University of Technology.

On behalf of the entire assessment committee,

Utrecht, June 2019

Anton de Goeij   Mark Delmartino
Chair   Secretary

Introduction

Since 2002, the Department of Industrial Design at TU/e is offering a bachelor and since 2005 a master programme in Industrial Design to educate engineers who combine technological opportunities with societal and user needs in creating intelligent products. Over the years, the degree programmes have been adjusted to reflect developments in the Department and the University and in 2015-2016 a major curriculum reform was carried out. This assessment therefore concerns a bachelor and a master programme that incorporate new challenges and opportunities and yet build further on long-standing values, ideas and beliefs that constitute the 'Eindhoven way' of Industrial Design.

The institute

The Technische Hogeschool Eindhoven was founded in 1956 by industry, local government and academia. Over the years, the Hogeschool has developed into a research university specialized in engineering science & technology. Now, the Eindhoven University of Technology features 9 Departments, more than 11000 students and well over 3000 research and support staff.

The University's educational mission is to educate engineers who can make significant and innovative contributions to society throughout their entire professional career. TU/e strives for excellence by connecting research and education, offering small-scale education in a master-apprenticeship model, stimulating entrepreneurship, and developing technological innovation in cooperation with industry.

With a view to the future, TU/e has implemented a major educational reform in 2015-2016. The existing degree programmes are now incorporated in a Bachelor College and Graduate School, respectively. In the Bachelor College, students can design their own curriculum within the framework of 14 bachelor majors, which allows them to compose a personal education programme that is as broad or as deep as they want. Mentors guide students in making decisions, and the College's basic courses and multidisciplinary team projects create engineers who can look beyond their own fields and engage with society.

The Graduate School offers 21 master programmes with a similar freedom for students to tailor their curricula. The Graduate School also offers the possibility to continue with a four-year PhD programme or a two-year Professional Doctorate in Engineering.

The programmes

TU/e's Department of Industrial Design (ID) was established in 2000 in order to develop a curriculum that would lead to a new type of engineer capable of combining technological opportunities with societal and user needs in creating intelligent products. Since their inception in 2002, the bachelor and master programmes in ID can be distinguished by their focus on designing with the latest technologies, on interactive and intelligent systems, products and related services, and on self-directed and competence-centred learning. The current mission of the Department is: 'research on and education in the design of systems with emerging technologies in a societal context'.

Throughout the years the Department and the degree programmes have evolved considerably. Since the previous accreditation visit in 2014, the bachelor and master curricula have been further aligned with the departmental research programme and the requirements of the newly created university-wide Bachelor College and Graduate School.

At the time of this assessment visit (spring 2019), the two ID programmes are in their third year of implementation following a major transformation

in 2015-2016. The contents of the degree programmes involve the diverse academic domains that are directly linked to the discipline of industrial design. The specific Expertise Areas reflect the overall Eindhoven profile, the Department's mission and the expertise of the faculty: Creativity and Aesthetics; Technology and Realisation; User and Society, Math, Data and Computing; Business and Entrepreneurship. These five areas are all linked to a sixth area, Design and Research Processes.

The accreditation assessment concerns a three-year full-time bachelor programme in Industrial Design (180 ECTS) that offers ample room for individual curriculum tailoring within one set of intended learning outcomes. Since 2012 student enrolment has increased from 162 to 232. Following this intake in 2017, it was decided to introduce a selection procedure and a *numerus fixus* as of 2018-2019 to safeguard the quality of education and contain the workload of the teaching staff.

Furthermore, the assessment committee evaluates the two-year full-time master programme in Industrial Design (120 ECTS), where students specialise in two Expertise Areas and focus on a future career as researcher, developer or entrepreneur in the field of Industrial Design. Apart from a temporary drop in enrolment around the time of the curriculum transformation, the intake of master students has almost doubled from 37 in 2012 to 72 in 2017.

When setting up the Department and the degree programmes a conscious decision was made to adopt the English name of Industrial Design for the new Department and to use English language in all educational programmes and communication. As of 1 January 2020, the wider TU/e will switch to English as lingua franca. Language should not be an obstacle, but rather a means of strengthening the TU/e community.

The assessment

The Department of Industrial Design at Eindhoven University of Technology assigned AeQui VBI to perform a quality assessment of its bachelor and master programmes Industrial Design. This assessment takes place in the framework of a broader exercise: in spring 2019 a cluster of eight Industrial Design programmes from three universities (TU Eindhoven, TU Delft and U Twente) is assessed by a panel of domain and industry experts including an ID student. In close co-operation with the three institutions, AeQui convened an independent and competent assessment committee that was eventually validated by NVAO. The assessment committee is presented in Attachment 1 to this report.

AeQui organised a preparatory meeting with representatives of the respective departments / faculties and degree programmes to exchange information on the organisation and implementation of the visit, as well as on the timing and contents of the supporting materials. The site visit to TU/e was carried out on 28 and 29 March 2019 according to the programme presented in attachment 2.

In the run-up to the site visit, the assessment committee studied the self-evaluation report prepared by the ID Department and reviewed for each programme a sample of theses accepted during the past two years. The experts' impressions on the report and the results of the thesis review served as input for discussion during the visit. The materials put at disposition by the Department prior to and during the visit are listed in Attachment 5.

The committee has assessed the programmes in an independent manner; at the end of the visit, the chair of the assessment committee presented the initial findings of the committee to representatives of the programmes and the Department. This report was prepared after the site visit and contains in a systematic way the committee's findings, considerations and conclusions accord-

ing to the 2018 NVAO framework for limited programme assessment. A draft version of the report was sent to the ID programme management at TU/e; its reactions have led to this final version of the report.

The NVAO assessment framework includes a Development Dialogue. The three institutions involved in the Industrial Design cluster have decided that this dialogue will take place a few months after the site visit. The results of this development dialogue have no impact on the findings, considerations and recommendations expressed in this report.

1. Intended learning outcomes

The ID Department at TU/e has a well-articulated view on industrial design and on the overall competence of an industrial design engineer. The elements that together constitute this vision are incorporated in the structure, contents and profile of the educational programmes. The different stakeholders are familiar with and committed to the principles of this vision and its operationalisation. The intended learning outcomes for both the bachelor and the master programme in ID are adequate. They reflect the provisions of the domain specific reference framework and in their formulation they refer to competencies as integrated capabilities in disciplinary knowledge, skills and attitudes at the appropriate bachelor or master level. However, the committee considers that the 'Eindhoven vision on ID' can be reflected more prominently in the intended learning outcomes of the respective programmes. According to the assessment committee, the bachelor and the master programmes Industrial Design meet this standard.

Findings

Mission and vision

TU/e's Department of Industrial Design (ID) was established in 2000 in order to develop a curriculum for a new type of engineer. This new type of engineer would combine technological opportunities with societal and user needs in creating intelligent products. Throughout the years, there have been considerable changes in the organization and education policy of the Department. The self-evaluation report contained an extensive and highly informative chapter on the set-up and development of the Department and its educational transformations, which in turn provided the assessment committee with a clear and comprehensive introduction to the (history of the) ID Department at TU/e.

