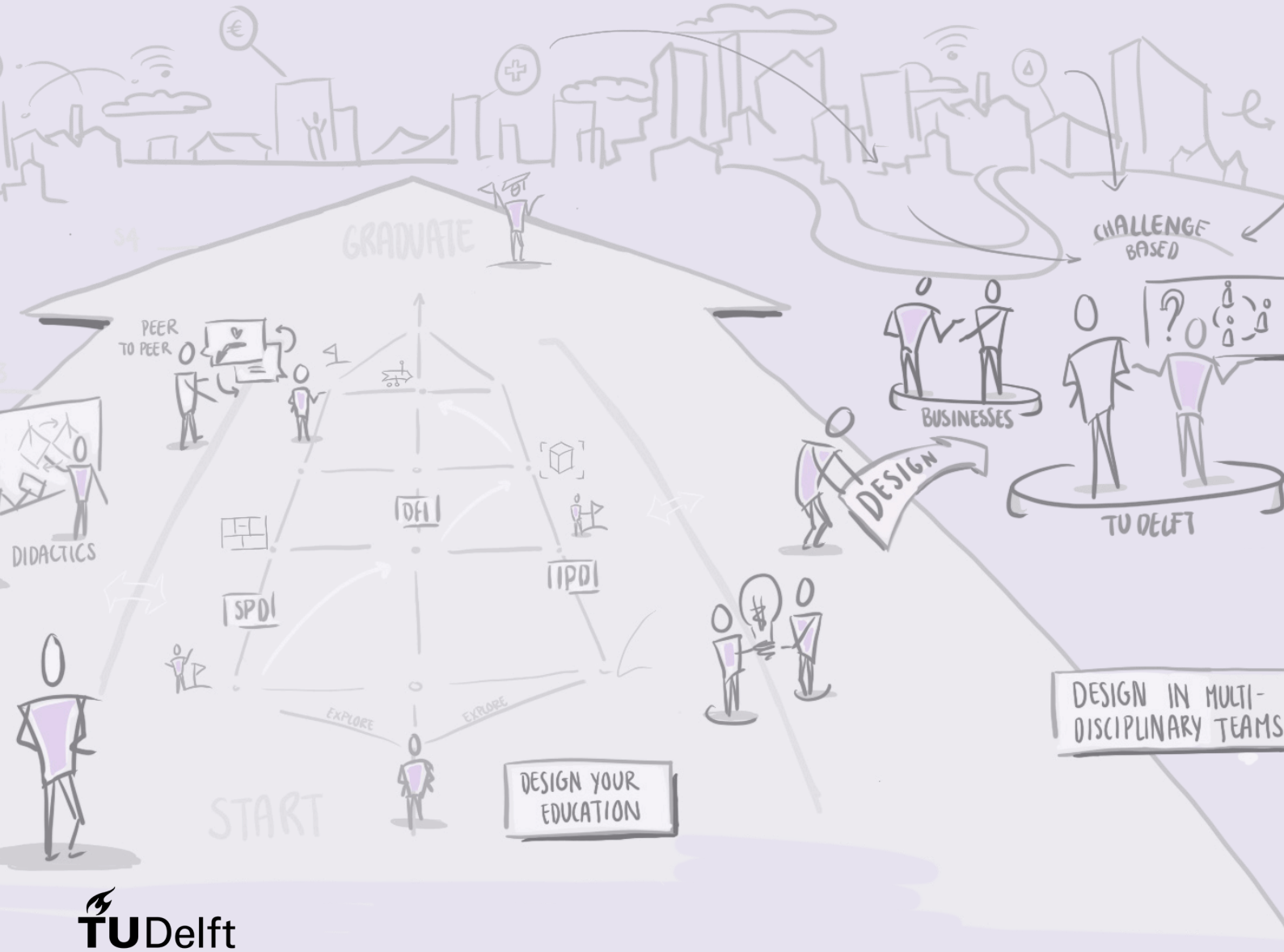
EXPLORING THE FUTURE OF THE EDUCATION OF THE DESIGNER

Envisioning a Master experience for MSc. students at the faculty of Industrial Design Engineering

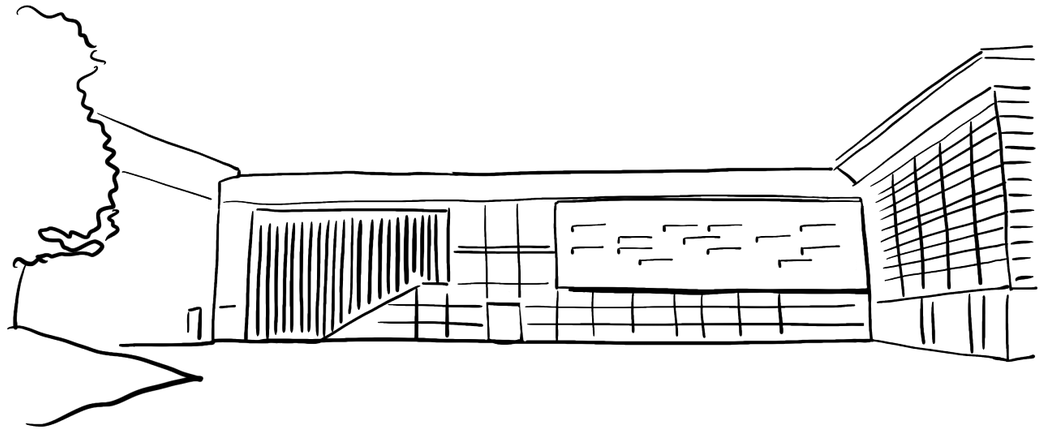


TU Delft

Master thesis 2021
Bente Willinge Gratama
Strategic Product Design

“Thanks to our powers of imagination and our strength in depicting new ideas, Industrial Designers are able to make the future more transparent for others, and help the world move forward. "

Ena Voûte, Dean of IDE



Graduation MSc. Thesis Strategic Product Design
Faculty Industrial Design Engineering
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Preface

Dear reader,

This Master thesis is the final deliverable of my graduation project in collaboration with my own faculty Industrial Design Engineering at the TU Delft. Besides the fact that multiple design skills have come together in this project, I was able to combine two of big interests of mine: strategic design & design education.

This project was initiated by the observation of the changing role of the designer outside the walls of the faculty. The education of the designer can be seen as the foundation of the lifelong development of the professional designer after graduation at IDE. During my Bachelor and my Master, I became a student assistant in the design courses PO1 and PO2 of the Bachelor, where I developed my love for design methodologies and ambitions in teaching design. Our educated designerly way of thinking becomes increasingly important for solving future, complex problems, but as students we have to be prepared for a world that is changing faster than ever. My enthusiasm for contributing to the education of the designer and own believe in the subject has been a big support in going throughout my own graduation.

During this project, I wanted to be challenged by the ability of mixing different design approaches and methods. The use of the ViP method made sure I was challenged in my ways of design thinking. Furthermore, I wanted to manage my own project that includes planning interviews, creative sessions and deadlines. But most important was a healthy and inspiring learning journey as a designer.

A big challenge of this project was to be a designer, a design student, a graduate and a design teaching assistant at the same time, and to not put my own opinions and ambitions too much to the front. I would like to thank Giulia and Sylvia as my combination of supervisors, you were the perfect combination to me and gave me this opportunity. Thank you for challenging me, supporting me during this journey of ups and downs while graduating at home, giving me confidence and sharing the ambition for teaching design together. Above all, I really appreciated the guidance from my team during the project, although we were not able to meet in person

Also, I want to thank Matthijs van Dijk for guiding me in the process of ViP and supporting me to embrace both opportunities and vagueness of the method. The approach changed my perspective on multiple things in design thinking, and a different mindset. With ViP, I was able to fully deep dive in the subject. Frido, thank you for the critical and inspiring conversations during my process.

Lastly, I would like to thank my IDE friends and educators that provided me with their insights and the inspiration during brainstorm sessions and conversations, especially my two Charlottes, who gave me the feeling that I was not alone in this graduation journey. I would like to thank my roommates for motivating me and listening to me while graduating from home and complementing me for my ambitions and enthusiasm. I would like to thank my friends and my family for their support and making me believe in my own power as designer and student.

Enjoy your reading!

Bente Willinge Gratama

Excecutive Summary

This project is executed with and for the Faculty of Industrial Design Engineering (IDE) of the TU Delft. Over the last half-century, IDE's education for designers has diversified and evolved considerably, in part of art academies and technical education (Voûte et al., 2020). Societal changes, the maturing of design as an academic discipline between science and engineering and international developments of the educational system, have stimulated this growth. Now the faculty is innovating its education again. After innovating the Bachelor, the faculty is starting to look at opportunities to innovate the Master program.

The initial assignment of this thesis originated from two observations: the broadening role of the designer and the changing learning behavior of students. For design, the design activities have changed from designing physical products to designing digital experiences and from designing services to creating parts of larger, complex systems. The use of designers has manifested in different ways. When it comes to education, the globalization and internationalization of the economy along with the rapid development of information and communication technologies, continuously changes the ways we live, work, and learn (Voogt & Roblin, 2012): learners of the future will be learning by different experiences and approaches than universities are used to (Kamp, 2020). The initial assignment includes the investigation of learning experiences that respond to the combination of the two, to investigate opportunities for IDE: design and education. However, innovating in the educational sector is something that is time consuming, with many people involved. And while investigating these new opportunities, the world outside the walls of the faculty is changing constantly by changing much quicker than we think.

The Double Diamond model of the British Design Counsel (2015) is used in combination with the design steps of the ViP Approach of Hekkert and van Dijk (2011) as the approach of this project. First, an explorative field research is conducted to deconstruct the current situation. Based on the research of the context, it appeared that IDE, despite their high-quality education, can already see challenge in keeping its relevancy as well its position as a leader in the education for designers. This is influenced by their limited role in multidisciplinary projects, how to respond to the digital world and the broadening role of the design profession in the working field. Hence, the research question for this thesis is formulated following: **What learning experiences are seen as most valuable when entering the world outside IDE and contribute to the preparation of the MSc. student?**

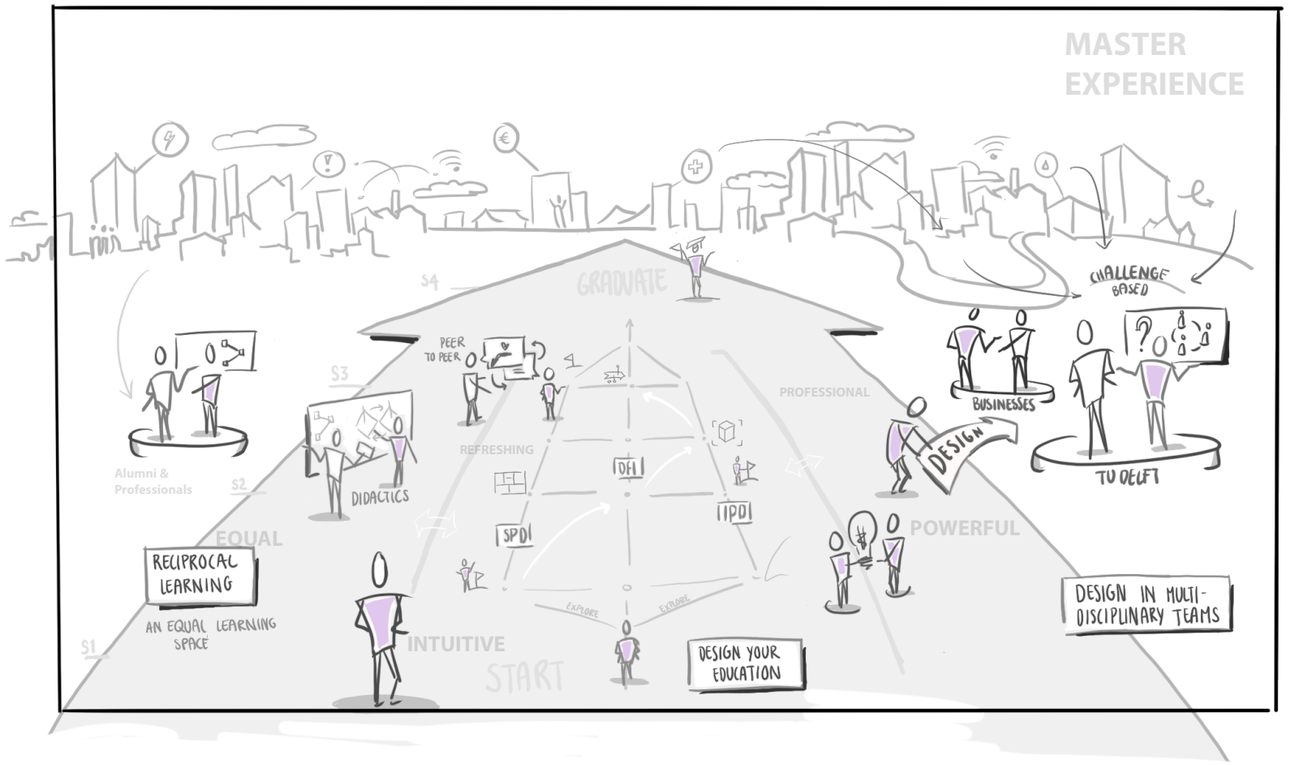
After the deconstruction of the current context, the future context of both fields of design and education is investigated with the aid of the ViP approach where "opportunities of the future" are investigated. This resulted into a two-dimensional framework that combines many trends, developments and principles categorized in 'driving forces of the future'. The framework guided as the future view of the education of the designer that was evaluated with the core competencies of design and conversations with the supervisory team, experts and students. This resulted into nine possible future behaviors of students to respond to as IDE. To conclude the first diamond of this thesis, the evaluation of the future lead to a design focus of the most valuable opportunities offered by the framework. Three areas were selected.

Following by the formulation of the design focus of this thesis that consisted of three different design visions resulting in three different design directions including a statement, interaction vision and experience qualities. Within the interaction visions, the relationship between an IDE student and its education were designed.

Through brainstorming sessions and selection rounds, three learning experience concepts were developed and combined into a whole new Master experience of IDE that transforms the traditional structure. The designed Master learning experience aims to combine different insights of the future, insights from students and other parties. It aims to contribute as an envisioned future of the education of the designer.

In short, the new Master experience includes learning experiences that **focus on the individual in the whole (1), creating reciprocal learning relations (2) and aims to increase the value of designers in multidisciplinary teams (3).**

As this learning experience is designed from an envisioned future, supported by extensive stakeholder research and the student's needs, it would contribute to Master innovation by offering these learning experiences that are perceived as valuable in the transformation from design student to a design professional. Also, a first validation round is held over the whole Master experience including the learning experience concepts, where the experiences were critically but positively validated.



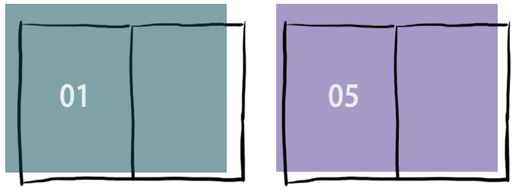
Lastly, additions to the current Manifesto are made. The developed final experience next to additional learnings in this thesis derived from exploring the future, made that focusing on preparing design students to work with other disciplines equally and going beyond the traditional design discipline of IDE, should be main concerns of the faculty. The design process of this thesis puts light on designing the initial interaction between students and IDE, that resulted in more recommendations. This included a focus on the wellbeing of the design student next to the future role of educators as things to take highly into account when innovating in the design education of IDE.

Innovating in the educational sector includes many opinions and different perspectives. Also, in design, design practitioners consisting of students, educators, professionals, Alumni and other design related professions have visions on the education of the designer based on their own experiences. This thesis aims to combine, explore and visualize the insights, needs and of both fields in combination with room for design and creativity.

Reading Guide

A few basic design principles are used within this Master thesis to guide the reader through the whole report.

1st Diamond **2nd Diamond**



Before the start of each chapter, a short introduction will be given and the content will be described. Each chapter has its own supportive color, according to the colors given to the phases in the Double Diamond process (British Counsel, 2015)

01 05

Each left page on the spread has the number of the Chapter supported by the color of the first or second Diamond.

Subtitles

Paragraph titles are light colored, green or purple, supported by the color of the Double Diamond process.

Subsection #1

All section titles are light grey in order to structure the paragraphs, numbers of the Chapter are involved.

Subsection #2

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The body text contains of bolded subsection titles, light text and bolded conclusions or definitions. The bolded text aims to create an easier readability of the report and indicates main steps or conclusions in the story.

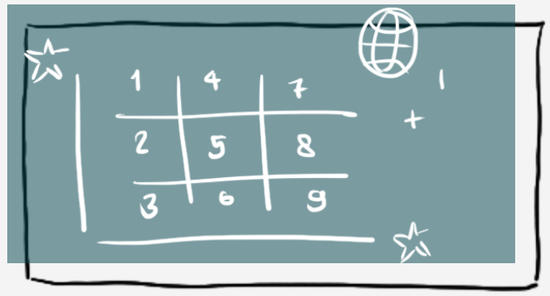
Key decisions or conclusions (1st)

Key decisions or conclusions (2nd)

To summarize sections, underline design decisions, colored boxed are used.

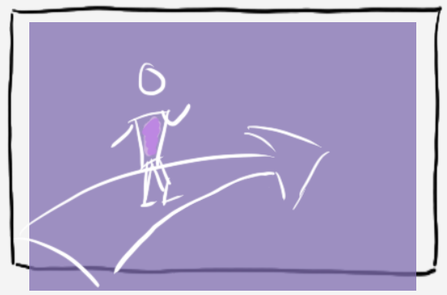
MAIN DELIVERABLES

1

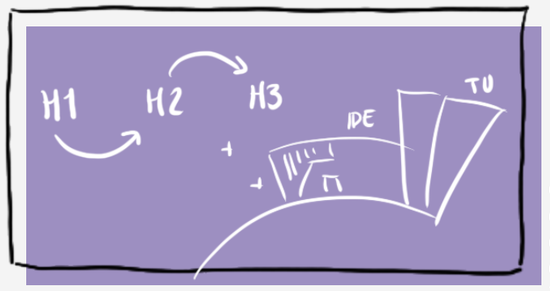


Chapter 03
3.2 | Driving Forces
3.3 | The Future context

2



Chapter 05
MSc. Experience | 5.2



3

Chapter 06 & 07
6.1 | Future positioning
6.2 | Points for development
6.3 | Roadmap
7.2 | Final Recommendations

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01

Introducing the Project

This chapter gives an introduction to this thesis that includes the initial assignment and project approach.

01

1.1 Initial assignment

Within the changing dynamics in society next to its increasing complexity, a big change in the role of the designer is observed by many researchers, various industries and design students (Voûte et al., 2020). This change is observed in the use of design: From designing physical products to designing digital experiences and from designing services to creating parts of larger, complex systems (Stappers, 2020). New technologies arise, like Big Data and Artificial Intelligence, that bring future opportunities, but also new ethical concerns when designing new experiences, services or products. The designerly way of working of designers has manifested in different areas of e.g. business models, human-centered approaches, collaborations and prototyping (Calabretta & Kleinsmann, 2017).