The committee also gathered from the materials and the discussions that, in spite of the adaptations to new challenges and opportunities, the Department maintained its values, beliefs and identity. Since their inception in 2002, the ID bachelor and master programmes have focused on designing with the latest technologies, on interactive and intelligent systems, products and related services, and on self-directed and competence-centred learning. By embedding this approach in an 'ecosystem of collaborative communities', the Department wants to prepare its students for a rapidly transforming society and for the challenging role of bridging society and (emerging) technology through design.

The current mission of the Department is 'research on and education in the design of systems with emerging technologies in a societal context'. It expresses what the Department stands for and places research and education at the core of its endeavours. In the past, the connections between research and education were often informal; now, the Department aims for a shift from research-inspired education to research-driven education. The committee noticed that this mission is also reflected in the goals of the respective ID education programmes: the bachelor programme supports students in becoming practitioners capable of designing systems with emerging technologies in a societal context; the master programme aims for students to become experts in a specific field related to the design of intelligent systems, products and related services in a societal context.

Domain specific reference framework

In the domain specific reference framework, the three Schools of Industrial Design Engineering (IDE) in the Netherlands (TU Delft, TU Eindhoven and University of Twente) have described the profile and labour market position of academic IDE graduates. According to this document, industry needs academically trained product designers who can integrate knowledge from different

fields of technology with human factors, see signals from the market and generate creative ideas with new solutions. An IDE graduate is therefore able to operate as an interdisciplinary designer in the field of ID. The committee learned from the self-evaluation report and the discussions on site that the profile, competencies and labour market perspective of ID graduates at TU/e are very well in line with the provisions of the domain specific reference document.

At the same time, however, the committee also noticed that the mission and educational vision of the ID Department at TU/e and the goals of its education programmes add extra flavour to the IDE graduate profile of the domain specific reference framework. First and foremost, ID bachelor and master students from TU/e are required to develop their unique vision and professional identity and demonstrate this in their portfolio and final presentation. Secondly, the IDE domains mentioned in the framework are covered in expertise areas that are targeted by the Eindhoven profile and mission of designing systems with emerging technologies in a societal context. Thirdly, the design projects that are at the core of all IDE curricula are prominently present in the Eindhoven programmes: they last one semester each, every design challenge is rooted in an authentic context, the design process is tailored to the specific conditions, and each project focuses on prototyping and learning by doing.

Intended learning outcomes
The committee understood from the self-evaluation report and the study guide that the ultimate aim of the Eindhoven educational programmes is to develop an overall competence of design. This overall competence combines vision, professional identity and individual competencies, which are unique and integrated sets of attitude, skills and knowledge from the different areas of expertise. The competency framework is described extensively and very informatively in the programme materials. The committee noticed during the visit that this framework was well known to all inter-

viewees and thoroughly embedded and operationalised in the different aspects of the educational programmes, rather than a bureaucratic or publicity document.

The intended learning outcomes of the bachelor and master programmes are listed in Attachment 3 to this report. The committee noticed that the learning outcomes have been formulated in alignment with the competence areas explicated in the domain specific reference framework. The structure of both sets of learning outcomes is very similar, yet with a clear distinction in orientation and level between the final qualifications of a bachelor and a master student.

As a reaction to the previous accreditation report, the Department decided to use the intended learning outcomes of the two programmes as a frame for compiling expertise area rubrics, which in turn are used as a starting point to construct learning objectives and course specific learning goals and assessment criteria. The panel has looked into these rubrics and acknowledges that these indeed refer to and demonstrate progression in learning from bachelor year 1 up to master year 2.

Considerations
Based on the written materials and the discussions on site, the committee considers that the ID Department has a well-articulated view on design. This view has been maturing over time and is expressed in the current mission and educational vision of the Department.

Since the previous accreditation visit in 2014, the Department has adjusted its internal organisation and its educational programmes to reflect developments at university level and respond to demands from industry and society. The committee thinks highly of the way the Department managed to transform these challenges into opportunities while remaining faithful to its underlying values, ideas and beliefs.

The fundamental building blocks of the Department's mission and vision on industrial design – i.e. competence centred and self-directed development, diversity, learning through doing, community, research-driven education, efficiency, employability - have been translated into the structure, contents and profile of the ID bachelor and master programme. The committee finds it a particular strength of ID education at TU/e that during the site visit all stakeholders were aware of – and committed to - these building blocks.

The committee considers that the intended learning outcomes for both the bachelor and the master programme are adequate. The learning outcomes reflect the provisions of the domain specific reference framework for academic IDE programmes. Moreover, each set of learning outcomes is formulated in such a way that they refer to disciplinary knowledge, skills and attitudes at the appropriate bachelor and master level, respectively.

According to the committee, the ID educational programmes at TU/e are unique in developing an overall competence of design that emphasises the ambition for students to acquire a professional identity and a personal vision. While this comprehensive vision on industrial design is reflected in the educational programmes and the respective graduate profiles, it has not yet found its way completely into the intended learning outcomes. As the intended learning outcomes are currently formulated in an adequate yet generic way, the committee invites the Department to explicate its unique vision more prominently in the intended learning outcomes.

Based on the interviews and examination of the underlying documentation, **the assessment committee concludes that the bachelor and the master programmes Industrial Design meet standard 1, intended learning outcomes.**

2. Teaching-learning environment

The bachelor and master programmes Industrial Design at TU/e are embedded in a strong teaching and learning environment, which in turn reflects the mission and educational vision of the Department. Both programmes were reorganised three years ago: the new structures are adequate and allow students to become the kind of designer they envisage. The teaching staff is qualified to teach and guide students. The study association advances the educational activities. The facilities in the new building are impressive. Students, staff and alumni are committed to the programmes and the Department. Nonetheless, the educational transformation has not yet been fully completed: the curricula and their respective courses can be fine-tuned to better reflect the programmes' intended learning outcomes. Moreover, there is room for better information provision internally and for a more explicit communication on the programmes and programme tracks towards industry. According to the assessment committee, the bachelor and the master programmes Industrial Design meet this standard.

Findings
Programme
The ID Department at TU/e was established in 2000 and is offering a bachelor and a master programme since 2002. Right from the start, the language of instruction has been English. The committee learned that when setting up the Department and the degree programmes, a conscious decision was made to adopt the English name of Industrial Design for the new Department and to use English language in all education programmes and communication. As of 1 January 2020, the wider TU/e will switch to English as lingua franca. Language should not be an obstacle, but rather a means of strengthening the TU/e community.

Over the past five years several developments at departmental and university level impacted on, and required a thorough revision of, the educational programmes: the financial support for the set-up of the Department was suspended earlier than anticipated; the programmes had to be adapted in order to fit the newly introduced university-wide structures of the Bachelor College and the Graduate School; and the growing number of students and declining second and third tier research funding required a more efficient educational model.

The committee gathered from the written materials and the discussions on site that while the underlying values, beliefs and ideas of the Department and the ID programmes have been maintained over time, the considerable transformations at programme level mean that the two ID programmes are currently only in their third year of implementation following a complete overhaul of the curricula in 2015-2016.

The committee acknowledges that the current ID bachelor and master programmes are well aligned and designed as a three-year plus two-year learning path. The bachelor programme creates an awareness of the field of industrial design and trains students to act, under guidance, as industrial designers on assignments of limited complexity. The master programme coaches students further towards becoming independent ID professionals. The programme contents mirror the various academic disciplines that are directly linked to the ID domain. The specific expertise areas reflect the overall TU/e profile, the Department's mission and the expertise of the teaching staff: creativity and aesthetics; technology and realisation; user and society, math, data and computing; business and entrepreneurship. These five areas are all connected to a sixth area, design and research processes.

Bachelor curriculum

The three-year full-time bachelor programme Industrial Design supports students in becoming practitioners who design systems with emerging technologies in a societal context. The first year builds an awareness of the expertise areas in ID; in the second year students learn various design and research approaches and expand their competencies in the different areas of expertise; the third year is dedicated to strengthening the students' professional identity and vision and to demonstrating their overall competence of design. Attachment 4 to this report contains an overview of the bachelor curriculum, which amounts to 180 ECTS.

The bachelor curriculum is structured in such a way that it fulfils the requirements of the university-wide Bachelor College, as well as the elements stipulated in the domain specific reference framework for academic industrial engineering programmes. All TU/e bachelor students must complete five generic engineering courses, and develop professional skills (30 ECTS). As part of the elective space students must also select at least one User Society Enterprise (USE) course sequence (15 ECTS). Eight core design courses form the basis of the Eindhoven Industrial Design Engineer (40 ECTS). Projects (50 ECTS), including the 'thesis', i.e. the final bachelor project form the backbone of the ID programme. Students can self-direct their learning by choosing from a diverse range of projects in so-called 'squads', collaborative communities that share an interest in a specific application domain. Elective courses (45 ECTS) offer students a controlled context to broaden, deepen or improve the knowledge and skills base in the expertise areas. Students who are on track when they enter the third year may replace five electives in the fifth semester with an internship, exchange or minor (25 ECTS).

The committee noticed that overall the curriculum is built in a coherent way and in full respect of the requirements of the University, the IDE academic domain and the research specialisations of the Department. Furthermore, the curriculum

does justice to the educational principles of competence-centred and self-directed learning. With regard to the latter, it struck the committee that first year bachelor students already have two elective courses, for which they can choose between a set of 17 ID courses. Several students and alumni indicated during the visit that they appreciate this room for individual curriculum tailoring, including at the very start of the curriculum. In their written contribution to the self-evaluation report, bachelor students emphasised that a curriculum that offers them the opportunity to become the kind of designer they envisage is particularly attractive. This attractiveness does not only apply to the TU/e bachelor students but extends to bachelor graduates from other universities who decide to enrol for the ID master programme at Eindhoven.

Furthermore, the committee heard in the discussion with students that the overall workload is acceptable: courses usually are feasible, while project work can be time consuming. Students who have the ambition to excel in the programme tend to spend much more time on the projects than the envisaged study load. Asked for potential elements of improvement, students indicated that the programme could inform students better about the relationship between the different types of courses and projects. Moreover, students would appreciate if the curriculum included courses on basic skills such as programming.

Master curriculum

The two-year full-time master programme Industrial Design supports students in becoming self-directed industrial design engineers who are specialised in two expertise areas relevant for the design of systems with emerging technologies in a societal context. The first-year programme provides insight into the academic field of ID and the areas and application domains in which TU/e students wish to achieve expertise. Second-year master students develop a clear competence profile with expertise in two areas that are bridged by their preferred design and research process. Attachment 4 to this report contains an overview of

the master curriculum, which amounts to 120 ECTS.

The master curriculum is structured in such a way that it fulfils the requirements of the university-wide Graduate School, as well as the elements stipulated in the domain specific reference framework for academic industrial engineering programmes. The curriculum features one compulsory course, Constructive Design Research: besides an introduction to the Department's research groups, topics and theories, first-year master students get accustomed with the three dominant design research approaches of leading research communities: lab, field and showroom. After the first semester, students choose one of three master tracks, which define their professional focus after graduation:

- Constructive Design Research is oriented towards academic research in ID;
- Research, Design and Development focuses on a R&D or design career in industry;
- Design Leadership and Entrepreneurship focuses on the creative industries sector and includes an entrepreneurship dimension.

The committee noticed that also the master programme curriculum is built in full respect of the requirements of the University, the IDE academic domain and the research specialisations of the Department. The master curriculum provides students with even more freedom to self-direct their learning. The programme tracks are very important: they define what students will be doing in the (final master) projects and inform the professional field of the particular competencies of the ID master graduate as design researcher, design engineer or design entrepreneur.

The discussions with management, staff, students and alumni made clear to the committee that the above-mentioned transformations have had a considerable impact on (the attractiveness of) the master programme. At some point, TU/e students experienced the bachelor programme as quite chaotic because of the many changes and did not see the alignment (anymore) between the bachelor and master programme. As a result, several bachelor graduates moved to ID master programmes at other universities. The master programme is now recovering from this dip in inflow, partly due to the growing number of incoming bachelor graduates from other universities in the Netherlands and beyond. New master students enrol because they are given substantial freedom in tailoring the curriculum to their ambitions and are attracted by the interactive aspects of the study.

Furthermore, the committee learned from the discussion with students that the overall workload is feasible: given that the study is full-time, students recognise that they have to put in a full-time commitment if they want to finish the programme successfully and in time. Asked for potential elements of improvement, students, alumni and the work field indicated that ID students have only limited opportunities in the curriculum to work in multidisciplinary teams with experts from domains outside design. Moreover, master students who are new to the 'Eindhoven way of working' would like to receive more guidance on how to tailor the curriculum in an optimal way. Furthermore, the community feeling, prominent among bachelor students, is apparently difficult to establish among (newly enrolled) master students. The study association LUCID, which traditionally has focused primarily on the bachelor community, is considering to involve more explicitly pre-master students and master students from other universities in their activities.

Educational approach
The committee became aware from the written materials and the discussions on site that both the bachelor and the master programme are delivered in line with the principles that underlie the educational vision of the Department. The concepts of competence-centred development, self-directed learning, diversity design, learning through doing and community building have been described extensively in the self-evaluation report and the study guide. The committee

learned moreover that these principles are not only concepts to guide the educational programme design, but are also operationalised in the day-to-day delivery of the two curricula.

The committee noticed that the curricula are not only coherent in contents, but also in structuring the learning activities. Learning starts and ends with the professional identity of a student – the personal traits, characteristics and ambitions. The self-evaluation report describes in a convincing way that at ID learning is considered a layered process. Learning outcomes are related to and integrated in levels of professional identity and vision. This in turn ensures that the learning results are sustainable and that choices for courses and projects are coherent with the personal ambitions of individual students.