This project is executed with and for the Faculty of Industrial Design Engineering (IDE) of the TU Delft. Over the last half-century, IDE's education for designers has diversified and evolved considerably, in part of art academies and technical education (Voûte et al., 2020), which makes the design education of IDE. Societal changes, the maturing of design as an academic discipline between science and engineering and international developments of the educational system, have stimulated this successful growth (Voûte et al., 2020). The faculty of IDE is aware of the changing role of the designer and as an educational organization the faculty faces various challenges. Due to the globalization and internationalization of the economy along with the rapid development of information and communication technologies, the dynamics in people's life are continuously changing in the ways we live, work, and learn (Voogt & Roblin, 2012): learners of the future will be learning by different methods than universities are used to (Kamp, 2020). Trends and disruptive developments like the changing role of the government, the impact of the digital society, the growing demand for higher education globally and the continuous growth of students (TU Delft, 2018) have a major impact on both how education is delivered to students as well as the positioning of universities in the coming years. These trends offer opportunities, but also cause challenges including both students and educators. It becomes a difficult task for universities to keep up with the demands and high pace of the future world.

Moreover, the global pandemic of COVID-19 has shown that educational organizations can adapt and accelerate digitally and has created more attention to the well-being of humankind (Stielkowski, 2020). However, when digitizing education, clear communication and collaboration are key for successful online, at home, education. Educators question themselves on how to still be able to create meaningful learning experiences for their students and how to stay relevant as a university in this digital era.

Future vision on Design

The faculty aims to keep its quality and relevancy in the field of design education in the future as well as for design students as it is becoming more uncertain what their job will look like after graduation (Voûte et al.,2020). In order to respond to the fast-changing world, the faculty is initiating certain activities to innovate the learning experience of today for their design students. Together with experts and educators of IDE a future vision on the future of design is developed, see Figure 1, based on their three pillars: People, Organization & Technology.

In terms of people affected, the designer's view is widening from the single user to include context and societal issues. For technology, there is a shift from single mass-produced products to product-service systems with many parts and stakeholders. For the field of organization, there is a shift from the single manufacturer to service constellations, and on to highly connected, multi-actor and multi-stakeholder processes (Voûte et al., 2020). This vision was used for the renewal of the Bachelor starting in September 2021.
Innovating in the educational sector is something that is time consuming, with many people involved. And while investigating new opportunities, the world outside the walls of the faculty is changing constantly by adapting much quicker to the digital transformations (Kamp, 2020) than universities.

Formulation of the initial assignment

The combination of the changing dynamics in both design, its education and learning behaviors among students in general, results in the initial research goal of this thesis. As the Bachelor is already in its renewal, looking at ways to innovate in the Master programs is seen as most valuable for IDE and can contribute to the current innovation proces that already started. Where the Bachelor helps design students to build their foundation as an Industrial Designer, the Master offers opportunities to find focus and exploration in the field of design. Mutliple learning experiences designed by educators of the faculty support the development of the design education of their students. These learning experiences are in the form of courses, activities and events that take place in individual and both collaborative settings. By building up on each experience, students undergo the learning curve of the programs, that eventually aims to deliver responsible and pro-active graduates.

This thesis aims to contribute to the current innovation process by the development of new learning experiences over the time span of the Master curriculum. By investigating the current context of IDE, followed by a future exploration, opportunities can be identified for new design interventions that are student-centered. This means that both changes of the future, underlying needs of the students are considered in order to create design interventions that fit the design student that supports them in the journey towards a design graduate and professional. To summarize, the following initial assignment is formulated as following:

The development of learning experiences for MSc. IDE students that fit with the future of design education and can give inspiring and relevant insights to the current innovation proces of the Master

INITIAL ASSIGNMENT

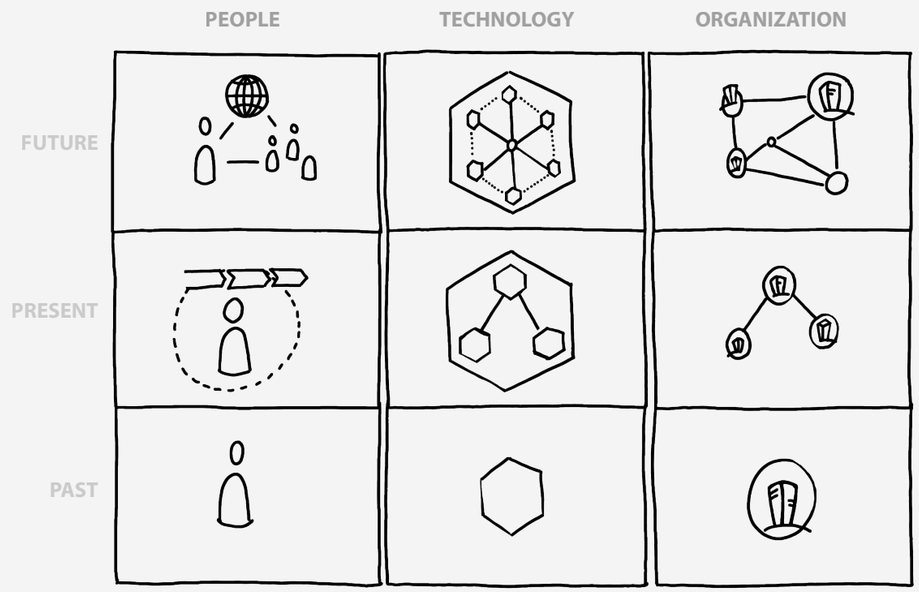


Figure 1 - Future vision on design by IDE (Voûte et al.,2020

People involved

In this project, multiple groups of people are involved, see Figure 2. A division can be made between the people within the educational area of IDE and the people outside IDE. Each group of people has its own role in the project that will be further investigated in Chapter 02. Within the area of IDE, educators and students are also approached for brainstorm sessions and validation sessions.

As this project is conducted with the faculty of IDE as a client, the supervisory team plays also an important role as the project initiators. The project supervisors are Giulia Calabretta and Sylvia Mooij. Giulia is the coordinator of the Strategic Product Design Master and Sylvia is the coordinator of the IDE Bachelor, both are highly involved in the innovation of the education at IDE.

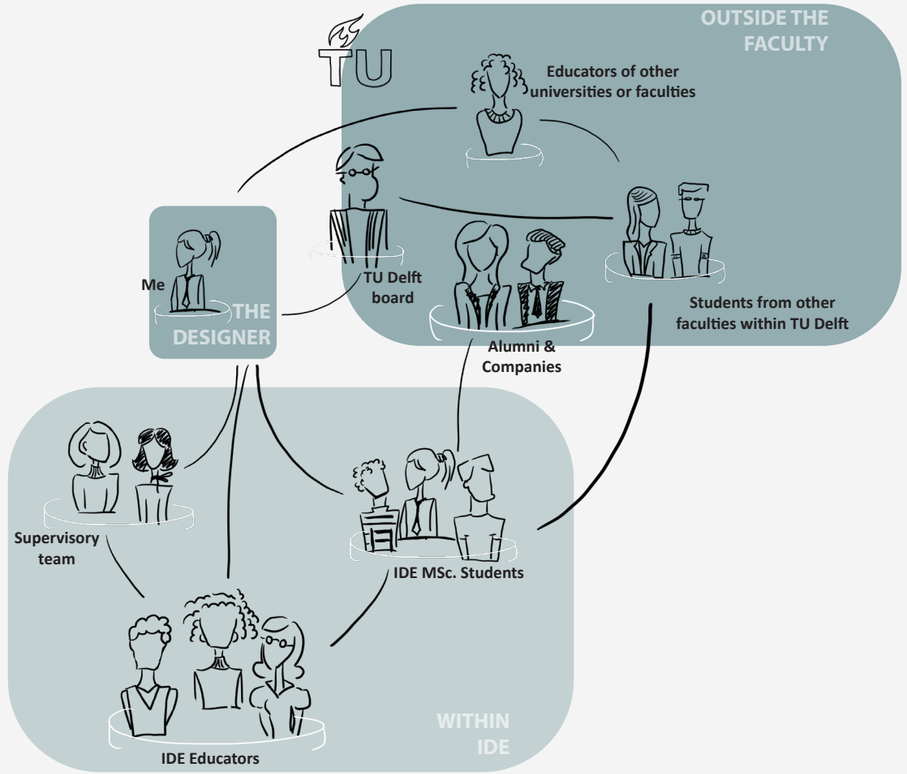


Figure 2 - Overview of people involved (own visual)

1.2 Project approach

This paragraph gives an explanation of the approach and structure used in this project, that is visualized in Figure 5 on the next page. The report is structured according to the Double Diamond Model (British Design Counsel, 2019) in order to communicate the overall process clearly. The Double Diamond offers a design approach of diverging and converging, consisting of four stages, see Figure 3. This will help to explore and focus in the design process. Based on solutionspace offered by the formulation of the initial assignment, the Vision in Product (ViP) approach is used. First, the ViP approach is explained briefly followed by the report structure that formulates the combined approach.

Due to the COVID-19 crisis the majority of the project is done remotely and online. A few real-life experiences were possible with IDE students. Conversations and interviews with educators, experts in the field of design and businesses were held online through Zoom, Miro and Microsoft Teams. During all phases, this situation has been taken into account.

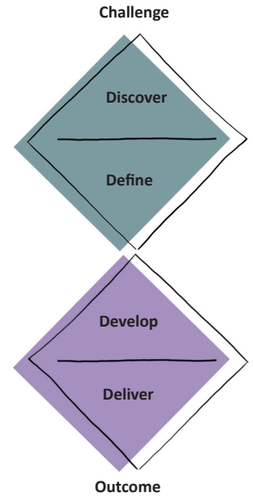


Figure 3 - Double Diamond Model & Principles (British Counsel, 2019)

DESIGN PRINCIPLES

Put people first

Communicate visually & inclusively

Collaborate & Co-create

Iterate, Iterate, Iterate

Vision in Product (ViP)

The ViP approach is a context-driven and user-centered design approach, that is "exploring what is possible tomorrow instead of solving the problems of today" (Hekkert & van Dijk, 2011). **During this project, the steps of the ViP approach are used as a way to explore the future context and develop interaction visions between the IDE student and its education**. ViP is interaction-driven, where future interactions between a user and product or service are defined that support the ideation phase. According to Hekkert and van Dijk (2011), a product or service are means to accomplish an appropriate interaction (relationship) in a certain context. The approach supports the ambition in this thesis to develop student-centered experiences in the first place.

Figure 4 visualizes the original ViP model, where a division is made between several levels of description: context level, interaction level and product level. All levels have their own steps and goals that are used in this project. The main challenge during this project is to structure research outcomes and translate these into design directions. The ViP approach allows the design process to escape from the 'problem-solution' framework and come up with inspiring ideas for the future context of learning behaviors among design students.

The approach of ViP helps to build a future context where future behaviors originate and latent, future or already present needs are unfolded. The most important design step of the approach is the development of the desired interaction between a design student and its education.

In this project, the future context of both education and design will be investigated in order to embrace the complexity of both fields. During the process of research and design, the designer will experience a deep dive in the determined future context and behavior of the user. The product to be developed will be in the form of a learning experience that acts as a recommendation for innovating the design education at IDE designed from the interactions designed with the steps of ViP. Before entering the "designing the future" phase, the current context is deconstructed through various research methods.

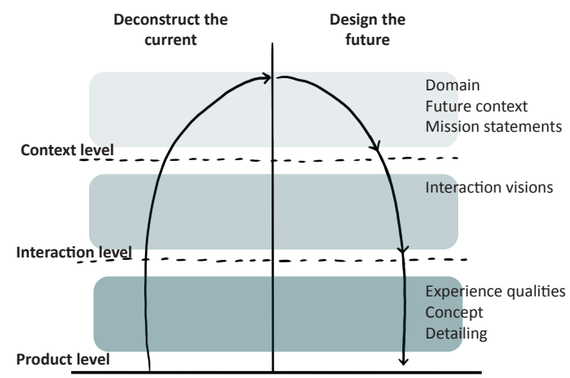
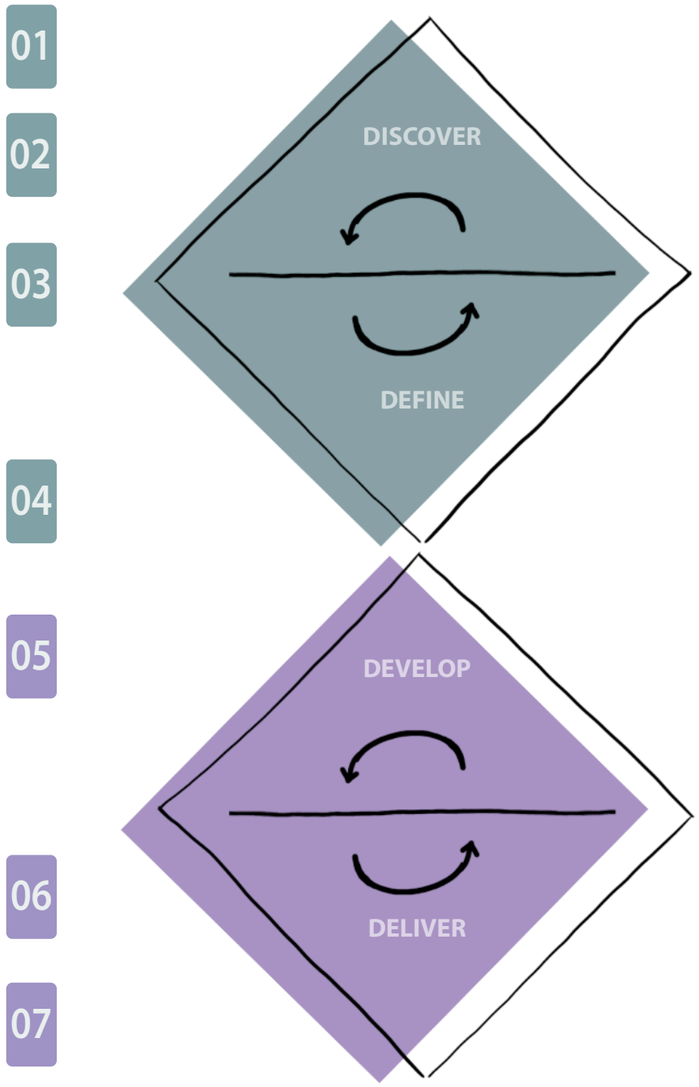


Figure 4 - ViP model by Hekkert en van Dijk (2011)



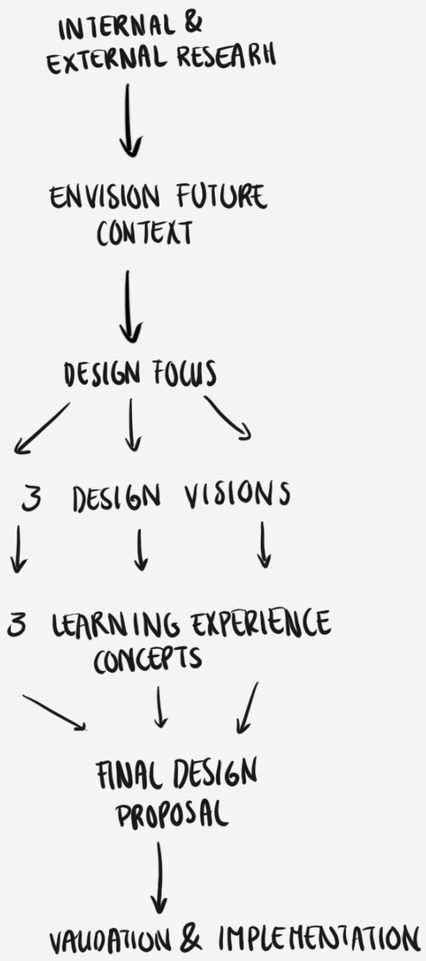


Figure 5 - Project approach, structure & activities (own visual)

1.2.1
Combined Approach & report structure

This section describes the combined approach and project structure of the Double Diamond Model and the steps of the ViP approach. During each phase, iterative processes have taken place that resulted into continous loops of researching through design, visualized in Figure 5. During each stage, research is conducted to support and validate findings.

DISCOVER

The first part of this project focuses on exploring and understanding both current situation and future situations at IDE. The proposed research activities are based on a mix of different design methods to enhance the complexity of the assignment. As many people, with different opinions are involved in this assignment, the initial part of exploring and investigating the current situation of IDE aims at gaining a deep understanding of current activities of the faculty and learning experiences of its design education. It has to be noted that the attitude of the designer in this phase is open for unexpected insights and is able to be in an observable role. Informal qualitative interviews among stakeholders followed by an empathizing session with IDE Msc. students, supports the investigating the current situation of IDE. The exploration concludes with main insights that result in the formulation of the research question.

Still in the disovery phase, the steps of the ViP method start. After the definition of the domain, the collection of factors follows. Factors consist of trends, developments, principles and states in the given context, gaining through an extensive literature research supported by the initial research. Following the steps of categorizing factors into clusters and finding underlying relation between them result the design of a two-dimensional framework that distills the complexity of the future of the domain.

DEFINE

Outcomes from the discover phase result in possible design directions that form the design focus of this project. **The design focus is the bridge between the first and second diamond.** First, by evaluating the framework with the supervisory team and the core competencies of design, a decision can be made for possible design directions. Based on the description of each practice, mission statements are formulated as a way of how the designer, in this case IDE, can respond to the described situation. The design vision of a practice includes a mission statement, interaction vision and qualities the future design has to meet.

DEVELOP

During the develop phase, the mission statements of the chosen practices are further analyzed to investigate what kind of relationship is would be designed. Brainstorm sessions with other students were held to think of out-of-the box ideas. **During this phase, concepts for learning experiences are developed.**

Interviews with students and experts supported the iteration and validation of the final concepts. In the end, concepts were combined over a time span of a whole Master curriculum as a final design. The final design was presented as a proposal and source of inspiration for the innovation of the IDE MSc. program of IDE.

DELIVER

Near the end, the final design is validated with experts and students. Furthermore, **an implementation plan is made where the difficulties of innovating in an educational sector are recognized and reflected.**

To conclude the project, last validations and findings supported the formulation of important recommendations for IDE. This includes a future positioning for IDE and additional learnings for the faculty. The delivery phase ends with a final conclusion and personal reflection.

02

Understanding the context of IDE

This chapter describes the results of the research conducted within and outside IDE of the current situation. The chapter ends with a conclusion and final research question for this thesis.

02 2.1 Internal research

In the first months of the project, informal interviews among stakeholders were conducted that consisted of 28 interviews with people internally and externally. All interview guides can be found in Appendix B, all participants are held anonymous. The qualitative research approach are supported by desk research about the faculty and literature.

This paragraph describes the outcomes of the internal research within IDE. This consists of the results from desk research about the faculty, its positioning and interviews with IDE Educators and IDE students. Moreover, to understand the current learning experience of an IDE student, an empathizing session is held. The set-up for the internal research is visualized in Figure 6.

Desk research was conducted to understand the current acitvities and organization of the faculty next to a competition analysis in the field design education. The internal interviews with educators and students were conducted followed by an empathizing session with IDE MSc. students that resulted in a learning journey map that identified current challenges in the learning experience of the design student.

After the internal research, external research was conducted to eventually conclude the exploration phase with the formulation of the final research question of this thesis.

Figure 6 - Internal research set-up

2.1.1 About the faculty

With over 2,000 students and a strong research team of 350 professionals, the faculty of Industrial Design Engineering (IDE) is seen as one of the world's leading design schools (IDE, 2020) that is part of the Technical University of Delft (TU Delft).