A particular feature of the learning environment at TU/e is the ''Squad''. The ID Department features ten squads directly linked to current research strongpoints that each offer design projects for different application domains and within specific contexts. Each squad brings together academic staff members, experts from practice, PhD candidates, master and bachelor students. From their second year bachelor students decide on their intended expertise development and choose a staff member who will guide them in this process. The squads channel the learning processes of bachelor students through both horizontal and vertical peer learning. Master students may choose a continued association with a squad; their projects will then have a strong connection to the research interests of their mentor, the external client for which they work or their (intended) start-up. This may, however, make it a challenge for those master students who like to specialize outside of the 10 squad themes.

Intake
The intake of bachelor students increased from 162 in 2012 to 232 in 2017. In order to safeguard the quality of education and contain the workload of the teaching staff, it was decided in 2017 to introduce a selection procedure and a *numerus*

fixus as of 2018-2019. The selection procedure is based on a distinct set of criteria, including the average grade in high school and the participation in selection activities.

Students with an ID bachelor degree from Eindhoven, Delft or Twente or a BSc Creative Technology from Twente have direct access to the ID master programme. All other students must request admission from the Departmental Admission Board. Students with a relevant bachelor degree from a University of Applied Sciences can enrol in the pre-master programme which consists of a design (research) project and four elective courses.

Apart from a temporary drop in enrolment around the time of the curriculum transformation, the intake of master students has almost doubled from 37 in 2012 to 72 in 2017. The committee was struck by the fact that the number of TU/e bachelor graduates exceeds by far the total intake of master students. According to the ID management, some bachelor graduates decide, based on a personal vision and professional identity which they acquired at TU/e, that their future is with another specialism offered by a different programme or University. Others decide to enter the labour market or establish their own company right away. The committee acknowledges this response on the one hand as a positive indication that the bachelor programme succeeds in its ambition; on the other hand the findings also indicate that the ID management needs to monitor its current programme offer and ensure that the master programme has enough added value for TU/e bachelor graduates.

Staff
According to the self-evaluation report, the ID Department at TU/e features 231 staff (headcount), which amounts to 169 full-time equivalents. The total staff figure includes 47 professors, 92 PhD students and 60 support staff. The committee appreciated that the ID teaching staff are facilitators of student learning and as such act in different roles: project coaches guide students in

project-work; (bachelor) teacher coaches and (master) mentor coaches support and challenge the student's self-directed development in professional identity and vision; lecturers offer expertise in the core design courses and electives. Most teaching staff is also researcher in one of the two capacity clusters and a squad member in one of ten squads.

Full time staff spend 50% on research, 40% on education and 10% on management. Since the transformation, the Department has moved to dedicated weekdays for education: one day per week on project/mentor/teaching coaching and one day per week on lecturing. Moreover, the Department strives for quality in education: it abides by the TU/e policy regarding the teaching qualification for university teachers; holding such qualification is part of the promotion and tenure criteria.

The committee learned during the discussions on site that staffing has changed drastically since the previous accreditation visit. Previously a considerable part of the teaching was organised through part-time external professional designers. Due to budgetary cuts imposed by the University, their involvement has been replaced by (a more limited number of) permanent academic staff. Students are overall satisfied with the domain specific knowledge and didactic skills of the teaching staff. Nonetheless, they also reported that not every area of expertise is covered to a similarly high extent. The Department acknowledges that the (centrally required) focus on research diminishes the quality of education on topics that are relevant but not in the primary research interest of the Department, such as business, entrepreneurship or sustainability. The committee was informed by the Department that part of the missing expertise is available through collaborative projects with industry and by more personalised attention to student development in the squads. Students, however, indicated that projects and individualised attention are helpful but not always sufficient in terms of know-how transfer.

Facilities
Since January 2019, the ID Department is situated in the newly renovated Atlas building on the TU/e campus. The committee visited the new facilities and noticed that these are set up very well in line with the ID educational model: open spaces offer plenty of opportunities to communicate and network. To enhance the sense of community, the squads are located in studio spaces in close proximity to the Generic Make, Specific Make and Research Labs. Moreover, master students in their final project stage have work places nearby the academic staff, which facilitates supervision, interaction and feedback.

In 2016 several systems were introduced to facilitate student planning and course choices in bachelor and master programmes: Canvas is the TU/e learning management system, Osiris is the student information system, and PlanApp is a newly developed tool to help students submit the profile choices proposals to the Examination Committee.

The discussions on site revealed that the study association LUCID plays an important role in ID education as it offers a complementary range of courses and workshops involving alumni and the professional field. Moreover, student mentors help first-year bachelor students, as well as premasters, in developing a professional identity and vision. Students are positive about the new facilities, the student-centred approach of the education programmes and the study association.

Considerations
Based on the written materials and the discussions on site, the committee considers that the teaching-learning environment is well developed at the ID Department in Eindhoven. This appreciation applies to the bachelor and the master programme, the quality of the staff and the relevance of the programme-specific facilities.

The committee acknowledges that the educational programmes under review are the result of

a transformation that was imposed by circumstances beyond the Department's control. Although it recognises that the educational reorganisation has not yet fully matured, the committee notices that the two programmes have reached a level of implementation that is highly satisfactory.

The committee considers that both programmes are well structured and feature a coherent combination of courses and projects. The curricula reflect the educational principles of the Department by offering ample opportunities for students to make choices and become the kind of designer they envisage. The committee thinks highly of the way in which the Department's shift towards research-driven education is reflected in the structure of the curriculum by master tracks and by projects performed in squads. Nonetheless, the programme management may want to monitor that the curricula also remain an operational translation of the programmes' intended learning outcomes. Furthermore, the committee considers that both bachelor and master students have raised a number of curriculum-related issues that are worth addressing and therefore invites programme management to look critically into basic skills courses for the bachelor programme, community enhancing activities in the master programme and opportunities for multidisciplinary project work in both programmes.

According to the committee, the ID Department has sufficient and properly qualified staff at disposition, who have an adequate command of the English language according to students. The combination of teaching staff, educational support staff, PhD students and student mentors allows for a smooth organisation of both programmes. The committee is convinced that students can be properly informed and counselled during the dedicated working days for education by teaching staff operating in different roles. If anything, there could be more business and entrepreneurial expertise on the side of lecturers in order to prepare students (even) better for the labour market.

The committee is impressed by the facilities in the Atlas building as they reflect the educational model of the Department. It highly appreciates the role of the study association LUCID in the programmes, in particular in advancing the educational activities. Moreover, the study visit demonstrated that the programmes and ID Department can rely on a strong commitment from students, staff and alumni.

Throughout the visit, the committee obtained the clear impression from interviews with different stakeholders that the information provision is not entirely up to par. While the quality of the communication may have been hampered by the consequences of the educational reorganisation, the committee also noticed that a lot of communication is implicit, which in turn makes it difficult for students and staff to fully come to grips with the (new) curricula. The committee therefore invites the Department and the programme stakeholders to pay attention to enhancing the quality of its communication.