Role within the TU Delft

The TU Delft is the oldest and largest technical university in the Netherlands (TU Delft, 2020) has eight faculties that offer sixteen Bachelor programs and more than 30 Master programs including 25,000 students and 6,000 employees. Supported by the TU Delft, every student has the opportunity to participate in multi-disciplinary projects outside the curriculum, like Hyperloop, MARCH or student Non-governmental organizations, aiming to bundle the powers of technical students. These projects are of high intensity and often have a duration of a whole academic year. The TU Delft itself is part of the 4TU, a partnership of the four technical universities in the Netherlands: TU Eindhoven, TU Twente, TU Delft and University of Wageningen. The aim of the four universities is "to further strengthen their position, both nationally and internationally, and thereby strengthen the position of the Dutch knowledge economy." (4TU, 2020). Moreover, more opportunities are available, but will not be further discussed in this thesis and can be found by the university itself.

The TU Delft has risen steadily in international rankings and is now one of the top 20 universities in Europe. **Currently, the TU Delft is aware of the challenges of the increasing number of students and digital transformations. Especially with the reactions on the lockdown during COVID-19, the well-being of students has become a more significant responsibility when thinking of digitizing education.**

IDE Bachelor renewal

The renewal of the three-year Bachelor program will be introduced by the start of the new education year in September 2021. The current Bachelor program will undergo quite a transformation comparing to its current situation. The future vision mentioned in the initial assignment, formed the basis for the transformation. The Bachelor is more focused on the digital world and today's relevant design skills and competencies (Voûte et al., 2020) and will strengthen the positioning of the faculty in the positioning as a design education with a technical background on the longer-term.

Next to the Bachelor, the design faculty offers three main Master (MSc.) programs: Strategic Product Design (SPD), Design for Interaction (DfI) and Integrated Product Design (IPD). **As stated in the initial assignment, when the Bachelor is already starting its renewal, this thesis aims to contribute to the innovation of the Master.**

Positioning in the field of design education

In the last years, the faculty IDE set up a broad network of partner universities all over the world (IDE, 2020) and hosts currently a variety of design courses and established exchange programs with 70 design schools worldwide (IDE,2020). However, this network also forms the competitive environment of the faculty. In Appendix A, a list of competitive Master programs can be found that is based on previous research done by IDE (van Eijk, 2020). Based on the activities conducted by other design schools, important insights can be drawn that influence of the positioning of the current Master IDE progams near the future.

Firstly, there is **an increasing number of Master programs that offer more self-directed programs**, with less compulsory courses. Students have the opportunity to create their own curriculum that results in an increasing power of the learning student. Digital transformations make this easier to implement by offering blended learning courses, where students become more flexible in planning their study time. At IDE, electives spaces are available for students to explore areas of interest. Also, the graduation phase of the Master is fully the own responsibility of the student. However, the competitive programs even offer the flexibility over a whole curriculum that supports the development of responsible, life-long learning students. Master programs, like the Industrial Design Master at the TU Eindhoven and TU Twente, offer their students self-directed learning where students have the ability to choose their own Master journey over 80% (TUe,2020). However, more guidance can also be seen as a strength of IDE.

Secondly, other **Design programs are using online communities to integrate multidisciplinary collaborations** in projects that integrate different professions. Design faculties are looking for ways to blend different study backgrounds with the support of the digitalization and aim to make design education broader by collaborating with non-design people (Aalto Helsinki, 2020; Politecnico di Milano, 2020; Cargeni Mellon, 2020).

These Masters consists of over 50% challenge-based learning methods, where there is little guidance of a specific problem statement (Baeten, 2013) or an educator. This is done to let design students collaborate with other disciplines and communicate design to others. At IDE, all three Master programs share the same elective space and some compulsory courses during the first year. Electives like Build Your Startup and JMP (Joint Master Project) are supporting collaborations between students of different Masters and even faculties. Courses like JIP (Joint Interdisciplinary Projects) aim for collaborations between different faculties and disciplines within the TU Delft, however the role of IDE in these projects is limited.

Thirdly, **new intrants in this area are non-academic organizations that start to develop education programs about design thinking** for their employees as well external people and clients (Koos Service Design, 2020; LiveWork, 2020; McKinsey, 2020). These learning experiences are in forms of online seminars and workshops in a short period of time, in order to update their design skills or learn new ones fast. In this way, design students can easily learn other skills outside their curriculum. However, for people who are new to design methods, it makes it easier to learn something about design thinking quickly but may not deliver the unique designerly way of thinking that is developed at university.

To conclude, the combination of the technical background in combination with design thinking approaches, makes the design education of IDE of high quality. However, IDE can see a challenge in keeping its positioning as a leader in design education when looking at the field of competitive educational programs for design students. To respond to the changes in the field of design education, it is time to look at the opportunities of self-directed learning, more multidisciplinary projects and challenge-based learning methods in order to keep positioning of IDE as well as a high-quality education for next generations of students that fit the dynamics of the future.

KEY INSIGHTS
COMPETITION

SELF- DIRECTED EXPERIENCES

CHALLENGE-BASED, MULTIDISCIPLINARY

SHORTER, ONLINE DESIGN COURSES

2.1.2
IDE Educators

During a student's education the educator guides its students in the transition from A to B where they support their learning and acquisition of knowledge and skills by using knowledge as a means. In the organization at IDE, there are part-time and full-time teachers, professors that are divided over multiple fields, university teachers, design coaches and PhD candidates (IDE, 2020). At IDE, educators that are involved in research, are devided over three research departments including several Design Labs. In this section, the role of educators is investigated next to how design courses and experiences are currently designed by educators. Moreover, the interviews (n=5) gave insights in several views of the future of design educaation. All insights of the interviews with IDE educators can be found in Appendix C.

As the designers of design education

At IDE, physical environments are used to support collaboration between a students and educator next to reflection to stimulate the learning of students, like the design studios and the IDE arena. A key quality of design teaching in the studio is the nature of the interaction between educator and students (Daalhuizen & Schoormans, 2018). **Learning 'design thinking' at IDE is done by the use of methods of experiential learning to get students acquainted with the use of several design approaches and methods.** Experiential learning is often formulated by 'learning by doing' (IDE, 2020), where students learn through experiences by reflecting on them, or better said: "learning through reflection on doing" (Kolb, 1984).

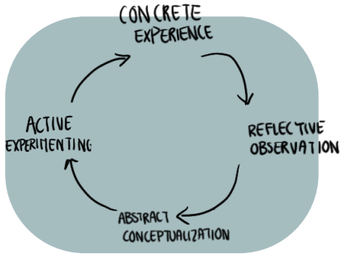


Figure 7 - Learning cycle of Kolb (1984)

Experiential learning is visualized through the Experiential Learning Model (ELM) of David Kolb (1984), see Figure 7 for the stages a student goes through 'when learning'. Educators often let students experience the situation by presenting the client and initial assignment, followed by a reflection of students themselves resulting in thinking of solutions that ends with an experimentation step. The model is often used by IDE educators in combination with the design process for developing didactics as the underlying structure of IDE's course activities (Smulders et al., 2020). Experimentation has become widespread among the innovation of businesses (Bocken, 2020) and is used in many other approaches like the Lean Startup (Ries, 2011): Build, Measure, Learn.

Experiential learning can be divided in multiple methods of learning, that are based on what kind of challenge and means available, see Figure 8 that is developed by one of the educators of IDE. According to the interviewed educators, problem-based learning and case-based learning are currently used during courses and are often used in teamwork projects where a part of the challenge is already formulated and design methods are proposed. Both learning ways ask students to tackle real-life problems in small groups by using given design methods. The difference between problem-based and case-based learning lies internally in the intensity of guidance of educators where within problem-based learning, students have more freedom in both problem and solution space.

Challenge-based learning

According to multiple educators, the future lies within challenge-based learning as the challenges designers will face getting more complex (Voûte et al., 2020; Smulders et al.,2019), which evolves from the two methods before. Challenge-based learning is seen as a step next towards the challenges and learning of the future (Malmqvist et al.,2015), that will better support students in their preparation for the roles they get, as it is multidisciplinary, challenges are complex, and the problem is not defined. This will be interesting for developing new courses, but the insecurity of students should be prevented. The course "Build Your Startup" is already a good example of a challenge-based course. Moreover, collaborative initiatives like the Joint Interdisciplinary Project (JIP) course at the TU Delft, also fit the characteristics of Challenge-based learning. With the need for other, maybe more digital experiences, courses have to be designed differently that will also eventually cause a changing role of the designer that already has been experienced (van Eijk, 2019) where educators transform from a knowledge generator into a coach of the learning process of students.

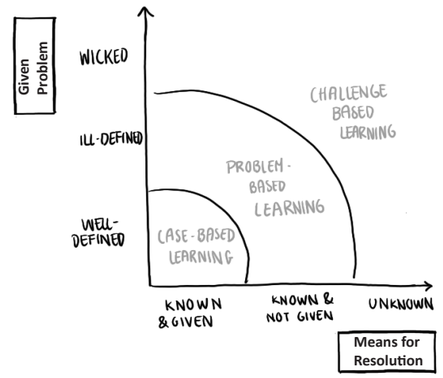


Figure 8 - Sketch of areas of experiential learning by Smulders (2018)

02

2.1.3
IDE Student

The student is seen as the most important stakeholder in the development of new ideas for the design education at IDE. This paragraph describes the results from the interviews with students and the empathizing sessions with the IDE student to dive into the current experience of an IDE student. Through courses that include projects and the education of design tools and methods, design students at IDE are taught to be critical, analytical and able to deal with the uncertainty in the design process (IDE, 2020). As written in the Manifesto of IDE (IDE, 2019), a design student understands the rapidly developing role of design and their own position in the design field. In this paragraph it is aimed to explore the other side; the perspective of the student.

Empathizing session
In combination with the informal interviews, an empathizing session was conducted with six Master students from all the three Masters. They were asked to map their journey over a half-year mandatory course. Firstly, the question was asked how they see themselves as designers and how they experience their education. Secondly, further questions about their experiences were asked that eventually were guiding as a support in the creation of an experience map.

Outcome informal interviews & session
Design students see themselves as someone who is open for the unknown, passionate about what is happening in someone else's mind and are part of the early adopters to innovations. They are able to think about the problem behind the given problem, have an interest in the future context and have created a unique way of thinking when solving problems. They use design methods and approaches to develop unique solutions and stay creative at the same time.

The interviewed MSc. students see IDE as a place where they find like-minded people, a place where they can be creative and talk about their personal journey as a designer, maybe too safe. The openness within the faculty allows students to discuss projects and struggles with peers and educators. However, next to the fact that IDE is a place full of minded-like people, the ambiance of the faculty is experienced as highly competitive and ambitious to be the best designer.

"My graduation consisted of many mental breakdowns."
-MSc. Student SPD

"Students at IDE are people who are visionary and always looking for ways to create a better future."
- Calabretta, 2019

"With my designs, I want to make impact and stimulate change."
- IDE student, SPD MSc. Student Interview, 2020

"I see IDE as my safe place."
- MSc. Student IDE, DfI

The changing role of the designer next to digital transformations and the high expected society, puts pressure on the student, which maybe indicates the risks of the safe bubble of IDE. Currently, the design student tends to be highly creative and wants to contribute to the challenges the world faces today. Students of IDE validated the experience of feeling pressured and the fear of failure. This is also observed by IDE educators and other research, especially in these times of COVID-19. The sense of responsibility, combined with the uncertainty of design, puts students in vulnerable positions where immense learning is possible. Yet their personal wellbeing is at risk from the very complexity within their projects. When students are not resilient to this complexity, they can be devastated and stressed by a loss of control in their projects with consequences for their evolving sense of identity (Price, 2020; TU Eindhoven, 2020; McKinsey, 2018). **The Master programs of IDE aim to prepare their students for the world outside the faculty. However, the means of preparation now, may not fulfilling the needs of the current and future students anymore**. Design graduates of IDE are visionary, imaginative and highly creative, but there is a lack of resilience in becoming confident as a designer when coping with complex situations and challenges. Moreover, the next digital generations (Kamp, 2020) will also need more attention when it comes to their well-being.

After creating the journey of one course, with the aid of the basic design thinking cycle (Plattner et al., 2009), learning cycles of the learning model of Kolb (1984) were also integrated into the journey to give a deeper insight. The map is visualized over the time span of a course that aimed to create insights consisting of challenges and needs but also moments of motivation and enthusiasm.

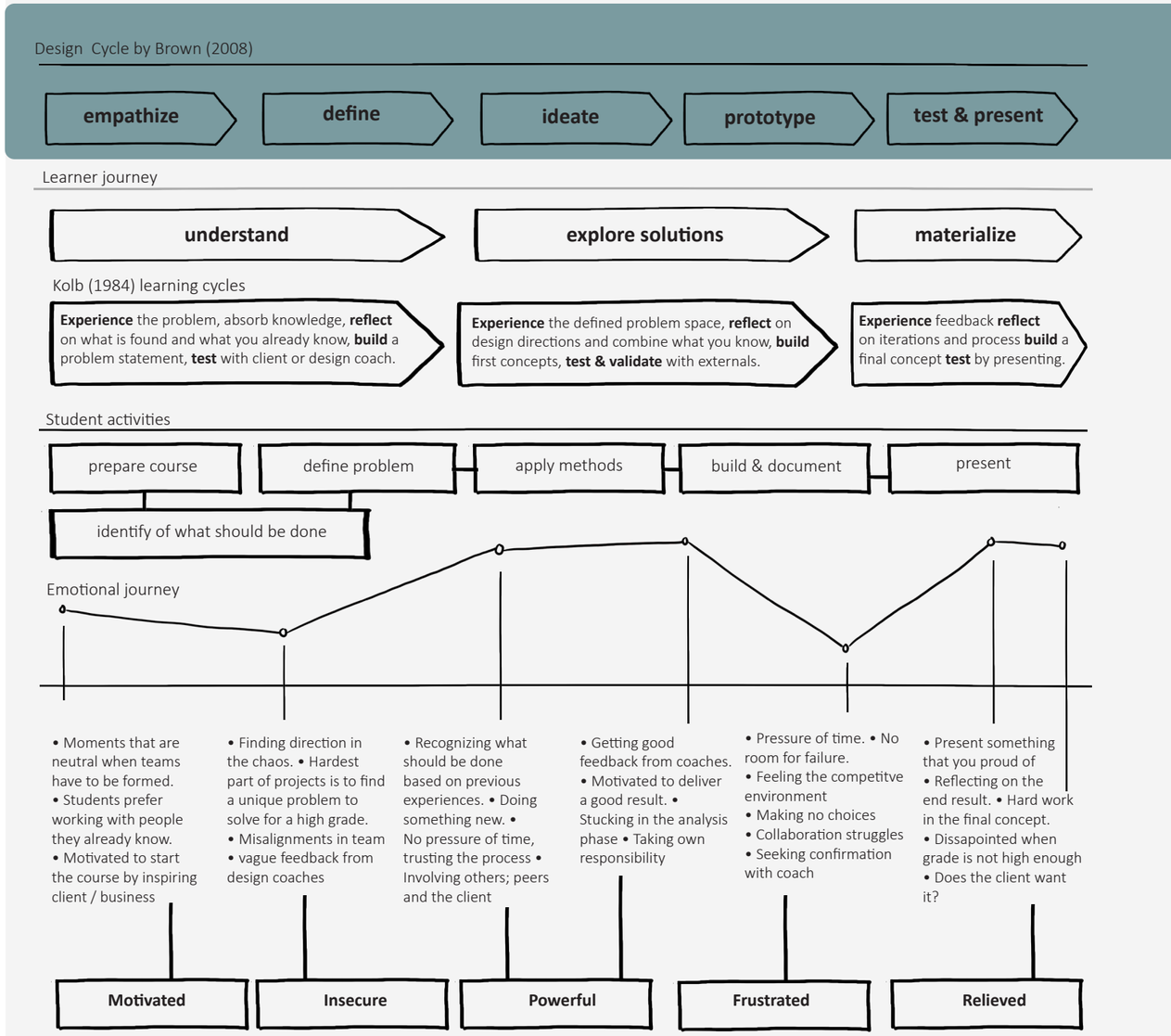


Figure 9 - Overview of the learning experience by IDE students

In the first place, the students stated that they are not aware of moments of learning in the moment. The participants indicated a sense of learning in new situations where they recognized how to cope with the given problem that was based on knowledge gained in previous experiences: "I feel good when I can contribute to projects with something only I gained in my personal previous experiences. I recognize the value of them" (p4). During the session it was asked why they were not aware of their own learning during the project. Most participants indicated the pressure and the lack of time to reflect. "I think the feeling of having less time is the biggest stress factor within IPD." (p3. This pressure of time has been negatively influencing on the well-being of designers, they lose track of the process and become stressful near the end; it prevents from asking help from educators and peers.

However, it was observed that students feel that their result is highly dependent on the educator's preferences, which is gives them feelings of frustration: "In the end, it is just finding out what your design coach thinks is a good result." (p2).

The last interesting point is contrasting behaviors towards collaborations: its struggles and its source of creativity. Collaborations often do not go as planned, a lot of moments of miscommunication and misunderstanding arise because every team member has its own goals, methods and believes. Collaborating with others is not presented as something attractive and useful by IDE. Furthermore, IDE students are interested in the skills of the other Masters within IDE as well the skills of other faculties like Informatics: "I think SPD skills would be valuable for me as well as an IPD student." (p2). "I also want to work with cool companies like SPD." (p5).

02

2.2
External research

Just like the internal research, external research was conducted through interviews among the stakeholders outside the faculty of IDE supported by some literature. This group consists of Alumni, Companies and external experts on design education outside the faculty who are from other faculties within the TU Delft and other universities. The external research was done in order to discover the world outside the faculty and further investigate statements mentioned in the initial assignment.

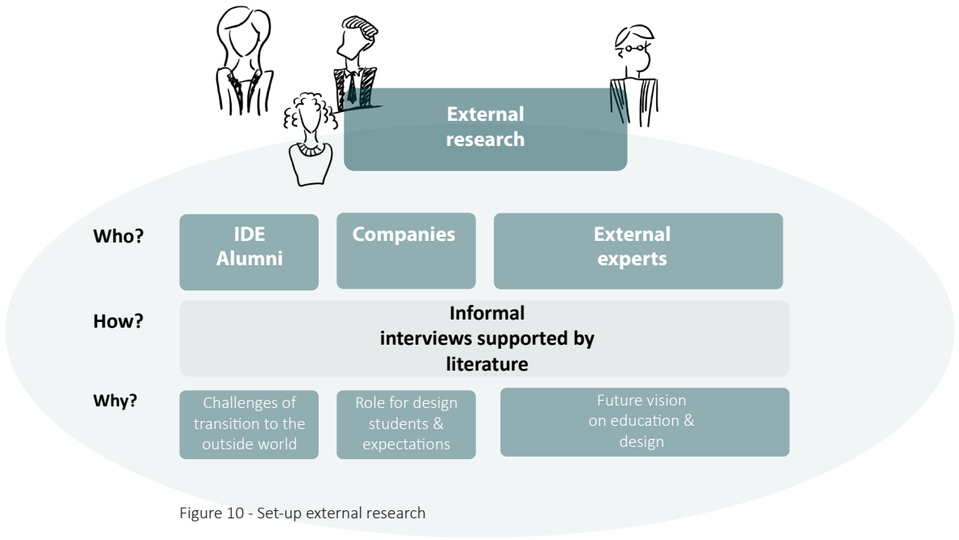


Figure 10 - Set-up external research

2.2.1
Experts on education

As the faculty of IDE is part of the TU Delft and has a broad network of other design schools, other external experts have been approached to support the understanding of the current context and what is happening in the world of education. Next to a participation of a 4TU workshop, three experts are interviewed: one from the TU Eindhoven, one from the board of the TU Delft and one from anohter TU Delft faculty.