Based on the interviews and examination of the underlying documentation, **the assessment committee concludes that the bachelor and the master programmes Industrial Design meet standard 2, teaching-learning environment.**

3. Student assessment

Student assessment in the ID programmes is well organised: over the years the assessment system has been aligned with university-wide requirements while preserving the values, beliefs and ideas that underly the Department's commitment to competence-centred learning. Individual course and project assessments are valid, reliable and transparent; formative assessment is an integral part of evaluation. The Examination Committee is on top of its tasks; its individual members, as well as ID staff in charge of assessment and quality assurance are competent and committed. The assessment of the final bachelor/master projects is robust: the rubrics establish to what extent end-level qualifications are achieved and the evaluation form allows for insightful assessments. Nonetheless, the evaluation and its corresponding form could reflect more explicitly the involvement, appreciation and independence of each examiner in the assessment process. According to the assessment committee, the bachelor and the master programmes Industrial Design meet this standard.

Findings

Assessment system

The Department's assessment policy has been adjusted considerably in recent years. Two elements have triggered the adjustments: the analysis by the previous accreditation committee and the educational changes at university level. While acknowledging the good match of the assessment system in place at that time with the educational concept, the previous committee saw room for improvement in a better documentation and greater transparency of the holistic assessment process. Moreover, the changes in the educational structure decided upon at university level required a substantial revision of the ID curricula and their corresponding assessment system.

The current assessment committee observed from the written materials and the discussions on site that the Department has gone at lengths to address the above-mentioned recommendations and developments, while at the same time preserving the values, beliefs and ideas that underly its commitment to competence-centred learning. The committee noticed that the constituting elements of the current assessment system and process are described in good detail in the ID Assessment Policy document. Moreover, the discussions on site demonstrated that both staff and students are very much aware of the assessment system

and its concrete operationalisation in courses and (final) projects.

One important novelty is the adoption of rubrics as an assessment tool for all educational activities: using rubrics allows an increase in the transparency of the assessment criteria while leaving enough flexibility to do justice to the diversity of the students' profiles, projects and approaches. The rubrics have been created in a deliberate process of backwards engineering: the end terms of the final bachelor and master projects were used as reference for compiling expertise area rubrics and for formulating course specific rubrics, assessment criteria and standards for competency assessment. The panel noticed when reviewing the Assessment Rubrics Booklet, which was annexed to the self-evaluation report, that the ID Department has put major efforts in setting rubrics and in aligning the evaluation criteria per project and across the two curricula. Throughout the projects, ranging from bachelor year 1 until the final master project, assessment rubrics address the students' (i) overall competence of designing; (ii) scientific and professional skills; (iii) professional identity and vision; and (iv) development in ID expertise areas.

The ID programmes consist of courses and projects featuring both formative and summative assessments. Courses are assessed using a grading scale of 1-10 whereby examinations often include a combination of written tests, oral presentations, written deliverables, exhibitions and physical prototypes. Student competences are assessed in projects and usually result in a verdict (hold – conditional hold – promotion – promotion with excellence) based on oral, written, digital and/or physical deliverables. Formative assessment plays an important role in project work as students receive feedback from both coaches and peers at mid-term stage and again towards the end of the project period.

Both bachelor and master students indicated during the visit that they are informed in a transparent and timely way about the learning goals, assessment types and rubrics. In line with overall TU/e policy, the digital study guide specifies for each course what, how, when and by whom will be assessed. Students are generally satisfied with the way assessment is organised: both bachelor and master students emphasised that they feel neatly judged by their assessors and that the majority of staff is doing a good job in providing feedback that is useful for students to enhance their competences and performance. Although students acknowledge that staff is very busy, staff is approachable and does make time for students, be it in class, upon appointment or at the coffee machine in the open spaces across the Department.

Asked if there were points for improvement with regard to assessment, students indicated that not all lecturers, especially those from outside the Department, stick to the rubrics when grading at the end of the course. Moreover, coaches involved in the same squad sometimes have different opinions on how students should develop. Students expressed that while such divergence in opinion may enrich the formative feedback, they find it less effective when scored on a deliverable. Several students mentioned that they do not like the grading by verdict as it is operationalised now: receiving a pass (promotion) can mean anything between 6 and 8.5 while it is very difficult to receive an excellent mark (corresponding to 9). Although students confirmed that the targets are clear (and very hard to reach in case of excellence), according to them adding a mark 'good' – in line with the rubric category 'good' - would better reflect the quality of their work and/or do justice to the effort they have put into the project.

Thesis evaluation
ID students demonstrate the achieved end level through their final bachelor and master projects. The assessment committee noticed that since the previous accreditation visit, the procedures for assessing the final bachelor and master projects have become more robust. In addition to receiving formative feedback throughout the final project period, students are assessed on their thesis and portfolio by a team of assessors using a comprehensive range of rubrics that address the four above-mentioned clusters: design competence, skills, professional identity and expertise.

Once the student has finished the final report, an assessment meeting is held which includes both a student presentation on the final project and the portfolio, and an oral examination / Q&A session between assessors and student. The assessors document their appreciation in an evaluation form that consists of set rubrics with fixed criteria. While the rubrics are set, the evaluation form does feature a feedback component where additional and individual appreciation and clarification can be provided in free text. The panel understood from the discussions that the final score is not generated by a (fixed) weighted sum of scores on different rubric items, but results from the discussion among assessors in the assessment meeting. Moreover, the score for the final bachelor project is validated in a plenary assessor meeting where the verdicts for different projects by different assessor teams are calibrated. Until last year, both bachelor and master projects were assessed by panels of two examiners appointed by the Examination Committee. In line with the

agreed procedure at university level, as of 2018-2019 the final master project will be assessed by a team of three examiners whereby both project and portfolio are assessed by at least two assessors. In this case, the mentor will look at both products and will invite the second assessor to complete the rubrics on the project and the third/external assessor to evaluate the portfolio.

As part of its thesis review, the assessment committee studied a sample of theses and corresponding evaluation forms, completed in 2016-2017 and 2017-2018. The evaluation forms reflect the above-mentioned assessment policy of ID following the major educational and assessment overhaul in 2015-2016. The panel did not yet see master project evaluations performed by three assessors.

The committee members noticed that for both bachelor and the master projects, the majority of evaluations was insightful. Using a comprehensive system of rubrics to assess a final project allows for a detailed (albeit standardized) set of appreciations on the various components of the thesis and on the achieved competences. In several cases assessors made use of the free space in the evaluation form to provide additional and individualized comments containing useful formative feedback for the student. According to the assessment committee, such combination of rubrics and feedback made the evaluation particularly insightful. Nonetheless, in a few cases such feedback was not informative or not added at all. Furthermore, in a few cases the evaluation form was missing and could not be provided upon request.