Quotes from the interviews among the experts can be found in Appendix C.3. All insights agreed on the fact that it is time to explore the opportunities of the future and the challenges universities face with the coming era caused by the changing learning behavior of students and the fast-changing world outside university. and the investigation of the skills needed from technical students. **However, the many visions, opinions about innovating engineering educations and design, are quite differentand show the origins of the complexity of the field of education**. They forsee the disruption in education caused by digital transformations and aim for working with AI, but also focus on the social skills for technical students. Moreover, the traditional educators should not be forgotten in the innovation of new educational programs. The interviews with experts resulted into multiple visions and exploration areas towards the future.

"Keeping the quality of the students with both the digitalization and growing student population is already a challenge."
- Expert on Education (1), TU Delft

"Companies are way faster in adapting to the digital transformations than universities."
- Expert on Education (2), TU Eindhoven

"Social skills for technical students vs. the rise of Artificial Intelligence."
- Expert on Education (3), TU Delft

2.2.2
IDE & Companies

The faculty aims to use their knowledge in order to contribute to the complex challenges of society, for example in the areas of health & well-being, sustainability and mobility. Within these areas, they work together with companies, social and governmental organizations and other research institutions. This paragraph describes the role of companies within the courses of IDE next to the result of interviews among professionals that aims to explore the other side of the relationship, including the expectations and visions of towards design graduates.

The faculty of IDE has strong links with companies, organizations, public bodies and NGOs (Non-Governmental organizations), as well as its 7,000 Alumni, who bring their design skills to a wide range of sectors and disciplines on a daily basis (IDE, 2020). These partnerships with the world outside the walls of the faculty are of high value for IDE in both enriching the education of the students next to their positioning as a leader in delivering the best design graduates. Companies and organizations are involved in events, projects and offer internships in order to give the IDE student a perspective of the world outside and after IDE, especially in the Master the involvement of a real client becomes more important (Calabretta, 2019). Events organized by the student association, e.g. business tours, next to the client involvement in projects, aim to prepare students for what their job and tasks as a professional designer might look like.

The use of companies in IDE projects & events
The companies involved in projects of IDE aim to give students a sense of the real-life world where, and the other wat around, IDE offers the talented minds of its students for difficult cases. Moreover, these projects will broaden as the increasing recognition of design skills among companies such as creativity, empathic understanding, and collaboration as a general need (Voogt & Roblin, 2012), increases the demand for designers in various industries.

The other side of the partnerships
Besides the involvement of companies in projects during the education of the designer, the external research included interviews among chiefs of companies (n=4) (design practitioners of the ones who work with the designers) about the expectations of the professional designer of today and indicated the changing role of the designer observed in the initial analysis for this thesis. The insights gathered, methodology and the interview guide can be found in Appendix C. Different areas (startup, design consultancy, small design agency and big corporate) were interviewed, which resulted into four different insights of the world outside IDE. **It is the designerly mindset what triggers a company nowadays the most, what includes the knowlegde about technology and the skills to communicate design thinking broadly and use it quickly to turn fast solutions. Companies expect from designers to be analytic, critical and confident, as the design process can be perceived as something vague and difficult to conduct.** However, it is recommended to further analyze the work field of the designer as it could provide a lot of inspiration.

"I expect from my designers to turn something complex into something understandable and generalized, but also personalized at the same time."
- Innovation specialist (p2)

"Designers are also our process leaders, as they have to guide the team through the design process."
- Creative Director (p3)

"Our designers are able to adapt really quick, as we are moving to a world of services with no exact end user."
- Senior Designer (p1)

"They are the builders behind the digital solutions, but we expect them to explain them easily to our clients."
- Founder, Entrepreneur (p4)

2.2.3
IDE Alumni

After completing the Master program, students become part of the IDE Alumni group. As stated in the initial assignment, there is an increasing gap observed between the education of the designer and the job activities at companies after graduation. To investigate this gap, Alumni were interviewed for this research. The interviews includes question about their transition form graduate to design professional. These insights from IDE Alumni (n=10) are gathered in Appendix C.

This increasing gap was validated and explained by the following points: It was stated that there is a big difference in how to deal with projects. "That the environment of a company is way more fast-paced compared to university. Projects have shorter timeframe meaning you have to set different priorities as a designer." (p5) Moreover, expectations of fresh Alumni were also quite different: "My expectations were that I was able to use and combine design methods I've learned. But I missed some implementation and realization skills." (p4).

Within these projects, the hardest task in being in the working field is collaborating with people who are not used to using design but have a big role in the project: "I really need to take time to talk to the developers to communicate my design clearly." (p2). The services that the world is demanding, include collaborations with technology experts, business professionals and other many other disciplines: "As designers, we are not developers. We have to collaborate with people who have not the same mind at all to create the inspiring ideas, that are in my case digital, the outside world wants." (p4). Moreover, graduated design students often experience feelings of when looking for a job. They have high expectations of their job search, but the reputation of being a student of the TU Delft is not always perceived as not enough: "I really had to sell myself, in a motivation letter, followed by a lot of tests to get the job." (p4), "In my job search, finding a company that really understands what industrial design is was hard." (p3). These observations were already experienced by many graduate students that experience the job search as something scary, this also refers to explaining what a designer from IDE is capable of.

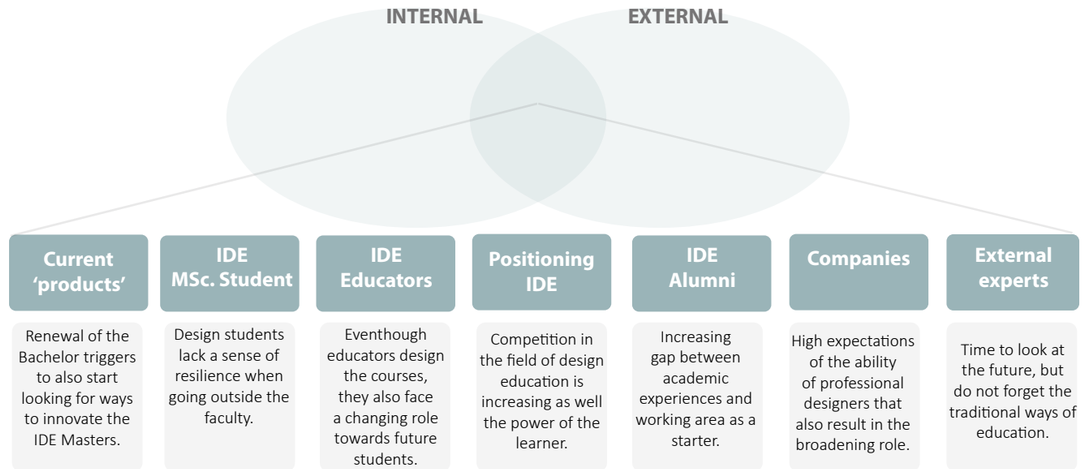
What can be concluded from the interviews, the biggest challenges discussed in this research that increase the gap are the mismatch of expectations of students next to working with people who are not familiar with people who have an education of design. IDE Alumni are the ones who stand closely to the experience of a student, but also the one of a beginning design professional that copes with insecurities and new challenges of the complex world. IDE Alumni should be perceived of high value when introducing students to the professional field.

2.3
Conclusion

This chapter ends with a conclusion combing the insights gained from the internal and external analysis of the faculty. Reflecting on the interviews and desk research about the faculty, many opinions and perspectives were gathered. This thesis tries to combine all the insights into valuable learnings and solutions for the faculty.

The results from the second chapter were analyzed and resulted into the formulation of the problem statement and refined research question derived from the initial assignment.

Figure 11 - Conclusions conducted research



The initial assignment of this project includes the development of new ideas for the education of the MSc. designer that fits the dynamics of society, which will change even more in the future. As stated in this exploration phase, the Bachelor of IDE is already in its renewal which is based on several competencies future design professionals will need, which will looked into in Chapter 03.

From the understanding of the current context, it appeared that IDE, despite their high-quality education, can already see challenge in keeping its relevancy as well its position as a leader in the education for designers. This is influenced by their limited role in multidisciplinary projects, how to respond to the digital world and the broadening role of the design profession in the working field. Furthermore, the lack of confidence of design students in outside projects and graduation, increases the awareness of the wellbeing of design students.

In this chapter, stakeholders were interviewed that resulted into the identification of challenges in the context of the initial assignment. What can be summarized from the insights is that there is a decreasing sense of confidence of the design students when entering outside the bubble of IDE. Moreover, the changing role of the designer makes the anxiety of MSc. students for the future even greater. Combing the future vision on design, with the gained insights form the conducted research, the problem statement formulation for this project is the current offerings of the IDE MSc. programs are not perceived nor experienced as a means for students to be fully prepared with the skills that are needed to behave in the world outside after graduation.

It is time to start decrease the gap between the outside and IDE, guarantee relevancy as a leader in design education and offer students the learning experiences they need. This thesis aims to investigate opportunities to prepare the next generations of Master students with learning experiences that are offer contemporary skills and are valuable for the long-term. It is decided not to focus on one Master program, but all three as a whole. And eventually, advise the faculty of IDE on what areas to focus on in the education of IDE MSc. students. Based on the insights of this chapter and the initial assignment, the question to be answered in this thesis is formulated as following:

What learning experiences are seen as most valuable when entering the world outside IDE and contribute to the preparation of the IDE MSc. student?

RESEARCH QUESTION

03

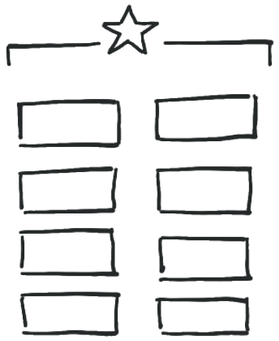
Envision the future

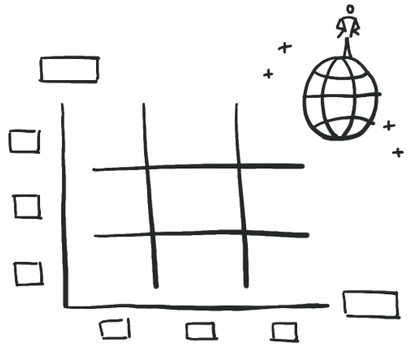
This chapter shows the development and exploration of the future context in order to identify gaps for relevant innovations for learning experiences at IDE. The future context developed through the steps of the ViP approach that resulted into a two-dimensional framework unfolding the future behaviors of IDE students that guided as starting points for design.

03

3.1 Envisioning approach

In order to create a holistic view about the future context that will eventually help to investigate multiple solution spaces for designing new learning experiences for the IDE MSc. student, steps of the ViP approach were used. The approach includes the definition of the domain, followed by collecting factors, clustering them into driving forces, and eventually creating a future worldview that is based on the relations between the driving forces of the future. This paragraph describes the approach of the development process first of the future context in order to increase the understandability of the results.





3.1.1 Domain Definition

The first step of developing a future context for IDE is **the definition of the domain where the designed concepts aim to contribute to**. In this project for IDE, the definition of the domain is determined as:

“Education of the designer in the future.”

The formulation of the domain can be perceived more flexibly than just the ‘future of IDE students’. Based on insights of the previous chapter, the education of the designer is influenced by many developments and trends of the fast-changing world that include digital transformations and different learning behaviors. Moreover, the changing values of external parties have an influence on the learning experience of the IDE student as well.

With this definition, the intersection between educational developments and the future meaning of design in this digital, complex and intertwined world can be analyzed in order to form an understanding of what implications the future has on the education of the designer.

3.1.2 Collecting Factors

After the domain is defined, a broad exploration of factors can start (Hekkert & van Dijk, 2011). Factors are collected from the previous research, followed by an extensive literature research. **The factors are value-free descriptions of world phenomena as they appear derived from literature (Hekkert & van Dijk, 2011), covering demographic, economic, psychological, social, educational and technological areas.** In this research, the fields of education and technological may seem the most relevant, but it is important to not sort out factors from others; Factors that at first glance seem to have nothing to do with the domain, might turn out to be the most original and influential (Hekkert & van Dijk, 2011). Subsequently, the factors are divided the four types of factors based on characteristics: developments, trends, states and principles. The selection of factors is based on their relevance towards the domain, freshness, attraction and originality.

More than 250 factors are collected for this research. The formulation of the factors is already written in an analytic form, this helps to look further than the traditional way of data collection. The whole list of the collected factors can be foundin Appendix D. Additionally, the project gained more specific insights from the participation in a 4TU workshop, Education Day 2020 organized by the TU Delft and experiences of the author as a teaching assistant.

3.1.3 Formulate the Driving Forces

After the collection of factors, further analyzation results in the combination of factors into clusters. The idea behind forming clusters is to connect factors into future stories, instead of grouping them by similar information. The clusters can be seen as main patterns that influence the future context of the domain. The clusters are highly important for the understanding of the future context and will create a solid basis for both future context and start of the design phase. After the final clusters are formed, the clusters are called driving forces of the future.

The analysis generates eight driving forces that are formulated in expressions of the future: Technology Take-over, Organized Complexity, The Ongoing Self-development, A World in Flux, A New Vocabulary on the Mental state, The Modern Purpose, Beyond Walls, and Equivalent Collaborations.

Among the driving forces, some of them are more related to the future of the role of design and technology, while others are focusing more on the future of learning, personal development and education. Some forces involve information of both design and education. On the next page, short descriptions of the future drivers can be read. The whole stories towards the future can be found in Appendix E.

3.1.4 Create the Future Context

To understand the underlying relationships between the driving forces, a two-dimensional framework is created that aims to give a more concrete, systematic image of the future context of the domain. **The framework enables the designer to step into the shoes of the IDE student during their education and understand the future of the education of the designer.**

Within the developed framework, patterns of combinations between the driving forces are developed. Each combination aims to embrace all the stories between of the driving forces. The two-dimensional model aims to represent a coherent whole of the driving forces and to guide as as a vision of the domain of the education of the designer in the future. These combinations between the forces are called practices that describes the orginated situation.

The framework is a means for understanding and exploring future with its underlying needs (Hekkert & van Dijk, 2011). In this thesis, it is investigated which practice to focus on in development of new learning experiences that answers the research question formulated in this thesis.

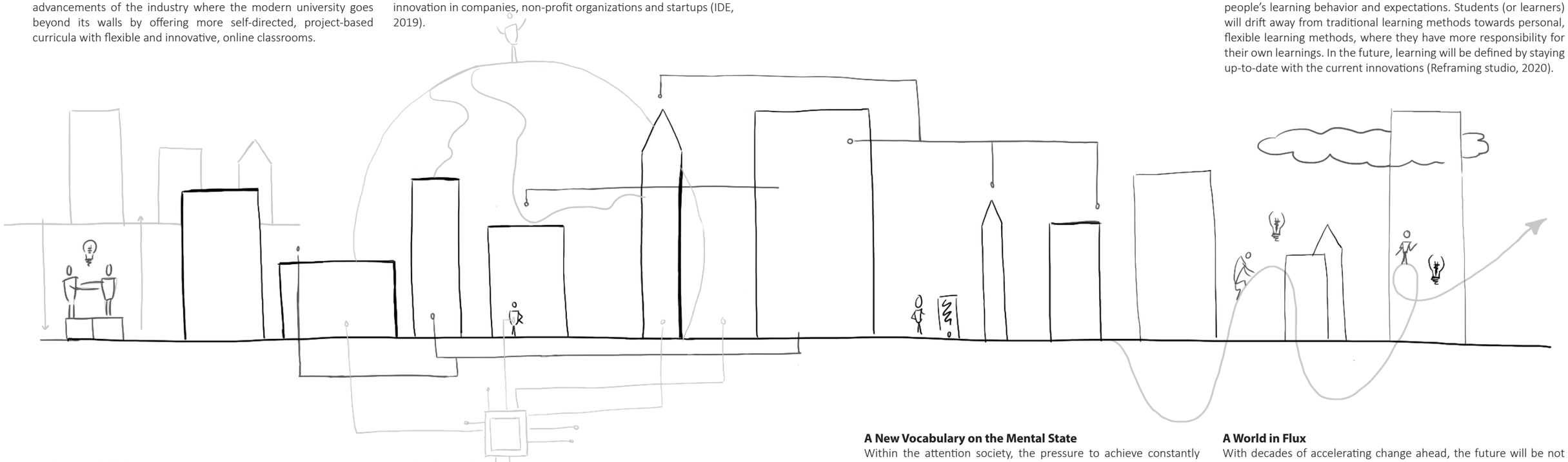
03 3.2 Driving forces

Going Beyond
Technology enables people to behave like 'digital nomads': they can work, study, communicate and collaborate at any time, wherever they are (Reichenberger, 2018). By 2030, people will not be limited anymore by their disabilities, knowledge, profession and location (Accenture, 2020). Students have the access to a broad range of different kinds of disciplines and knowledge, supported by strong international relationships formed between universities and other partners and industries (van Eijk et al., 2016). People have the ability to learn parts of every profession that supports the development of broadly developed individuals.

Younger generations are exposed to actual challenges and advancements of the industry where the modern university goes beyond its walls by offering more self-directed, project-based curricula with flexible and innovative, online classrooms.

The Modern Purpose
Challenges like climate change, declining biodiversity and sustainability have gained more attention and consumers attach value to sustainable products in order to contribute a small part. The world is breaking record after record when it comes to global warming. People develop a deep desire to contribute to the understanding of complex problems in both working and private life (Voûte et al, 2020).

In the future, more and more professionals will strive for more from their job than just a paycheck (Gaskell, 2017). Motivation, ambition and initiative will be of great value when taking risks. The new, working generation is entrepreneurial, responsible and will thrive innovation in companies, non-profit organizations and startups (IDE, 2019).



Equivalent Collaborations
In the future, equality between age, class, religion and language and ethnic origin is still very relevant. The high connectivity of the world offers people a voice, but also the ability to put everything into question when it comes to equal opportunities. The society has the desire to create equal opportunities for everyone at every level where the value of individual is recognized and respected.

Transparency and inclusivity become more valued in order to increase trust within teams (Buß, 2020). Hierarchies will fade within collaborations, but also within the organizational structures of companies (Lampel et al., 2019). This is also reflected in the educational sector, collaborative learning experiences are stimulated, where both educator and students learn together (Calabretta, 2020). In order to better prepare students for the future world of equal collaborations, beneficial collaborative experiences will be stimulated between different study backgrounds, but also with companies outside university.

Technology Take-over
With the innovation of technology, networks have been developed, and single mass-produced products are transformed into product-service systems with many components and actors (Voûte et al, 2020). Services and products are invisible in the daily routines of people. They made people's lives and relationships smooth and easier. However, it also may have amplified feelings of isolations and loneliness (Katz, 2020).

Technology has disrupted education. Students will be prepared for a globalized, knowledge-based world driven by technology, where learning is supported by blended learning experiences that are creative, connected and collaborative (Fullan, 2013). Students will have a full responsibility over their own personal learnings (OECD, 2018) and the role of the physical faculties and places has become smaller.

Organized complexity
The professional designer's view is widening from the single user to include context and societal issues that are connected and intertwined. In the future, professionals will be aiming for the goal to organize complexity. With trying to find solutions or be prepared for those, the relations, dynamics with unexpected outcomes should be taken into account (Funke, 2012). This results in bigger problem-solution spaces.

Professionals need to solve never-before-seen and highly complex problems, together in order to create the ultimate and valuable multi-angled view (Funke, 2012).

Ongoing Self-development
On-demand access is valued over owning (Gidopoulos, 2019). With all the information and opportunities available, people have the opportunity to behave in an area full of chances for continuous self-development. The fulfilment of individual, immediate needs and experiences by products and services is supported by a transformational economy, where people want to continuously transform themselves in better persons on the longer term (van Eijk et al., 2016). This transformational economy is continuously triggered by the constant streams of data and chances of that our digital world gives.

The need for on-demand flexibility and personalization is reflected in people's learning behavior and expectations. Students (or learners) will drift away from traditional learning methods towards personal, flexible learning methods, where they have more responsibility for their own learnings. In the future, learning will be defined by staying up-to-date with the current innovations (Reframing studio, 2020).

A New Vocabulary on the Mental State
Within the attention society, the pressure to achieve constantly is increasing among the young professionals and students. They experience a feeling of fear that everything they do, will still not be enough and that is no time for failure (IDE, 2020; 4TU, 2020). New ways of vulnerability are developed along with the rapidly changing world. Next to increasing privacy and ethical challenges, that the digital world brings with its innovations (van Eijk et al., 2016), mental challenges of individuals are getting more attention, especially after the mental reaction of the global pandemic.

Future societies face questions on how to deal with the pressure to preform and how it can be relieved in order to deal with and prevent both stress and burnouts. Mindfulness, self-rest moments are becoming crucial, and are seen as a means to find happiness and peace in life (Kristensen, 2018). A new vocabulary on the mental state in this technology-fed and high-speed world will be formed in order to break the taboo about mental illness and deceases. Going offline moments will become more important to keep a healthy mind.

A World in Flux
With decades of accelerating change ahead, the future will be not just a simple linear extension of the present. Due the speed of changes, people and companies are aware of the fact that they may not be able to keep up and 'will lag behind'. With the automation of jobs in relation to the fast pace, people become afraid of being replaced by technology (Thaesis, 2019). Together with the high speed of unexpected, complex challenges, it forces people, companies and governments to look for quick fixes and fast solutions instead of thinking on the long-term. It becomes hard to cope with both complexity and speed of the fluxing world at the same time. In order to describe this 'world of change' or 'uncontrollable environment' people are living in, acronyms like the word VUCA arise. VUCA stands for volatility, uncertainty, complexity, and ambiguity (Kraaijenbrink, 2018).

The new generations should be educated to be prepared, to thrive and still live in this world of flux so they are ready, no matter what comes next. Students will be taught to be creative and adaptable in both individual and collaborative settings.

03 3.3 The future context

This paragraph shows the final future context designed for the future of the education of the designer. First, the framework and its dimensions are explained, followed by unfolding the underlying behaviors within the framework. The two axis of the framework describe the relationships and interpretation between the driving forces. What needs to be mentioned: Each driving force is handled equally, so no hierarchy between them is created.

To begin, the framework for the future of design education has two overarching clusters. The clusters placed among the drivers should be seen as different expressions of the two driving forces.

On the vertical axis of the driving force **The Modern Purpose**, the clusters of Organized Complexity, Equivalent Collaborations and Technology Take-over are placed. The vertical axis means to describe the values of both design and designers in the future world. The global challenges ask for new, daring and innovative solutions. Designers will find themselves in finding broader purposes in both societal and global challenges.

The three clusters describe different expressions of the overarching force. People react on the complexity of the future challenges by demanding more organized, personalized services and solutions that are easier to understand by the collective. Designers will disarm complexity by embracing it. In order to work in this world of complexity, collaborations between diverse disciplines are needed to tackle the interwovenness of challenges, but people demand a way that collaborations are diverse, transparent and every profession is valued equally. Moreover, as technology is taking over people's life, people respond with new fears and distrust, it becomes the job of the designer to use and understand new technologies and smoothen out the fear of tech.

On the horizontal axis of **A New Vocabulary on the Mental State**, the clusters the Ongoing Self-development, A World in Flux and Beyond Walls are placed. In the growing complexity of people's lives, the pressure of achievement is high and the amount of young people with a burn-out is increasing. The overarching force means to describe how education can support students to process knowledge in a mentally healthy way, both in private and professional life. People find themselves taking every chance, opportunity that our digital society has to offer. But the mental health of people suffers and people feel the necessity to put their mental health first by escaping from the exhausting impulses around them.

In the expressions of the overarching force, the first cluster from the left shows that people are never finished learning, especially not in the future, where learning will be seen as staying continously up to date and in this way, relevant for the labor market. Self-development becomes a priority in life that expresses in the needs of more personalization and effiency. Moreover, people aim to build a shield against the high speed of changes, becoming resilient against the flux and learn how to adapt in the real-life world. At last, the last cluster right, describes the high accessibility that created by the increased connectivity of our world. People become aware that they can go beyond the limits of their own knowledge and profession and use the power of the collective to learn more than before.

3.3.1 Unfolding behaviors

The developed framework portrays the interplay of the driving forces resulting in the identification of nine critical behaviors between a design student and its education, also called practices. The practice includes a general description of the future setting within the education of the designer, that also tries to integrate the challenges of the world outside IDE when two driving forces are combined and where the behavior description aims to focus on the IDE student.

The originated behaviors indicate needs of the future IDE student in their education, influenced by future expressions of design as well the value of education in the future. The formulation of the behaviors is often described as undesired, but in this way, it offers opportunities for new design directions that turns the undesired situation into a desired one.

Some of these practices may already seem quite familiar, but also latent or undetected practices can be unfolded that already had been present for some time. These practices, novel or familiar, would drive the most relevant behavior to respond to with a design statement. Services that address these practices, will often resonate with the user and will likely be successful (Hoope & Hekkert, 2016). For designing with the aid of the model, each practice has a first set-up of a mission statement, which describes what the desired effect of the designer, and in this case, the faculty, will have on the future practice (Hekkert & van Dijk, 2011). The mission statement forms a starting point for the design vision for the ideation phase. For the overall explanation of a practice, see Figure 12.1.

Figure 12 gives a presentation of the developed framework including all driving forces and the practices created based on the combination. It was aimed that each practice includes a different design direction. In this way, **the framework embraces diversity of possible behaviors that reflect the needs, desires and concerns in the future of the education of the designer.** All nine practices are further explained in Appendix F.

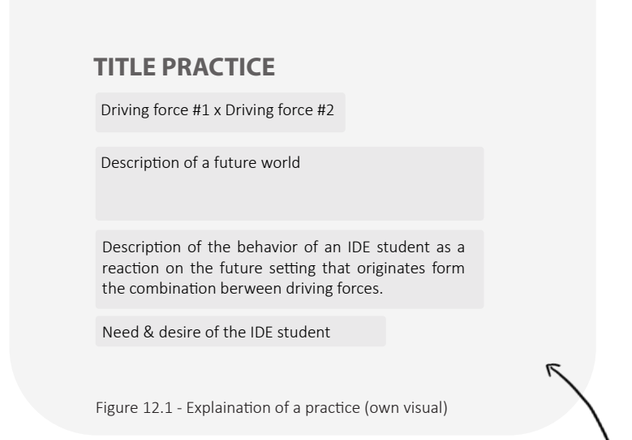


Figure 12.1 - Explanation of a practice (own visual)

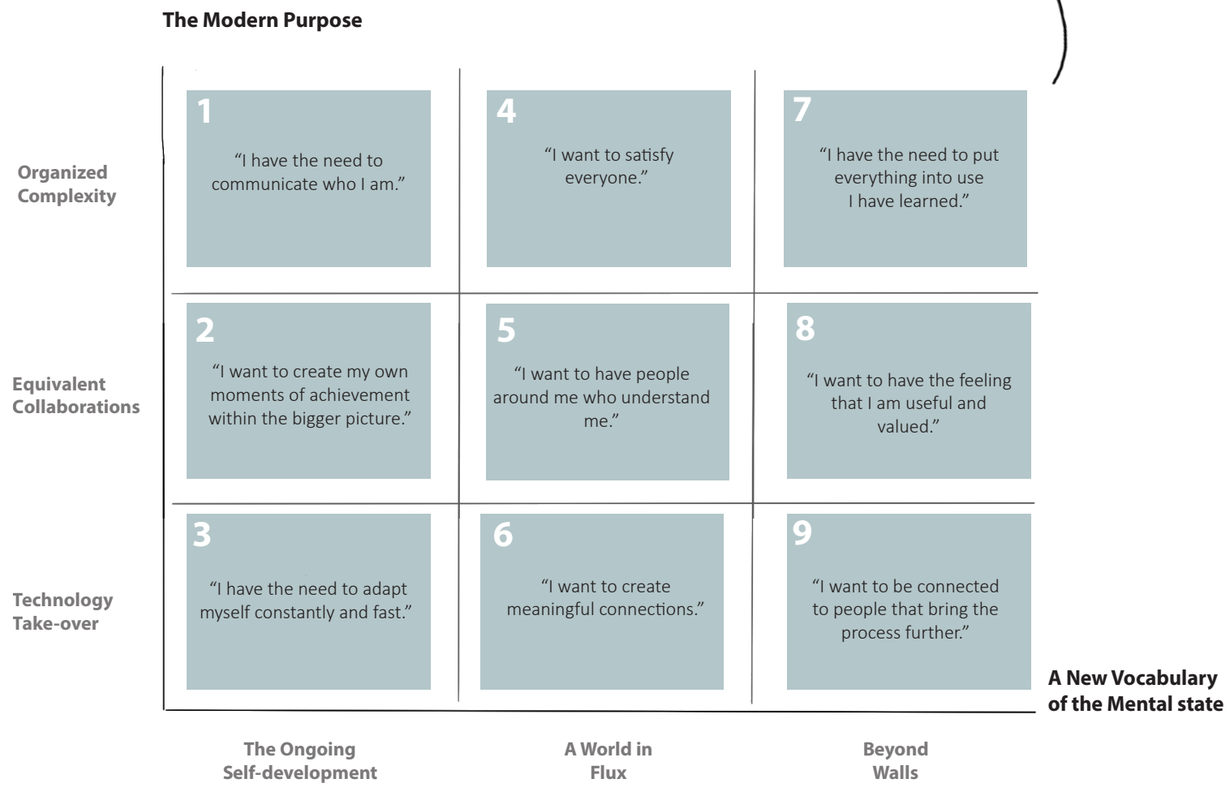


Figure 12 - Visual representation of the framework (own visual)

As stated before, the practices orgininated in the framework describe settings, behaviors and needs of the IDE student during its education in the future setting as a the combination of the two driving forces. All nine practices could be perceived as sources of inspiration for new learning experiences. Each practice has its own focus and direction, which differs from an individual experience of the student to a learning experience that is more dependent on the others around the student. What should be mentioned is that the framework does not directly indicate behaviors a design student 'should have' to cope with the future. The framework only presents behaviors as a reaction on the future of students that could be reponded by the faculty through learning activities that enhance their learning. In Figure 12, the needs only are visualized, but can be transformed into intial design statements for example, when it is stated that an IDE student has the need to communicate who he or she is, a new learning experience could support that need. In order to find the most valuable practices, the next paragraph describes the evaluation of the framework.

03

3.4 Evaluating the future context

This paragraph describes the evaluation of the future context by looking critically to the initial mission statements and formulated behaviors with the aid of the core competencies of design (Conley, 2011; Voûte et al., 2020) in order to investigate the value of a practice. The core competencies of design are previously developed by Conley (2011) followed by an improved version by the IDE faculty itself (Voûte et al. 2019) that were used for the Bachelor renewal.

Core competencies of Design

Accoding to Conley (2011), there is little support in the definition of the core of design, especially now with the broadening role of designers in the world. The benefits of understanding design and having a clear definition of professional competence are significant. However, to be more credible, Conley (2011) argues that design must understand its successes and, perhaps more importantly, its failures. Conley (2011) formulated seven core competencies of designers that currently describe the skills of designers in the professional field. A research team of the faculty updates the design competencies for the present day (Voûte et al., 2020) into five competencies for the IDE designer, which are both visualized in Figure 13. The competencies provide more specificity than definitions of design skills that emphasize creativity. Moreover, the developed competencies point to the broader value that design expertise can bring to areas of organizations beyond the design department that fit the goals of previous research conducted in this thesis. In both research the further development of the translation into real-life activities is missing (Voûte et al., 2020) (Conley, 2011). This thesis aims to contribute to developing experiences that support the translation of the core competencies in a real-life setting next to answering the needs derived from the framework.

Supervisory team & experts

All practices are discussed within the supervisory team to validate the understandibility and already define familiar ones, non-familiar ones and ones that seem inspiring. This was also supported by sessions with two external experts within IDE about the practices, which were held in order to iterate on the practices. The more overlap between the current (Chapter 02) and future settings, the more familiar the need of the student will be and is neccessary to develop further. As Alumni stated in Chapter 2.3: “It was hard to collaborate with people who are not minded-like” this would match with the nineth practice.

Together with the design competencies, internal and external research insights and the additional conversation, the whole row of “Equivalent collaborations” is selected to be analyzed further and guide as a starting point for formulating the design focus. However, all practices were perceived as interesting, but the most valuable are presented below.

To answer the research question, stated in Chapter 2.3, these practices, focusing on the individual student in the whole (practice 2), learning to share in order to create mutual understanding (practice 5) and learning how to collaborate with other fields of disciplines (practice 8) are perceived as the most valuable for IDE MSc. students to learn as design student as in towards their professional career. The following chapters present ideas of the translation of the future settings into ideas for new experiences for IDE MSc. students.

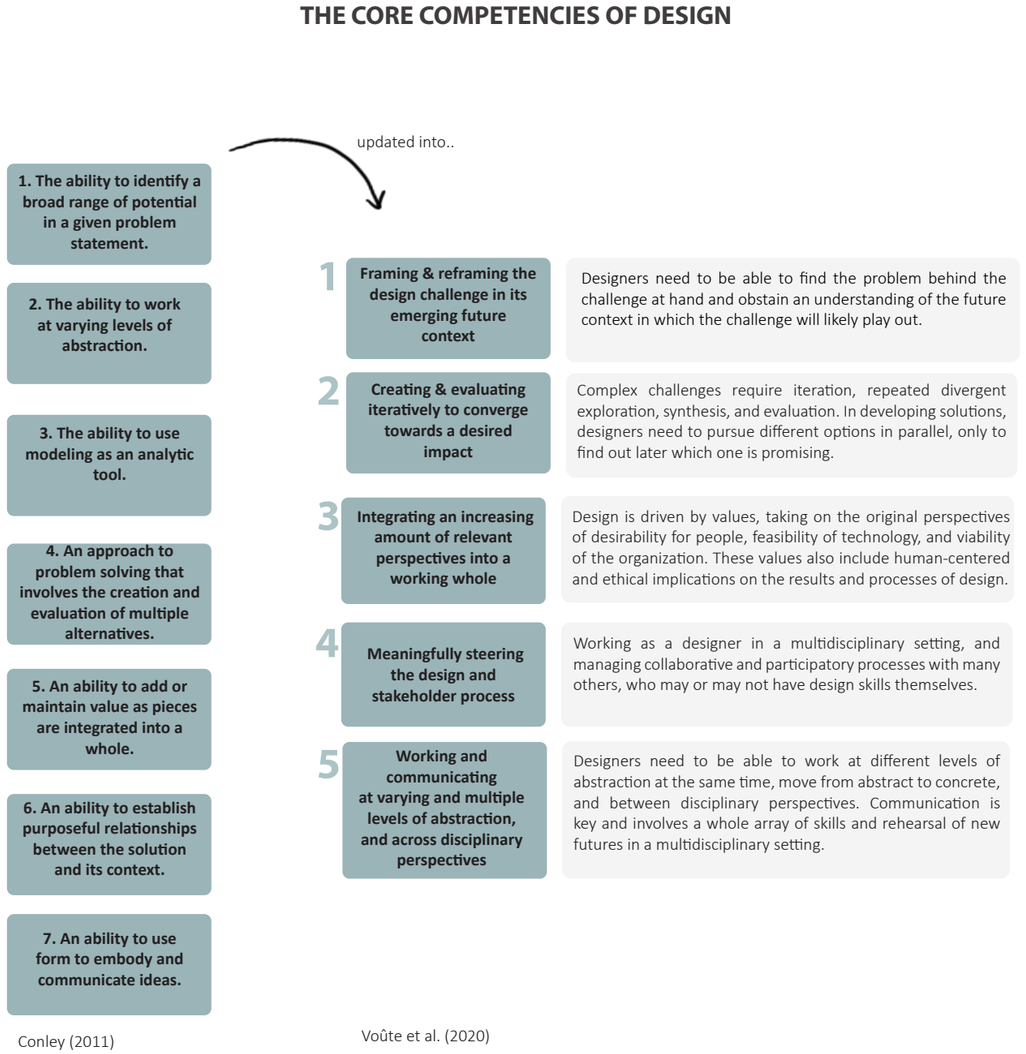


Figure 13 - Core competencies of Design by Conley & Voûte et al. (2020)

04

Design focus

The design focus of this project is the transition between the two diamonds of the design process. This chapter describes the outcomes of the last conclusion into a design focus consisting of three different design visions based on the three selected practices.

04

4.1 Design Visions

The design focus includes the design visions derived from the practices chosen in the evalutation of the framework. This paragraph describes the design visions of each practice that include a reformed mission statement, an interaction vision and experience qualities. The design visions aim to inspire the further ideation phase. **It is important as a designer to fully dive into this process and be open to the opportunities which created mission statement offers.**

4.1.1 Final Mission Statement

As stated in Chapter 3.4, the chosen practices with its inital mission statements were discussed and iterated. Final statements were formulated in consultation with the supervisory team. As they are not the final user, the mission statements were also discussed with students (familiar to ViP) to ensure an equal understanding and student fit. Based on the needs and behaviors described in the practices, the statements were developed, which are presented in the next pages.

The mission statement is composed by the identification of the 'why' and 'how' of the future intervention. Both are seen as relevant parts in the design process and generate different values exchanged among the different parties involved.

4.1.2 Interaction Vision

As stated in the first chapter, the definition of a learning experience does not only include the delivery of a set of knowledge blocks during courses. It also involves any interactions between students, educators, third parties and other touchpoints that transform the perceptions of the learner, facilitate conceptual understanding, yield emotional qualities, and nurture the acquisition of knowledge, skills and attitudes (UNESCO, 2013).The core element of expertise in ViP design consists of the understanding of what kind of relationship, or interaction fits a specific context (Hekkert & van Dijk, 2011). For each mission statement, different analogies are thought of as it was adviced to keep the uniqueness of the three practices. As thinking of analogies and qualities is seen as something quite difficult, multiple students that are familiar with the ViP method participated in brainstorm sessions.

An interaction vision is chosen to accompany the statement in guiding the design phase. To give a feeling of how the mission statements aim to deliver value to the IDE MSc. student, an analogy is used to describe the desired future interaction vision.

The interaction vision describes what the interaction between an IDE student and its education should feel like. This opens design directions for ideas that contribute to the innovation of the education of the designer that are based on multiple future needs.