Confronted with these findings, staff and examination committee members acknowledged the absence of a small minority of evaluation forms and indicated that in the future this will no longer be possible. In fact the Department in the meantime has installed a learning management system (Canvas) in which evaluation forms will have to be stored. Moreover, the programme representatives agreed to the panel's opinion regarding the

added value of free-text feedback and indicated they would urge all final project assessors to provide such feedback in the assessment rubric.

The committee members also noticed in their final project reviews that there was only one evaluation form per student, while each student had reportedly been assessed by two examiners. This means that it was not possible to observe from the evaluation form whether each assessor had fulfilled his/her task. The panel understood from the discussion on site that the final project assessment is organized in such a way that both assessors are actively involved in reviewing the project and the portfolio and in establishing the final score. Nonetheless, the extent to which this assessment has been done independently by the two assessors and the final score is indeed the result of discussion among examiners, rather than the mentor taking the lead and the second assessor confirming the mentor's opinion. The committee has the opinion that the independent judgement of the assessors should be reflected more explicitly in the evaluation form.

Based on the thesis evaluation review and the discussion on site, the assessment committee also wondered to what extent the role of the mentor as final project supervisor and first assessor / assessment meeting chair is appropriate. While the committee acknowledges the efforts of the programme to have assessor teams for all final projects and to add a third examiner for the final master project, the central position of the thesis supervisor in the final project process is quite strong. Confronted with this finding, the examination committee and the programme management indicated that in the new procedure for the final master project, the second and third examiners should take the lead in completing the evaluation form, whereas the mentor/thesis supervisor chairs the assessment meeting. The programme representatives also mentioned they would agree to making the independent assessment position of the two/three assessors more explicit in the evaluation form.

Examination Committee

The Examination Committee of the ID Department is responsible for assuring the quality of examinations and assessments. It monitors course results in accordance with TU/e regulations and can prompt actions to develop or update procedures. The committee appoints course and project examiners, including the teams of two or three assessors for the final bachelor and master projects.

The panel gathered from the session with representatives of the Examination Committee that the individual members are rooted in the ID Department and have extensive - and certified (UTQ) - experience as lecturer and examiner. Moreover, they received training organised through the University on the legal framework for examination committees. Both chair and secretary of the examination committee participate regularly in university-wide meetings of chairs and secretaries, respectively.

Examination Committee members indicated that they have been involved in adjusting the assessment system and in ensuring that the result would meet adequate quality standards. A lot of effort has gone into setting assessment procedures for final bachelor and master projects, including the recent adjustment to implement final master projects assessed by three examiners. In order to play a more proactive role as quality assurance body, the examination committee recently installed a test committee (toetscommissie) and intends to set up a quality assurance committee (borgings-commissie) to review past assessments of final bachelor and master projects. It is in the brief of the test committee to look into the verdicts of the summative project examination to see whether an additional category 'good' is required.

Considerations

Based on the written materials and the discussions on site, the committee considers that student assessment at the ID Department of TU/e is well organised. It appreciates the efforts undertaken by the Department since the last accreditation visit and thinks highly of the results that have been attained in the meantime. According to the committee, both bachelor and master programmes managed to improve the quality of their student assessment and align it with university-wide developments and requirements while at the same time preserving the values, beliefs and ideas that constitute the Department's commitment to competence-centred learning.

The committee considers, based on its own sample review and the comments from students, that the individual course and project assessments are valid, reliable and transparent. In this regard, the committee welcomes the particular and systematic attention in both bachelor and master programme courses to formative assessment. Notwithstanding its positive appreciation, the committee invites the Department to address the concerns students expressed both in the Student Chapter and during the visit with regard to project assessment verdicts, assessment calibration and evaluation through rubrics.

According to the assessment committee, the Examination Committee is very much on top of its tasks and its individual members are both competent and committed. This appreciation also extends to the ID staff dealing in particular with assessment and quality assurance.

Furthermore, the committee acknowledges the efforts of the Department to turn the assessment of the final bachelor/master thesis project into a robust process. The rubrics used to assess the final project (thesis, portfolio and viva) ensure that students can demonstrate to what extent they have achieved the end-level qualifications at bachelor and master level, respectively. Having reviewed a representative sample of 35 bachelor and master thesis evaluations, the committee considers that the evaluation form allows for insightful assessments as it combines comprehensive and relevant assessment rubrics with room for personalised feedback.

While it has a positive impression of student assessment overall, the assessment committee did come across a few elements in the thesis review that could be improved. As the panel noticed that about 80% of the evaluation forms contained insightful comments, it encourages the programmes to ensure that all assessors complete the feedback item to underpin the final score and provide development-oriented feedback to the individual student. The committee moreover invites the Department to reflect on how the involvement, appreciation and independence of the assessors can be more accurately reflected in the final project evaluation form of both bachelor and master programme. According to the committee, the mentor/coach role and the assessor role should be separated from each other as much as possible. Therefore, the Department may also want to reflect on the double role of the mentor/coach as both thesis supervisor and assessor. Finally, the committee urges the Department to archive all evaluation forms, and make these retrievable in the future.

Based on the interviews and examination of the underlying documentation, **the assessment committee concludes that the bachelor and the master programmes Industrial Design meet standard 3, student assessment.**

4. Achieved learning outcomes

The intended learning outcomes of the respective ID programmes are achieved at the end of the bachelor and master curriculum. The sample of reviewed final bachelor projects shows that the quality varies but is overall sufficient. The final master projects fully meet the quality expectations. Surveys and testimonials from alumni demonstrate that ID students are well qualified to pursue a follow-up study or enter the labour market. In sum, it is fair to state that the final projects of students and the professional careers of alumni reflect the values, ideas and beliefs of the ID Department. Nonetheless, there is room for improvement: more systematic attention to data collection and analysis and more harmonisation in report formats and sizes would enhance the overall quality of the final projects and - in the case of the bachelor programme – facilitate more consistent grading. In view of their future career, ID students would benefit from multi-disciplinary work opportunities with peers and experts from other domains. According to the assessment committee, the bachelor and the master programmes Industrial Design meet this standard.

Findings
Final projects
ID students demonstrate that they have achieved the intended learning outcomes through their final bachelor and master projects and portfolios. In order to establish whether students do achieve these end level qualifications, the assessment committee has reviewed a sample of final bachelor and master projects/portfolios. In the run-up to the site visit, the ID Department provided an overview of the final projects that were accepted in the academic years 2016-2017 and 2017-2018. The committee made a selection of the projects to be reviewed ensuring per programme a fair distribution across scores, date of project acceptance and, where applicable, tracks and/or expertise areas.

The committee chair, domain and industry experts were each allocated a number of final theses and portfolios and their respective evaluation forms. For each set of products the committee answered four questions: (i) Is the final project of sufficient quality to pass? (ii) Do you agree to the score given by the assessors? (iii) Based on the evaluation form, is the assessment clear and insightful? (iv) Are there any particularly strong or weak elements in the execution of the final project? Moreover, having reviewed their sample of final projects, the committee members provided an overall appreciation at programme level on the quality of the final project and portfolio and on the quality/transparency of the assessment. The committee's findings on the assessment of the final projects have been described in the previous section on student assessment.

Committee members noticed that the final projects and portfolios always concern both a proto-type and a report on the research process leading up to this prototype. According to the committee, the fact that all students have to produce a prototype reflects the objectives of the ID Department and its programmes. In this regard, the committee appreciated very much the organisation of a 'mini demo day' during the meet & greet session where members could speak to graduates presenting their final project deliverable.

A second common finding across programmes is the diversity of the projects and portfolios in terms of both structure and size. Without expressing a judgement on the quality of the projects, the committee noticed that some projects and portfolios were quite limited in size compared to others and in view of the study points allocated to the final project. In other cases projects and portfolios were very extensive but often wide-ranging and descriptive. Programme staff indicated to the committee that on the one hand there are templates and briefs with regard to the size and structure of the final projects and portfolios; on the

other hand, thesis supervisors have some discretion in allowing students to deviate from the set structure and size.

The assessment committee eventually reviewed **20 final bachelor projects.** Based on its findings on 15 projects, the committee decided to enlarge the sample before coming to overall conclusions on the thesis quality. While a wide majority of projects undoubtedly met the quality levels that can be expected of a final project at bachelor level, several committee members reported that the scores given by the assessors on a range of projects and portfolios was (much) higher than what they considered appropriate. In two cases, the committee had doubts as to whether the final project should have passed right away. This finding was triggered by the fact that in two other cases, the examiners had only accepted final projects in a re-sit after the student had completed an additional assignment. The committee agreed with the assessors that these final projects had only reached the quality threshold at re-sit stage.

Considering individual strengths and weaknesses of final bachelor projects, committee members noticed that all students not only get the opportunity to choose but also have the ability to conduct a basic research project that is related to and/or relevant for design. The committee also found that the topics and research questions were interesting and allowed for diversity in the methodological approach, emphasising on either design or research. Furthermore, the committee thought that in many cases the level of prototyping effort was impressive. On the downside, committee members sometimes missed a critical attitude in the report towards the students' role in the company and performance during the internship. Moreover, in a few cases final projects did not include much information about the qualitative data collection, the analysis of these data and the research results.

The assessment committee reviewed **15 final master projects.** Committee members reported that in all cases the final projects reflected a quality level that is commensurate with what can be expected of a final project at master level. The committee agreed to almost all scores, reporting only in two cases that they thought the examiners' verdict was somewhat higher than their own score. The committee reviewed one thesis which only passed after a re-sit and found that in this case, the scoring and motivation in both exam and re-sit were meticulous.

Considering individual strengths and weaknesses of final master projects, committee members noticed the diversity in often interesting topics and research approaches. In most cases students demonstrated a good understanding of the research problem, the literature and the relevant methodologies. Often the quality of the writing was high. On the downside, the committee noticed some discrepancy between projects with a clear design focus and projects with an explicit research focus. While both project types are fine, students could be guided more in terms of structuring the project outcomes and drafting the report. In a few cases, the (reporting on the) data collection and analysis was not particularly extensive. Furthermore, some projects with a design focus could have paid more explicit attention to the knowledge component.

Employability of graduates
In addition to verifying the quality of the final deliverables, the labour market performance of graduates is another way to establish whether students achieve the intended learning outcomes upon completion of the programme. The committee gathered from the materials and the discussions on site that overall students do not only have a positive opinion on their ability to pursue a follow-up study or a professional career, but are also effective in their education or employment career. According to the Alumni Monitor 2017, the majority of ID master graduates finds suitable employment within three months. Recent LinkedIn data show that the majority of bachelor graduates continue to study either in Eindhoven or at other universities, while almost one in four

graduates enters the labour market to either work at a company or start a business. Another survey showed that recent MSc graduates are now employees (65%), on a PhD trajectory (5%), or entrepreneurs (13%).

Students and alumni appreciate in particular the Department's emphasis on self-directedness, professional identity and the project work in squads. One alumnus mentioned during the visit that he realises now, after his studies and well into his first job, that ID graduates from TU/e "can do way more than we think". This consideration was confirmed by all other alumni interviewees. Moreover, alumni indicated that because ID students at TU/e have quite some freedom and are used to express their own vision during the curriculum, graduates afterwards look for their own space and freedom in a corporate environment. These features in combination with the business and entrepreneurship track make that several students move into self-employment and entrepreneurship quite soon after their graduation.

Both bachelor and master students indicated in the student chapter and during the visit that the transition from education to employment could be facilitated by two elements: more business expertise on the side of (some) lecturers and better communication on what Industrial Design stands for in the labour market. With regard to the latter point, several students indicated that companies are looking for people with the ID competencies as offered at TU/e, but are not recruiting under the nametag of Industrial Design. Alumni agreed on the one hand to the nametag issue; on the other hand, they also noticed that companies, and in particular small- and medium-sized enterprises, tend to recruit industrial designers from TU/e because they are multi-deployable. Finally, the committee observed from the individual testimonies of students, alumni and employers that ID students learn to work in groups but have no experience in working with peers from other domains.

Considerations

Based on its final project review and the discussions on site, the committee considers that students who graduate from the ID bachelor and master programmes are adequately prepared for a follow-up study or a position on the labour market. It is fair to state that the intended learning outcomes of the respective programmes are eventually achieved at the end of the bachelor and master curriculum.

Taking the final project as a key performance indicator for this standard, the panel considers that in so far as the **bachelor programme** is concerned the thesis quality is overall sufficient and in many cases quite strong. The committee appreciates in particular that students demonstrate through the project and portfolio that they can conduct research in connection to designing a prototype. Without affecting its overall appreciation, the committee considers that the quality of the final bachelor projects could be enhanced by adopting more systematically the existing regulations for size and format of the project and portfolio. The committee moreover encourages thesis supervisors to (monitor that students) pay more attention to data collection and analysis. In terms of scoring, the committee recommends the bachelor programme to stipulate the minimum requirements each final project has to fulfil in order to pass straight away, i.e. without being considered for a re-sit.

With respect to the **master programme** the panel considers that the thesis quality meets the expectations. The committee appreciates the attention to both prototype and research. More-over, students demonstrate proper ability to stipulate the research problem, identify relevant literature and adopt the appropriate methodology. In order to enhance (even) further the quality of the final master projects, the assessment committee considers that existing regulations on size and format could be applied more strictly. The panel also encourages thesis supervisors to monitor that all

(not merely most) master students pay explicit attention in their reports to data collection, data analysis and the knowledge component.

With regard to the other key performance indicator for this standard, the assessment committee considers that both bachelor and master graduates are very well qualified to pursue a follow-up study or enter the labour market. Following its lively interview with alumni, the committee fully understands why ID graduates from TU/e need some freedom in their job and relatively often become entrepreneurs. The committee encourages

the ID Department to look into the issues raised by students and alumni on 'selling' the Industrial Design label to employers and on providing opportunities for multi-disciplinary work in the curriculum.