4.1.3 Experience qualities

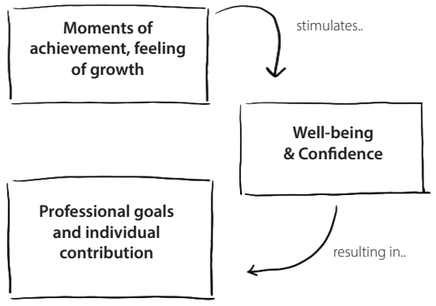
Within the analogy, qualitative characteristics can be thought of that can be translated into experience qualities. The defined qualities make sure that the new ideas embody the intended interaction between a student and its education. Defining those qualities is the last link between the three major stages of ViP (context, interaction and product stages). The task includes stepping out of the subject for a while in order to 'feel' and 'describe' the interaction. It is important to take into account that the chosen interaction vision and the defined qualities function mainly as input and guidance within the process of designing an engaging learning experience.

To elicit the given interaction vision formulated for each statement, experience qualities for the future designs are developed.

I want students to be able develop their own moments of achievement in the never-finished processes of life by supporting them in the development of a mindset that focuses on indiviual growth in the collective.

A future description
The practice that originates the combination from the two mentioned driving forces, describes a future that shifts education from being result-focused to process-focused. The practice desrcibes: while becoming in the ongoing development process of 'never finished' concepts, the practice describes the need of IDE students for a feeling of achievement for themselves as an individual in the collective where individual focus is desired. This individual growth is very important, especially in these fast-changing world and the increasing awareness of the well-being of students. The well-being of student is becoming more an important factor in the academic success as it stimulates the students to set both study-related and professional goals (Price, 2020). When students are more aware of what they want to achieve and can create their own journey of learning, they know what they can contribute to a team.

Well-being triggers the motivation to find out what students want to achieve in their studies and who they want to become (Seifert, 2004). With all the opportunities the future world will offer for personal development and even in the design process, it becomes crucial to create a sense of peace of mind and to focus on what desired goals are important in the life, outside the faculty. However, in high-intense projects with multiple disciplines, it becomes less a priority to incorporate spaces that create a climate where there is time to reflect, decide and meet on learning goals of developing self-esteem, exploration of other skills outside the profession and personal growth. In this practice, it is aimed to prepare design students for the outside to support them in creating their own path and making their own decisions.



Mission statement
This mission statements supports the development of a mindset among the IDE student that helps them to create their own feeling of growth and achievement while always thinking for the collective. These moments of achievement support the process of self-development and exploration as well as the well-being of the student. When becoming more aware and confident of your own, the value of contribution increases.

Interaction vision & Experience qualities
The analogy of living by the 80/20 principle is selected to describe the future interaction. The 80/20 principle is not about doing less work, but about finding the most valuable areas (Koch, 2011). The most interesting thing about the principle is the ability to analyze goals and tasks in a different way. The 80/20 principle is a guide that will help students to understand distributions, no matter what the numbers are. The analogy of the 80/20 principle envisions the support of students in their decisions to feel confident in their individual journey that eventually is more valuable for the collective.

The 80/20 principle gives students a manner to balance their own development. The attractiveness of reaching goals effectively is high. Moreover, living by the 80/20 pushes students to make a decision based on their intuition on what they feel, or think is best. With this mission statement and described analogy, students are supported to take advantage of the future practice by focusing on what is relevant for themselves. Experience qualities derived from the interaction vision are:

Like living by the 80/20 rule

Balancing, Attractive, Intuitive, Decisive

Figure 14 - Goal of the first Design Vision

04

Design Vision #2

Equivalent Collaborations x A World in Flux

I want students to be able to understand the value of being vulnerable about their experiences by introducing them to a new culture of reciprocal learning relationships between design practitioners.

A future description

The practice that originates from the combination of the two mentioned driving forces aims to describe a shift in the education from where the student becomes the educator as well as the learner of its own education. Sharing experiencesbecomes the main way of understanding what is happening around us instead of books. Students become more dependent on each other's experiences as they are perceived as a more realistic and trustworthy reflection of the world outside instead of the methods and knowledge offered by university.

Sharing experiences increases transferable social and communication skills and in affective functioning which results in an increased self-esteem (Topping, 2005). However, in the described practice, students find themselves in the challenge of sharing experiences as they face the anxiety of not being understood by others. Students seek for people who understands them easily and recognize the problems they face and give them a sense of confirmation and reassurance. These lack of communication skills and confidence could have a negative effect on the job activities of the professional designer in the setting of collaborations with non-designers. Especially, in the communication of the development process as well as reflecting and discussing unexpected situations. Clear communication of the design process becomes more important in the future roles of design professionals (Conley, 2011). Comparing it to the current Master education of IDE students, sharing experiences between students is limited and behaves in a competitive environment that increases the pressure of students even more.

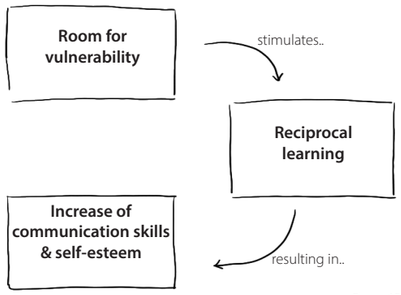
Mission statement

The mission statement formulated for this practice goes further than collaborating together. It values being vulnerable as a strength to communicate better with peers, learn from them and help others in the context of a reciprocal culture consisting of students, educators and design proffesionals. By helping others and communication skills of the students are improved, life-long learning from other people around is stimulated where confidence building is supported, which is valuable for the career after IDE. Within the mission statement, the future opportunities of peer-to-peer learning is slightly integrated. Interest in reciprocal tutoring has greatly expanded, since it enables all involved to function as both learner and educator, aiming for equal opportunity involvement (Topping, 2005).

Interaction vision & Experience qualities

For this practice, the analogy of 'being with a life-long friend' is selected to describe the future desired interaction. The to be developed experience supports people to feel being in a safe space with no judgements, but motivates the sharing of diverse experiences that eventually stimulates creativity (Tadmor et al., 2012). Also, getting feedback is more appreciated and the goal is to search for solutions together instead of being ashamed of your challenges.

The analogy of being with a life-long friend, offers students to be reminded again, refreshed but feel supported at the same time. A life-long friend is seen as someone who is equal to you and knows who you really are. Experience qualities derived from the interaction vision are:



Like being with a life-long friend

Refreshing, Supportive, Equal, Authentic

Figure 15 - Goal of the second design vision

Design Vision #3

Equivalent Collaborations x Beyond Walls

I want students to be recognized as both designer and teamplayer in complex challenges that bridges everyone's ability to become a designer by empowering them to build a common language first, that exploits the education of the designer beyond its profession.

A future description

The practice unfolded from the combination of the two driving forces, describes a future where the value of design in projects and complex challenges is bigger than ever. The practice proposes the transition of the education towards multidisciplinary settings consisting of collaborating and learning with other study backgrounds, faculties within the TU Delft or outside, and companies. This new setting stimulates challenge-based learning more that involves the complexity of the real world outside the faculty and prepares designers for their role as a collaborator and teamplayer in multidisciplinary teams. Learning how to behave towards these challenges and the collaboration skills gained will be valuable for the longer-term.

Even though the diversity can be a source of creativity (Bassett-Jones, 2005), those collaborations can be difficult and students might not learn what educators want them to learn (4TU, 2020). A team consisting of multiple disciplines, consists of different working ways and other mindsets towards projects, will not make forming a common language easy. IDE students as the designers in the project, find themselves in the need to feel valued and useful within the collaborations and contribute with their designerly way of thinking.
Not only for design students it becomes relevant in their prepraration for their future jobs to collaborate with non-designers, also for other professions it is interesting to work with the designerly way of thinking. Within a learning experience that is focused on collaboration and diversity, students have the opportunity to go beyond the knowledge that is only provided by their own profession.

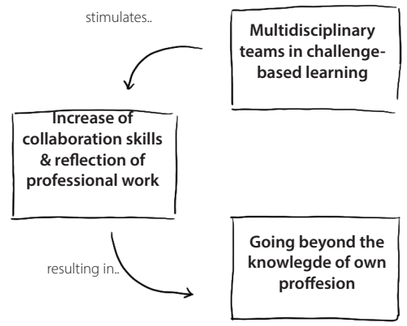
Mission statement

The mission statement supports IDE students to go beyond their own profession by collaborating with and understanding other disciplines, e.g. relevant fields like Informatics or Data analytics. To build effective ways of collaboration, a common language between the teammembers has to be build first that can be further improved over the time. In this part, designers can play a big role with their holistic and systematic approaches.

Interaction vision & Experience qualities

The analogy of "the dynamics of a rugby team" is selected to describe the future interaction, where a team tries to go the distance line as a unit, passing the ball back and forth. This analogy was already used for the product development process by Jeff Sutherland and Ken Schwaber conceived as the scrum process in the early 1990s (Suhterland ,2004). The term scrum came from interplay between rugby players refers to the teamwork achieving a common goal. In the interpretation of this practice, the interaction between rugby players can be felt as unifying and creative. It emphasizes a constant team interaction to get from the start to the finish together.

Like being in a rugby team, the combination of many powers will make students feel powerful, as they are not alone in tackling the complex challenges. The diversity of roles within the team ensures creativity but also unique opportunities to collaborate. To eventually win the game, tackle the complex challenges, professional approaches are developed together that keeps the progress going. Experience qualities derived from the interaction vision are:



Like the dynamics of a rugby team

Powerful, Collaborative, Diverse, Professional

Figure 16 - Goal of the second design vision

DESIGN FOCUS

Design Vision #1

I want students to be able develop their own moments of achievement in the never-finished processes of life by supporting them in the development of a mindset that focuses on indiviual growth in the collective.

Design Vision #2

I want students to be able to understand the value of being vulnerable about their experiences by introducing them to a new culture of reciprocal learning relationships between design practitioners.

Design Vision #3

I want students to be recognized as both designer and teamplayer in complex challenges that bridges everyone's ability to become a designer by empowering them to build a common language first, that exploits the education of the designer beyond its profession.

05

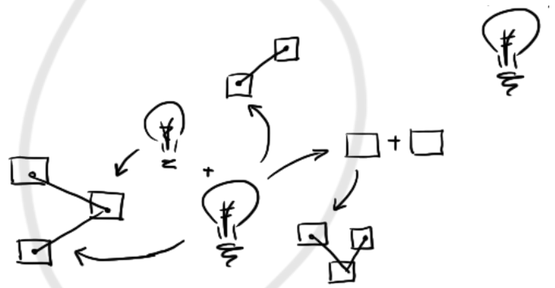
Create the learning experience

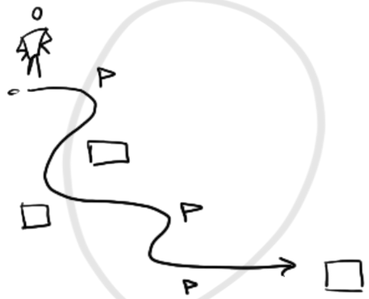
In this Chapter, the final design is presented resulting from a deep ideation process that started with the three design visions developed in the previous chapter. The final design is presented for the whole Master experience consisting of three learning experience concepts.

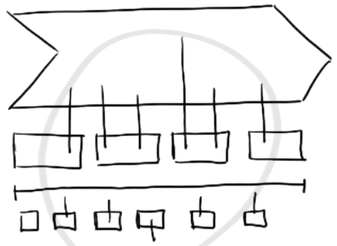
05

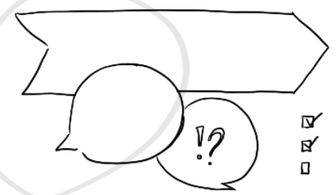
5.1
Ideation approach

This paragraph describes the ideation approach during the develop phase. Due to the circumstances, co-creation sessions were held online over Miro and Zoom. The ideation phase can be divided into four cycles, where in the last cycle validation takes place and the last iterations were used for the final recommendations.









5.1.1
Value exchange & first ideas

After the creation of the mission statements, interaction visions and qualities of the to be developed experiences, another brainstorm was held with three IDE students. First, the mission statements were presented, followed by the interaction vision and experience qualties. The aim of the session was to determine the desired value exchange between an IDE student and its education in order to think come up with ideas. **The value exchange is defined by the imagination of what roles both faculty and student play in the setting of the mission statement, analogy used and experience qualities.**

To continue with the ideation, each quality was explored through “how might we..”. **Results from the seperate brainstorm on each quality were combined in a systematic way where the ideas from the experience qualities are translated into tangible experiences**. The combinations gave a direction for the development of a new course, learning activity , event or a service that supports the learning of the student. For each design vision, all experience qualities were brainstormed, combined and first ideas were generated.

5.1.2
Combining ideas into experiences

After the first cycle of ideation, ideas were discussed within the brainstorm session to investigate possible combinations. During the second cycle, it was achieved to develop seperate ideas for each design vision, which lead to eventually three learning experience concepts.
For the first concept, ideas were combined that resulted in a experience over the time span of a whole currciculum that changed the current way of the Master. A learning scenario was created over the time span of two years. The second concept consists of a learning experience that included multiple courses, activities and events that supports the communication and confidence skills of designers. The third concept has its foundation in a high-intensity course focusing on collaboration over the duration of one semester.

At the end, **the experimentation started to combine the learning experiences into a coherent whole**: A new proposal for a new Master curriculum that aims to put focus on the three design visions translated into learning experiences. In this stage, the concepts formed the building blocks of the new Master experience.

5.1.3
Detailing aspects

To communicate the experiences clearly, make them more tangible and easier to validate, a detailed structure and overview of the Master was created where the underlying structure and relations between the concepts are drawn. Moreover, other current courses were researched from all Masters in order to discuss the possibilties within the concepts with the supervisory team. **The development of the structure opened up the opportunity to communicate ideas for learning activities and courses that were thought of during the first cycle.**

As each concept has a different focus and experience, the elaboration and detailing phase differs per concept. By elaborating and detailing, the whole envisioned Master experience becomes more tangible and the concepts are easier to imagine. Each learning experience concept includes ideas for the development of activities, courses or events, that were thought of in the first cycle. In the development of these activities, the learning of the student was globally taken into account with cycle of Kolb (1984).

5.1.4
Validation

In the last cycle, the whole new Master experience was presented to six Master students from IDE. First, the setup of the old curriculum was shown, followed by the proposal. All participants were stimulated to think out loud when they saw the setup. **It was important to investigate what was logical but also unexpected**. Last iterations are performed on the concepts and iterations for further development are defined.

At last, the Master set-up was discussed with the supervisiory team, two education experts and the dean of the faculty. They all gave feedback on the final learning experience concepts, which also resulted into recommendations for further iterations and development as well as the startingpoints towards the envisioned future and a learning experience.

05 5.2 A New Master experience

This paragraph presents the final design of this project first, followed by three learning experience concepts that all try to support design students in the most valuable learnings that can be offered by their education. In this way, the envisioned Master experience aims to inspire the Master innovation process at IDE.

Derived form the combination of the concepts developed, the Master experience puts focus on three focus areas. Figure 17 gives a representation of the envisioned Master, that also integrates parts of the design focus of this project. These concepts are experiences that guide students in the development of the skills and knowlegde needed as a designer, valuable within its education and after.

The designed Master learning experience aims to combine different insights of the future, insights from students and other parties. It aims to contribute as an envisioned future of the education of the designer and pays attention to the most valuable learning experiences .

In short, the new Master experience includes learning experiences that focus on the inidividual in the whole (1), creating reciprocal learning relations (2) and aims to increase the value of designers in multidisciplinary teams (3). Within the concepts, the first concept focuses on the individual learner, the second on building reciprocal relationships between a design practitioners and the third about the designer between multiple disciplines and collaborations. Detailing the experiences, that translate the most valuable areas to be developed (Chapter 3.4), is presented in the coming paragraphs.

1 STUDENTS AT THE FRONT OF THEIR EDUCATION

The first concept offers students the opportunity to take responsibilty in their learning, resulting in moments of achievement aiming for confidence building and more awareness of the individual value.

Eventhough we go to a world full of collaborations and the interdependency of others in our learnings, this experience aims to support design students to make their own decisions and find focus in the complexity of all the opportunities within education. The experience is developed over the timespan of the whole Master that starts off with a joint exploration with all Master students. After high-intense block courses at the start, moments of reflection during the whole Master supports the creation of moments of achievement. After the exploration, students choose their own specification courses based on the Master tracks (SPD, IPD, DfI). This way of starting gives students a way to explore and no limitation to the profession. Moreover, next to the mandatory courses that belong to the Master track, there is still room for elective courses to experiment with the different fields of design.

2 RECIPROCAL LEARNING

The second concept puts the experiences of the individual designers into a culture of reciprocal learning relationships. This experience involves learners that are both the educator and learner. This learning experience supports design students in learning how to communicate and translate the design process to others.

Learning with others puts a focus on sharing experiences that aims to create room for design students to discuss vulnerability and experience room as well as solution space to cope with the world of flux. A setting that puts design students, educators and professionals both in the classroom. The faculty and its employees become an equal learning partner of the design student.

3 INCREASING THE VALUE OF DESIGN IN TEAMS

Challenge-based learning experiences in the form of multidisciplinary projects with other faculties of the TU Delft are proposed in this experience, where all teammembers benefit from the knowledge gained through the collaboration and collaboration skills are educated.

Complex challenges ask for the collaboration between multiple disciplines, so also communicating the design process to non-designers becomes more important as the awareness of the benefits of design increases in multiple, maybe unexpected, industries. In a world where designers become part of big multidisciplinary teams, collaborations skills are of high value. Especially from designers who are traditionally the ones who can create an holistic view of stakeholders and simultanously think of creative solutions. This learning experience is especially supported by the second concept, where students are educated to communicate the design process clearly.

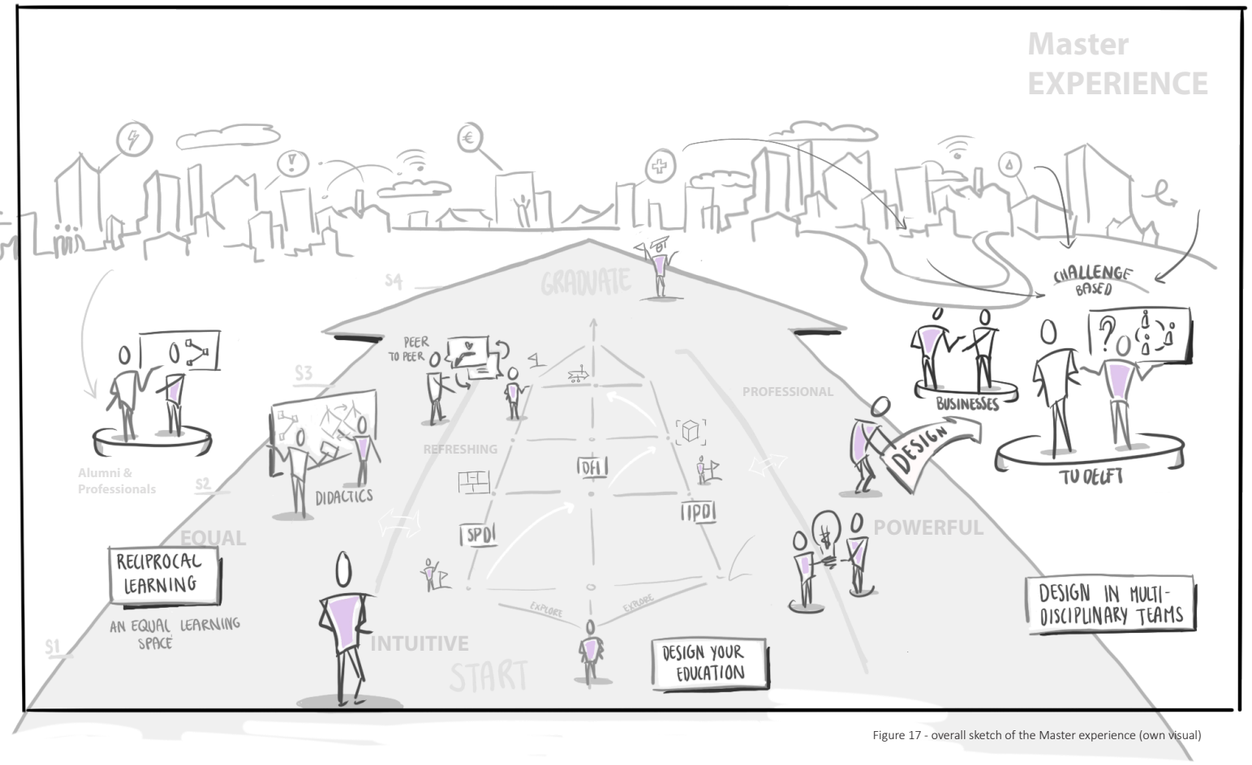


Figure 17 - overall sketch of the Master experience (own visual)

5.2.1
Overview of the structure

This section gives an overview of the structure within the overall Master experience including the concepts it is build on. As stated before, the final design consists of three different concepts, where each concept is a learning experience consisting of a different interaction between the IDE MSc student and its education.