Based on the interviews and examination of the underlying documentation, **the assessment committee concludes that the bachelor and the master programmes Industrial Design meet standard 4, achieved learning outcomes.**

Attachments

Attachment 1. Assessment committee

Anton de Goeij, panel chair
Anton is emeritus professor Curriculum Development at Maastricht University. He has an extensive track record in international consulting and implementing curriculum development trajectories.

Saeema Ahmed-Kristensen, domain expert
Saeema is Head of Design Products, and a Professor of Engineering Design at Royal College of art, she was the deputy-head of the Dyson School of Design at Imperial College London.

Jacob Buur, domain expert
Jacob is Research director of SDU Design at the University of Southern Denmark. He studied Electrical Engineering at the Technical University of Denmark and obtained a PhD from that same institution.

Ann Heylighen, domain expert
Ann is full professor at the faculty of Engineering Science, Department of Architecture at KU Leuven (Belgium).

Carlijn Compen, industry expert
Carlijn is Head of Design at Océ Technologies in Venlo.

Rens de Graaf, student-member
Rens is studying at the Industrial Design Engineering faculty at TU Delft.

Attachment 2. Programme of the assessment visit

Venue: Atlas building, lecture room 3.201, Tu/E campus

Thursday 28 March 2019
11.30   Arrival panel

11.45   Internal panel meeting

14.00   Meet & Greet
- Guided tour through Atlas building and Industrial Design facilities
- Mini demo day
- Presentation study association Lucid

15.00   Session with Management Team

16.15   Session with Examination Committee

17.15   Session with alumni and industry representatives

18.15   Internal panel meeting (until 19.15)

Friday 29 March 2019
08.30   Open consultation hour

09.30   Session with bachelor students

10.30   Session with staff bachelor programme

11.30   Session with master students

12.15   Lunch and internal meeting

13.30   Session with staff master programme

14.30   Final session with Management Team

15.00   Internal meeting panel

17.30   Plenary Feedback

18.00   End of assessment visit

Attachment 3. Final qualifications

Bachelor of Science graduates of the degree programme Industrial Design:
- are qualified to degree level within the domain of engineering science and technology;
- are competent in the relevant domain-specific discipline(s) at the level of BSc:
  - Technology and Realisation
  - User and Society
  - Creativity and Aesthetics
  - Business and Entrepreneurship
  - Math, Data and Computing
  - Design and Research Processes
- are able to conduct research and design under supervision;
- are aware of the significance of other disciplines;
- take a scientific approach to non-complex problems and ideas, based on current knowledge;
- possess intellectual skills that enable them to reflect critically, reason and form opinions under supervision, are good at communicating the results of their learning, thinking, acts and decision-making processes;
- can plan and implement their activities;
- are aware of the temporal and societal contexts of science and technology (comprehension/analysis);
- in addition to a recognisable domain-specific profile, possess a sufficiently broad basis to be able to work or collaborate in an interdisciplinary and multi-disciplinary context. Multidisciplinary means focusing on other relevant disciplines needed to solve the design or research problem in question.

Master of Science graduates of the degree programme Industrial Design:
- are qualified to degree level within the domain of 'science engineering & technology';
- are competent in the relevant domain-specific discipline(s) at the level of MSc:
  - Technology and Realisation
  - User and Society
  - Creativity and Aesthetics
  - Business and Entrepreneurship
  - Math, Data and Computing
  - Design and Research Processes
- are able to conduct research and design independently;
- have the ability and attitude to include other disciplines in their research, where necessary;
- have a scientific approach to complex problems and ideas;
- possess intellectual skills that enable them to reflect critically, reason and form opinions
- have the ability to communicate the results of their learning, thinking, acts and decision-making processes at an international level;
- are aware of the temporal and social context of science and technology (comprehension/analysis) and can integrate this context in their scientific work;
- in addition to a recognisable domain-specific profile, possess a sufficiently broad basis to be able to work or collaborate in an interdisciplinary and multi-disciplinary context. Multidisciplinary means being focused on other relevant disciplines needed to solve the design or research problem in question;
- have the ability and attitude to seek new potential applications, taking the social context into consideration.

Attachment 4. Overview of the programme

BSc Industrial Design

Year 1 – 60 ECTS
- From Idea to Design
- Creative programming
- Calculus
- User-centred design
- Applied physics
- Elective course 1
- Project 1 design
- Creative Electronics
- Data analytics for engineers
- USE basics
- Elective course 2

Year 2 – 60 ECTS
- Project 2 design
- USE course
- Elective course 3
- Engineering design
- Design <> research
- USE course
- Project 3 design research
- Aesthetics of interaction
- USE course
- Elective course 4
- Making sense of sensors
- USE course
- Elective course 5

Year 3 – 60 ECTS
- External learning activity
- Professional identity and vision
- Final bachelor project
- Design innovation methods
- Elective course 6

MSc Industrial Design

Year 1 – 60 ECTS
- Project 1 design
- Constructive design research
- Elective course 1
- Project 2 design research
- Track course
- Elective course

Year 2 – 60 ECTS
- International experience (project/exchange)
- Final master project proposal
- Exemption elective course
- Final master project

Attachment 5. Documents

Information Report
Designers for the future. Educational Self-Evaluation Industrial Design 2018, Eindhoven University of Technology 2019. This report includes a chapter *Students' Opinion about bachelor and master programme*.

Materials made available electronically and/or on site
Appendices to the information report
- Domain Specific Reference Document
- Assessment Rubrics Booklet
- Bachelor Curriculum Overview
- Bachelor Electives Overview
- Master Curriculum Overview
- Master Electives Overview
- Descriptions BSc / MSc courses
- Self-directed learning
- BSc Teacher Coach Guide 2018-2019
- BSc Tutor Guide
- MSc Project Coach & Graduation Mentor Guide
- BSc Programme & Examination Regulations 2018-2019
- MSc Programme & Examination Regulations 2018-2019
- Departmental Selection Procedure ID
- Student Research Publications
- Diversity Students & Staff Ratio
- Staff Overview
- Collaborations University - Companies
- Examination Regulation EC-ID 2018-2019
- National Student Enquiry 2014-18 Bachelor ID
- National Student Enquiry 2014-18 Master ID
- Quality Assurance policy

Course descriptions:
- User centred design
- Aesthetics of interaction
- Digital craftsmanship
- Designerly perspective on IoT
- Researching the future everyday
- Design for behavioural change

Study Guide 2018-2019, Department of Industrial Design
Assessment Policy Industrial Design, 2016-2017
Note on Specialisation 'statutory teacher-training minor" (BSc Industrial Design)
Board of Examiners - Minutes and Annual Reports
Educational Programme Committee – Minutes and Annual Reports

Final Bachelor Projects

20 bachelor projects, portfolios and their evaluations from students who graduated in 2016-2017 and 2017-2018.

Final Master Projects

15 master projects, portfolios and their evaluations from students who graduated in 2016-2017 and 2017-2018.