In Figure 18, the structure of the IDE Master curriculum is visualized. The first concept guides as a continuous experience that is building further on the other concepts. Compared to the traditional structure, where there were three Masters with each its own journey, this experience combines all abilities of the Master. Based on the previous research conducted in the first diamond of this thesis, the role of the designer is increasing next to the interests of IDE students in mutliple skills beyond their own Master program. **From three specific Master programs and experiences, the designed Master experience proposes one Master with the Master programs integrated into tracks that consist of courses that are track-related. During the experience, moments of reflection are integrated that are crucial for giving the students a moment to breathe and reflect on their experience and learning goals**.

Over the time span of the Master, a continous experience is created consisting of activities and jobs that increases the communication skills of design student and helps the student to prepare guiding design in the outside world. To put everything into practice, challenge courses are integrated into the curriculum that consist of multi-disiciplinary teams. However, this experience includes an adaption curve where the first challenge project is conducted within IDE.

With this Master overview, a new Master experience is translated more into the setting of IDE. In the coming paragraphs, the concepts are discussed invidually based on the 'why, how, what' structure with a short recap of the design vision.
WHY refers to the reason behind the overall goal of the learning experience and the link to the world outside next to the role of the educator. **HOW** refers to the desired value exchange between a student and IDE within the experience qualties and mission statement. **WHAT** refers to detailing the whole experience consisting of ideas and the role of the educator that enhances the designed value exchange.

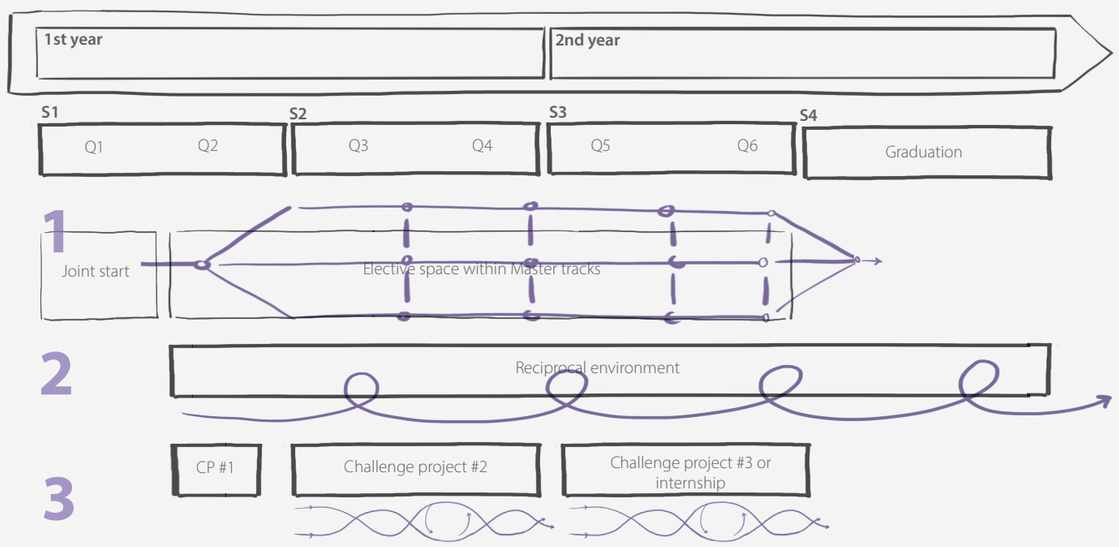


Figure 18 - Overview of the MSc. Structure (own visual)

#1

5.3
Design student at the front of its design edcuation

I want students to be able develop their own moments of achievement in the never-finished processes of life by supporting them in the development of a mindset that focuses on indiviual growth in the collective.

80/20 principle

Balancing
Attractive
Intiutive
Decisive

DESIGN VISION

WHY?

The first concept aims to respond to the changing learner behavior and the mentioned need of design students to broaden their view within the field of design. The developed learning experience proposes a transformation in design education that is focused on having a good learning process instead of grades, where there is room for focusing on the intuition of the design student. Moreover, as the well-being of students becomes more important, this experience aims to create room for reflection and focus on what is important for the individual. By providing students an experience that is less focused on grades, they will not be scared to do the things they feel is the best thing to do. The learning experience aims at providing self-directed, process-focused experiences where knowledge is built up on older experiences guided by the student itself instead of the educator or faculty. Moments of achievement are created by students themselves by integrating more moments of reflection and by letting them choose their path themselves supported by an initial exploration phase. Next to designing the elective courses, **educators** become personal mentors of students that help them in moving within the field of design education.

HOW?

The design vision is proposing a change in the perception of what has been previously defined as a DfI student, SPD student or IPD student. Moreover, the design vision aims to shift the perception of the fact that you are a good designer when you get high grades during the Master. In this way, IDE creates room for students to explore, stimulating students to become proactive in their own learnings by looking critical to what they think is needed.

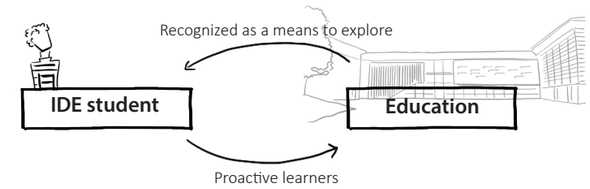


Figure 19 - Designed value exchange (1)

WHAT?

The first concept proposes a big change in the set-up of the current MSc. curriculum. It is aimed to support the exploration of the design Master student in the initial stages of the Master next to integrating more electives and a self-directed learning experience in order to bring the best designer out of the student.

Initial ideas for further development are presented. The ideas are mapped over the time span of the given concept and tries to involve all expertises of the traditional Masters. The graduation remains the same. The moments of reflection are curcial for the learning experience of students (Kolb, 1984).

Exploring the field of design - the individual journey of the design student.

Joint start consisting of 10 weeks:
Introduction (1)
Block course (2-7)
Field trips & Sprints (8-10)

Master tracks - Switching through the Masters

DfI Use & Experience, Visual communication Iteractive Technology Design
SPD Roadmapping, Strategy Building, Business model innovation, Branding principles, Financial viability course
IPD Modelling, Materials, Sustainability, Prototyping, Embodiment design
Overlapping: Research Methodologies, Projects (Concept 3) & Communicating the design process (Concept 2)

Moments of achievement - Quarterly two days to work on individual reflection

05

#2

5.4 Reciprocal learning

I want students to be able to understand the value of being vulnerable about their experiences by introducing them a new culture of reciprocal learning relationships between students, educators and others.

Like being with a life-long friend

Equal
Authentic
Supportive
Refreshing

DESIGN VISION

WHY?

As the world around us is changing rapidly, it becomes hard for universities to keep up with the transformations resulting in out-dated curricula. This learning experience integrates an environment of reciprocal relationships, like peer-to-peer learning, to stimulate the sharing of real-life, relevant experiences and the communication skills of students. It aims to prepare students to deal with the vulnerability of design and learning to position themselves as designers in the process dealing with its ups and downs.

This environment also implifies the opportunity of **educators** to share their insecurities and failures in order to let students learn from them and become an equal learning partner. The learning experience to be developed aims at providing trust to students but also win the trust back as a university that was lost over the previous years. This concept stimulates the development of the core competencies (chapter 3.4) 1, 4, 5.

HOW?

The design vision proposes a focus in the education of the designer on generating collective knowledge and understanding by sharing good and bad experiences where there is room to discuss failures and grow further. By providing students an interactive experience that is focused on equal involvement of all, IDE and its educators become an equal learning partner of the student that offers a safe but also refreshing environment. Students turn into active participants that are educated in the knowledge sharing of personal experiences as well as experiences as a designer.

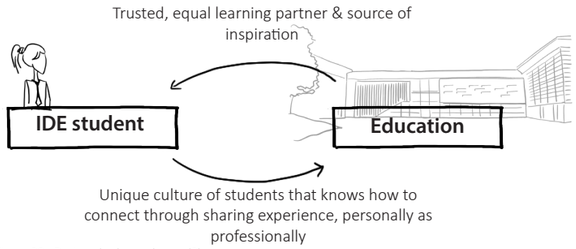


Figure 20 - Designed value exchange (2)

WHAT?

The learning experience of this concept includes an overall peer-to-peer learning experience over the time span of a whole Master that is divided into sharing experiences within design education and the world outside the faculty. The second concept proposes an interactive learning experience between design practitioners where sharing knowledge is the core to coping with collective and individual challenges. This learning experience is divided over two streams: professional and personal. The professional experience focuses on design didactics that is seen as a relevant skill for behaving in the working field. The personal experience focuses on sharing experiences between students in order to learn from other experiences and bring refreshing insights to someone else's challenges as a designer.

Using experiences to grow - A way to learn from others and what is going on in the field

Activities
Invite Alumni over (concept 1, reflection space)
Graduation sharing experience

Project / course based
Courses without an educator (concept 1, course space). Projects with designers from other faculties (concept 3).

Learning how to communicate the design process - design didactics

Within IDE
Design didactics for Bachelor students focusing on teaching the design cycle.

For outside IDE
Participation and development of a IDE Design Consultancy Lab combining with the development of online design courses of IDE for externals.

#3

5.4 Design in multidisciplinary teams

I want students to be recognized as both designer and teamplayer in complex challenges of the future that bridges everyone's ability to become a designer by empowering them to build a common language first that exploits the education of the designer beyond its profession.

Dynamics of a rugby team

Powerful
Diversive
Collaborative
Professional

DESIGN VISION

WHY?

The future work of the designer consists of collaborations with multiple disciplines. This learning experience aims to integrate challenge-based learning experiences into the Master journey of design students where they learn how to cope with different opinions and perspectives. This concept is supported by the skills gained from the other concepts, where tools and communication skills are applied in the dynamics of multidisciplinary teams. **Educators** become the facilitators of the experience, but also help to strengthen the relationships with the other disciplines within the team. Moreover, the development of these courses aims to increase the awareness of the value of design within teams and opens up to other faculties within the TU, increasing the role of IDE and improving projects like JIP. This concept aims to stimulate the development of all the core competencies (chapter 3.4). Design student become graduates that know how to collaborate with everyone, everywhere.

HOW?

This learning experience is focused on the interplay between team members, where design students learn from others, but also use the expertise of the other to realize designed ideas. This will bring teamwork to a higher level where design students learn how to collaborate with non-designers and going beyond their own profession as a teamplayer. In the education of the designer, IDE becomes an unlimited network for students consisting of many more students where design students are educated as the best collaborators that the future world needs.

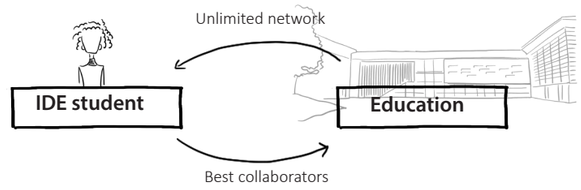


Figure 21 - Designed value exchange (3)

WHAT?

The last concept starts with the idea of challenge-courses next to the courses offered by the other learning experiences where students get the opportunity to put their learnings into use as a designer, translate the design process, learn how to realize ideas and use the abilities of others. To get students to know with the challenge courses, the first challenge, in the second quarter is only with IDE MSc. students. The courses include high involvement of companies, with a real-life challenge. However, in this case, students choose the area of the challenge first, followed by the creation of the team consisting of multiple students from other faculties.

For this learning experience concept, a learning experience is visualized with the aid of a service blueprint (Stickdorn & Schneider, 2011) a detailed form of the course is developed. In this way, the involvement of other students outside the IDE faculty was investigated and visualized in Appendix H.

Increasing the value of design in teams - putting knowledge into practice

CP #1	Challenge project #2	Challenge project #3 or internship
IDE SPD, DfI & IPD	**IDE & other faculties**	**IDE & other faculties**
Design Project, company involvement: combination of Strategy, Experience and Realization	Multidisciplinary, company involvement, challenge area given	Multidisciplinary, company involvement, challenge area not given, start-up building stimulated

05

5.6 Validation

The final design of this thesis shows how an outcome of the combination of the designed concepts for valuable learning experiences for design students. To test the Master experience proposal, with the concepts integrated, sessions were held with students, focusing on the desirability of the Master experience. In addition, to validate the feasibility of the experience, sessions were held with educators.

5.3.1 Student validation

Methodology
Four Master students of IDE participated in the validation phase. Of each Master program, participants were included in order to create a broad range of insights and input relevant for the current program. The session was conducted online, a combination of Zoom and Miro that helped to keep the interaction between designer and student. First, the students were asked about their experience of their current Master, followed by the questions to formulate three main challenges during their education. The students were asked to brainstorm for solutions for their challenges shortly and what they would expect from IDE. This was done to understand what kind of individual needs the specific Master student had.

Secondly, the participants were guided through the overall new Master experience next to the formulated mission statement, with their own challenges in mind.

The time span of the Master was discussed, while slightly integrating the learning experiences of the designed concepts., if possible, the explanation was personalized to the specific challenges and needs mentioned before by the participant. Subsequently, the details of the new Master setup were shown to give the participants a real-life indication of how the Master should look like. Moreover, to which extent the learning experiences concepts met the experience qualities before, the participants were asked to scale the qualities from 1-10 after seeing the concepts.

At last, it was tested to what extent the Master experience and the concepts reached the designed interaction vision. What feeling the participants felt when the experiences were explained in further detail and what they would add to increase that feeling.

INSIGHTS

Opportunities to learn
First of all, all participants were inspired by the new setup of the Master: "**Sometimes I feel like I want to learn more from the SPD course, to add some business perspectives to my ideas. This Master would open up that opportunity more.**" But also, saw a challenge in having more elective space as it could give them also too much freedom or time spend on courses that are dissapointing in the end: **"The elective space should be filled in effectively with courses that are really relevant for the future and focus more on the encounter of methods and tools that can be used in the challenge-courses.**" Furthermore the students understood the value of the skills gained in the learning experiences for entering in the outside world: **"I am really interested in teaching design, this is what I would like to have learned before my internship.**"

Feelings
Based on the discussed feelings and expectations, students recognized themselves in the described mission statements: **"I recognize myself in this mission statement as we always trust only ourselves as designers and are afraid that our ideas will be changed or critized."** Translated into the second concept: **"The second concept increases the feeling that it is okay to feel stressed during the design process. But right now, we are maybe to competitive at IDE."** Moreover, they were also aware of the value of designers as collaborators and the current situation of IDE: **"I recognize the value of designers in collaborations next to the fact that such experience not is really offered at our faculty, only JMP or JIP are the only options. So making this really part of our curriculum seems interesting to me."**

Overview
By discussing the underlying goals and structure of the Master, students stated: **"With this Master, IDE goes further than only designing, the Master is more interactive and at the same time offers also possibilities for personalization. As DfI student, I have the opportunity to also work with cool companies"** Moreover, the set-up, within the three concepts that give structure, gave students a clear overview: **"I like the division of the challenge courses next to the standard design courses, I see the second concept as a way to translate what you learned into the challenges."**

Specific insights on the concepts are formulated as iterations of further development in the next paragraph.

"Innovation of the future education of the designer will happen simultaneously, in collaboration between the educational and professional spheres."

5.3.2 Educator validation

Methodology
With the development of the future context and the proposal for a new Master experience, several statements can be made for IDE and the IDE student. Moreover, to validate the insipration as well as the feasibility of the learning experience concepts integrated in a new set-up for the traditional Master program, two educators from IDE and the Dean of IDE were asked to be interviewed.

Insights gathered during these validation sessions, next to the feedback of the supervisory team, are structured according to the different deliverables. The insights gained from the educators, are seen as a way to formulate concrete starting points for steps that need to be conducted for realizing such experience and evaluate the feasibility of the final designs.

INSIGHTS

Future context of the education of the designer
AS A MEANS TO INSPIRE & EXPLORE
The developed future context visualized in the developed framework in Chapter 3.4, was discussed multiple times during regular check-in moments with the supervisory team and other educators of IDE. The main goal of these discussions was to validate wheter both team and other educators saw value as well as understand the proposed future context with its methodology. By taking the educators through the development of the initial assignment first, followed by the conducted design steps, the framework was presented, without saying the design focus. In the end, educators were asked to give feedback on the framework.

Overall, it can be concluded that the educators got inspired by the framework and saw the clear difference between the nine orginated behaviors. **"I really see the combinations made by the framework resulting in the behaviors, focusing on the needs of the student."** Moreover, it was said that: **"This really indicates the voice of the student, instead of what the world outside is saying us what to do."** However, they would have liked to see more clearly the role of the educator in the practices in the design visions as well. Furthermore, the educators agreed on the focus on preparing designers to the outside world better by offering learning experiences focusing on the development of skills that are of high value, like collaborating with multiple disciplines.

The new Master experience
AS A MEANS TO IMAGINE
The new Master experience was presented next to the current set-up of the Master progam over the time span of two years. The three concepts of the new Master experience were discussed. Educators were asked again if they would imagine such experience that could guide as a new set-up for an IDE Master and contribute to the Master innovation process. "**We are indeed looking in opportunities to combine the Masters.**" Moreover, **"I really see value in the didacts of design, pay attention that should not be misunderstood by the term 'communicating design' as that is now perceived as the definition of design at IDE, not the communication of the process."**

During the interviews, the educators also highlighted the difficulty of implementing new plans in the educational sector: **"When we want to innovate something, it takes years for realizing new stuff, so take that in mind."** Furthermore, the sessions conducted with students and educators are too limited to fully iterate on the proposed Master experience. For the future, more sessions should be held to really investigate the desirability as increasing the feasibility of the Master proposal. Moreover, it was also adviced to look at the external communication from IDE towards the world outside and next generations of students to enhance the developed concepts.

Learning experience concepts
AS A MEANS TO BUILD UPON & INSPIRE
Just like discussing the whole Master experience, a lot of new ideas and insights resulted from the discussions about the learning experience. The scenarios were presented and the educators were eventually asked to tell their ideas about the concepts. Overall, the transition from the mission statements towards the ideas was quite clear: **"I really see the need of the student translated into the experiences."** However, the educators were also quite critical: **"I do not experience the distance you describe between the Masters, starting of together does not seem the right solution to me immediately."** Talking about the core competencies of design, educators were aware of the struggles with the communication of the process as well as the definition of the different roles and job discriptions after graduation.

This paragraph forms the last stage of the development phase. The validation sessions resulted into input for iterations for the developed Master experience and concepts. In addition, the feedback was used in the next stage of this thesis, the delivery phase. The delivery includes the designed road towards the future, including a recommendation for the positioning of IDE that fits the new Master experience and its offerings.

06

A plan for implementation

This chapter describes a possible road to the envisioned Master. First a future positioning based on the developed experience is given followed by the input for future development resulting in an implementation roadmap.

06 6.1 A future positioning for IDE

Eventhouh the future positioning of IDE is already of high topic within the organization of IDE. This thesis aims to porpose a value proposition for IDE that fit the imagined futrue learning experiences. Moreover, this positioning is also used in the roadmap to be developed in Paragraph 6.3.

The future positioning is visualzed in Figure 21. The external communication is based on the values derived from the practices (Chapter 3.3), design visions (Chapter 04) including the experiences developed in this project (Chapter 5.2). Together with two SPD students the interaction visions and design were discussed during a brainstorm about value proposition statements. This brainstorm resulted into the visalization of the visual next, and future positioning statements were developed based on the three design visions.

IDE AS A MEANS TO EXPLORE & INSPIRE

All learning experiences combined, IDE position itself towards students as a means to explore within the field of design and beyond.

IDE AS A LEADER IN DESIGN EDUCATIONBY BEING A CONNECTOR IN THE FIELD

IDE connects designers to designers, designers with professionals to students, and design students to other disciplines and increase the value of design coping with the complexity and challenges of future world.

IDE AS THE DELIVERER OF BEST COLLABORATIVE DESIGNERS

With the new learning experiences, designers are educated to collaborate with multiple disciplines in mind, knowing how to translate the design process and turn the abilities of non-designer into valuable input for the process.

"Delivering graduates that know how to position themselves in the complex world and collaborations."

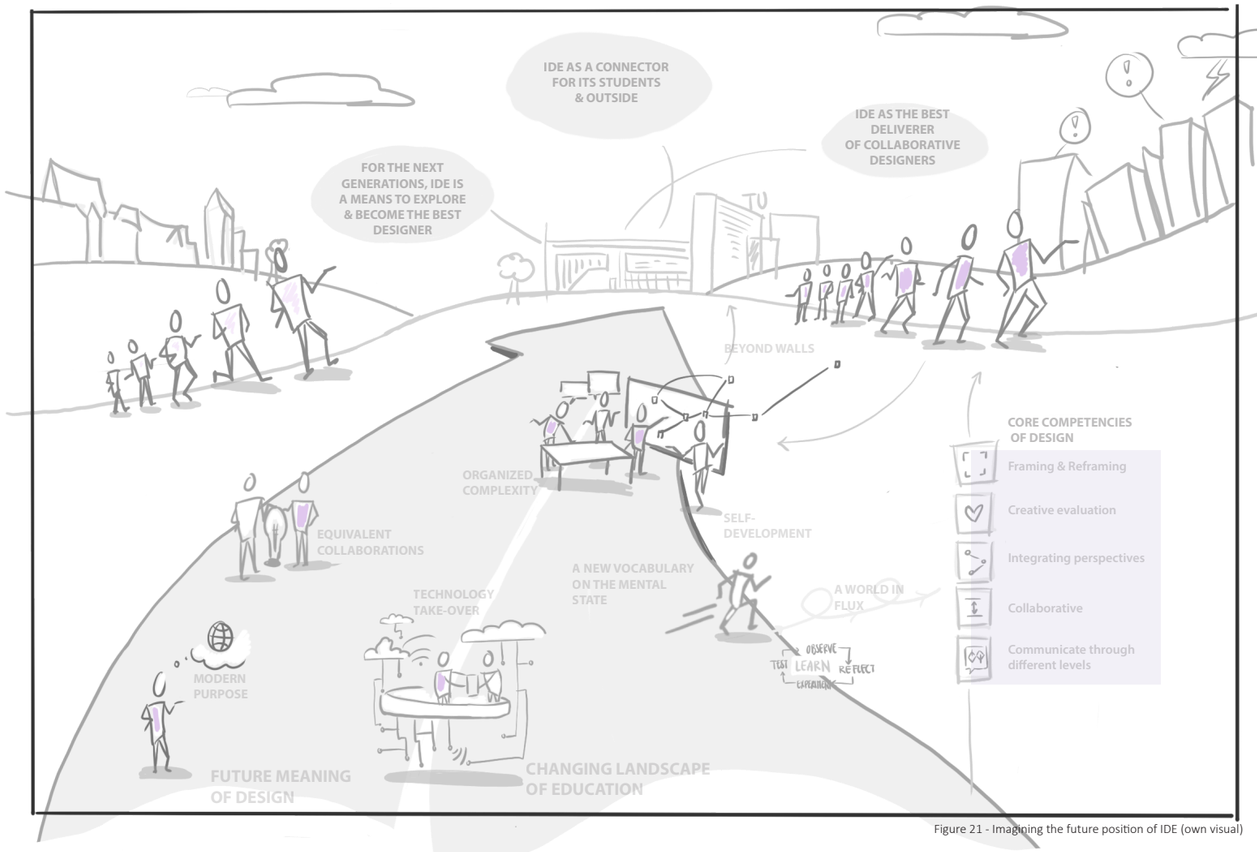


Figure 21 - Imagining the future position of IDE (own visual)

06

6.2 Input for development

This paragraph discusses the main challenges per concept that supported the development of a roadmap that aims to bring a lot of the conducted research together. Setting up a new Master contains a lot of further elaboration and development. To further develop the Master, more iterations, discussions and co-creation sessions are recommended. Yet, validating the imagined experience provided many more insights and challenges. This ensured the formulation for initial iterations.

#1 THE CHALLENGE OF MIXING MasterS

Help students to make decisions
Eventhough, this learning experience aims to help students to be decisive and trust on their own intuition, they still can feel lost. Next to the moments of reflection, connect students with educators as Mentor. The role of the Mentor can be introduced at the start and guide as a source of advice. Also investigate opportunities more to also attend courses of other universities, do an internship or go abroad.

Unclear definition of design
Research the definitions of design further, create a clear understanding for involved companies during the collaborations, show they know what to expect and what to kind of talent to look for.

Help students to formulate the definition of design during the moments of reflection. Now we only have Manage Your Master and Strategic Value Design that play a role in this, or the course Manual. More attention should be given to the definition of the competencies of the design student.

Mixing educators & fields of research
Just like that collaborations between student are not always joyful and inspring, this goes the same for educators who have each their own expertise. Explore and define tools for better collaborations between the educators and fields of research. This will be one of the biggest challenges in the internal organization.

Relevant digital tools & technologies
As technologies evolves way quicker, the education of the designer should educate them how to adapt faster. Explore ways to stimulate design students to educate themselves with the newest technologies and tools, e.g. online courses and offer free-subscriptions to work with them.

#2 CREATE RELEVANT RECIPROCAL RELATIONS

Peer-to-peer
Investigate what kind of peer-to-peer learning suits best with the given learning experience.

Alumni Network
Explore opportunities to invite Alumni more, besides the LinkedIn page, to the faculty to share their experiences.

Involve Alumni more in the Innovation of the educational programs of IDE in order to focus on the student experience more.

Competitive vs. Collaborative
Explore ways to have ambitious designers. Organize events, increase the awareness of design competitions outside the faculty, not within.

The role of the educator
Be aware of the role of the educator when implementing more peer-to-peer experiences. Moreover, investigate ways to educate educators also.

#3 COLLABORATIONS WITH NON-DESIGNERS

Collaborating with other faculties
Make collaborations with designers more attractive by exploring ways to increase the awareness of the value of designers in teams of students.

Investigate ways to strengthen internal relationships with other faculties.

Eventhough, projects like the Joint Multidisciplinary Project (JIP) are focused on the collaborations between disciplines, however the role of designers in these projects are limited. Explore how and who to involve more in these projects in order to update the current program.

Persuade companies to involve students more
Investigate ways to attract new companies and increase the network that is also attractive for the TU Delft.

Create together with students introduction sessions for other faculties before the start of each project about the value of design and the process of design thinking.

Prepare students first & increase awareness
Explore the main challenges design students will face.

ROADMAP DEVELOPMENT

As experienced during this project and the development of ideas within the educational sector, innovating in the educational area is difficult and time-consuming. The iterations derived from the validation sessions were used to build a road towards the imagined Master experience. **A roadmap is designed to explain the steps to realize the Master experience and underlines the difficulty and complexity of the subject.** The roadmap is presented in the next paragraph.

By categorzing the potential iterations, starting points for developing the Master are thought of that highlight the most important activities of IDE in the development to, eventually, keep its position as a leader in design education. **The main starting points are communicated in the roadmap as the Three Horizons that form the basis of the Roadmap.**
In the roadmap, activities for the development of the learning experiences as well as combining them are formulated. Below of the roadmap, the driving forces are also formulated, to bring the research and result together near the end of this thesis.

Horizon 1
STRENGTHEN RELATIONSHIP & PREPARE

The first horizon focuses on strengthen internally the relationship between the student and its education by starting to integrate concept 2 already with small parts. Simultaneously, it is recommended to investigate the needs of students when combining the traditional Master programs: What would they like to learn from the other programs now?

Furthermore, for the setup of the collaborations, the horizon focuses on investing ways to increase the awareness of design in multidisciplinary teams externally.

Horizon 2
EXPERIMENT WITHIN & EXPAND NETWORK

The second horizon involves experimenting with the combination of Master progams into tracks and offer students a more self-directed experience. However, this does not mean that the setup is integrated gradually, the first two horizons are mostly experimenting and developing.

Further more, setting up collaborations with other faculties, designing the potential challenge courses are done in this horizon.

Horizon 3
GOING OUTSIDE & IMPLEMENT

The third horizon is the stage where the implementation and planning of the new Master experience can start. It forms the start for IDE to put their designers beyond their own proffession by offering them more self-directed and collaborative experiences also outside the faculty.

At the same time, the faculty ensures that their design students become prepared for the challenge courses as well the world after graduation by offering them the communication and collaboration skills they need that also ensure a life-long learning attitude.

2021 | 2023 | 2028

1 STRENGTHEN RELATIONSHIP & PREPARE

2 EXPERIMENT WITHIN & EXPAND NETWORK

3 GOING OUTSIDE & IMPLEMENT

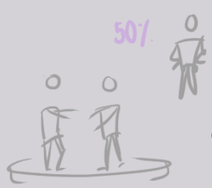
Activities

STUDENTS' LEARNING EXPERIENCE

DESIGNER OF OWN DESIGN EDUCATION

RECIPROCAL LEARNING

DESIGN IN MULTI-DISCIPLINARY TEAMS



Current setup of the IDE Masters

Create sharing spaces

Increase awareness of design in multidisciplinary teams

Experimentation of shared mandatory courses

Involving Alumni & create didactic courses

Set first agreement & challenge ideas

Design own curriculum within IDE

Reciprocal environment between design practitioners

Multidisciplinary courses with three faculties within TU

Activities

IDE

INTEGRATION

#1	#2	#3
Explore needs of students & outside	Decrease competitive vibe	Set a definition of the role of an IDE designer
Developing setup of tracks & joint start	Strengthen relations with Alumni & companies	Strengten collaborations internally with TU faculties
Offer students the explorations in the field of design	Teaching & sharing in the skill set of designers	Put into use and going beyond the design profession

EDUCATOR

Knowlegde transfer → Facilitator → Collaborator & Mentor

POSITIONING MSc.

A way to expand their design discipline

A way to explore the field of design and beyond

Designers as the key players in complex challenges

EXTERNAL

TU DELFT

Exploring opportunities to collaborate in courses more within the TU (JMP, JIP)

Upgrading JIP, setting up new ones that stimulate collaboration

Projects with students from other faculties in the Netherlands

COMPANIES

Increasing awareness of design

Strengthen relationships with universities

Highly involved stakeholder in student projects

ALUMNI

Involving Alumni more after graduating for real-life perspectives

A big source for innovating the education of the designer

Alumni as connector of the business & involved in projects

TRENDS

PEOPLE	The Modern Purpose: Increasing awareness world problems	A New Vocabulary on the Mental state: Focus on well-being	Ongoing self-development: Personalized learning	A World in Flux: Bundeling strengths in communities	Constantly adapting	Equivalent Collaborations: Ultimate equality
ORGANIZATION		Organized Complexity: Stakeholder management	Complex services	Never ending customer	'Daily' businessmodel innovation	Everyone connected
TECHNOLOGY	Technology Take-over: Digital prototyping	Cloud-based colalborating	3D/4D printing	Artificial intelligence for increasing efficiency	Beyond Walls: Crowdsourcing	AR & VR for collaborations

IDE AS A MEANS TO EXPLORE & INSPIRE

IDE AS THE DELIVERER OF BEST COLLABORATIVE DESIGNERS

IDE AS A LEADER IN DESIGN EDUCATIONBY BEING A CONNECTOR IN THE FIELD

A LEADER IN DESIGN EDUCATION

6.4
Final Recommendations

To conclude the delivery phase of this thesis, this chapter includes final recommendations for the faculty towards the future of the education of the designer. It includes overall recommendations that are formed during the whole process next to additional learnings derived from the field research. These recommendations can be perceived as points to take into account.

This project defined the most valuable learning experiences that future designers will need. The first two final reommendations highlights these experiences and its purpose. Design thinking is maturing, moving towards an established practice.

Focus on translating the HOW of design instead of the WHAT and WHY.
Currently, courses at IDE stimulates students to think in a philosophical way about what they offer companies and organizations as an individual designer, that includes the formulation of what their interests are and their believes in design. However, the 'how' , its communication and real-life translation is still vague and experienced as a challenge. This is a pity, as the tools and methods IDE offers its students are of high value and should not be easily forgotten. It is recommended to put the promising words of the designers more into practice that includes the communication of the design process and the ability to combine different tools and methods that fit the given challenge.

The definition of the designer in the professional field
The increasing establishment of design thinking increases the debate among people about the definition and values of design.

Based on the interviews among Alumni and companies, multiple job descriptions for professional designers are used. It appeared that companies do not fully understand the core definition of a designer. At the faculty, ongoing activities that include the formulation of the capacities of the designer from IDE itself (2019) and Conley (2011), focus on what the designer can do. In the descriptions, we have UX designers, Service designers, UI, Product designers. It is recommended to the faculty to look at the job descriptions outside, create courses and learning activities that already can give a glance of such professional descriptions. In the education of IDE, there could be more opportunities regarding improving the definition of the designer in the form of research, events and external communication towards companies that want to hire designers. More qualitative research will be needed in this area.

Open up the IDE bubble
Professional designers like to share their insights of projects. Design thinking is used in the professional area in creative activities that foster collaboration and solve complex problems in a human-centered way.

In order to increase the collaboration skills of the design student learn students to become creative collaborators, the TU Delft can improve its education by connecting faculties more in the curricula in forms of collaboration. For IDE, this means opening up the bubble towards other faculties. However, the value of design in teams has to be communicated first, towards the other faculties an how design can help in delivering sustainable solutions for complex challenges. This thesis shows the relevancy of collaborations for design students towards the outside world as well as the increasing awareness of the benefits of design thinking.

Moreover, by looking beyond the design disciplines, IDE becomes more a life-preparing partner that supports them in the journey searching how the abilities of the individual fits in the outside world, consisting of different challenges and people. When offering more valuable learning experiences, IDE stays a leader in design education by also focusing on the social skills of the designer that increases the value and translation of design. Increasing the role within JIP is recommended as a first starting point for the development of more intersting projects for both designers and others. In this way, designers are able to work everywhere, with everyone.

Last additions to the Manifesto
As last recommendations, additions to the current Manifesto are made and formulated on the next page. It also focuses on the well-being and individual of the design student, their translation and collaboration skills in the collective.

Experiment
To conclude the recommendations, this thesis highlighted the fast changing world next to the slower innovation process of education. It is recommended to look for the right driver that speeds up this innovation process and use the strengths of designers in their own education. Use design to experiment in its own education, just like this project.

The world outside evolves fast, and we have the need to adapt faster.

#1
IDE designers know how to disarm complexity by having a mindset that guide them in what is important for both team and themselves. Designers know how to choose the way that that brings the best designer out of them.

#2
IDE designers are not afraid of fast changes. They lead the way in this ever changing world with creative confidence and sharing their knowledge to others to build up on multiple experiences. They are able to guide others in the vagueness of complexity by being a guide and leader in the design process

#3
IDE designers will drive change in technology-driven environments by using the designer mindset in connecting every unique ambition needed to realize digital services and products. They know how to be a team player in multidisciplinary teams and use and learn from everyone's ability as something valuable in the design process. They are the ones who knows how to work with everyone, everywhere.

07

Conclusions

This chapter forms the conclusion of this Master thesis where the final design is evaluated and a personal reflection ends the project.

07 7.1 Conclusion

This project aims to contribute to the Master Innovation of IDE by investigating and defining most valuable learning experiences. Through student-centered design, investigation of future behaviors that resulted into desired relationships between IDE students and its education formed big parts of the process. The following can be concluded in relation to the main research question stated in this Master thesis.

Initial research showed, caused by the digitizing world and increasing complex challenges, big changes are observed in the role of designers as well as the change in the dynamics of peoples life and their learning behavior. Being the deliverer of innovative designers, IDE is looking for ways to keep their education for students relevant and stay a leader in design education. The initial assignment of this thesis is to look at new, inspiring learning experiences that fit both future settings of design and education influenced by the digital world that are interesting for the Master.

The discover phase of this project included both current and future exploration that resulted into the final research question and the development of a two-dimensional framework representing future behaviors of IDE students. Based on research of the current situation done with informal interviews among students, IDE educators, Alumni and companies, an increasing gap is experienced between a designer's education and the job activities to be done after graduation. This gap causes feelings of insecurity towards the future, lack of preparation and a loose of trust in their education among design students. Moreover, the exploration phase resulted in more additional learnings for the faculty including the definition of design and the well-being of students.

Next to the current exploration, the steps of the ViP approach of Hekkert and van Dijk (2011), the future was explored resulting in a two-dimensional framework that combines both future meanings of design and education. With the framework design directions were discovered. Nine practices uncovered the future needs of IDE students.

Comparing current and future insights and the core competencies of design, the framework was used to define the design focus in this thesis that included the design boundaries and design statements.

Following the design focus, three future practices from the framework were chosen for further development that resulted into three different design statements followed by three concepts with different learning experiences. Within the statements, interaction visions were developed in order to define a desired, future interaction between an IDE student and its education.

The method in this thesis is focused on not only developing learning experiences that are student-centered but also on the way how education is delivered towards IDE students and what kind of relationship is needed to educate them. As perceived from the exploration phase, students take more responsibility in their own education and it becomes important for IDE to act as a trusted, but enriching partner towards students.

The design focus forms the initial answer of the research question stated in this thesis. The three chosen directions guided as starting points for concepts as the most valuable learning experiences for designers in the coming future. A combination of the three ensured the development of a final proposal for a whole new Master experience for IDE compared to the current Master program. **The new Master experience is more focused on both collaborative and self-directed learning with more attention to the self-development as designer and learning how to cope with other disciplines within unexpected situations. With this Master, it is aimed to open up the IDE bubble and focus on the type of knowledge designers definitely will need after graduation; being collaborative designers by connecting different values of people and translate them into meaningful designs and collaborations. IDE will be a reflection of the world outside in an educational setting, a connector between students and their real-life challenges as design professional after graduation. For design students, IDE becomes a means to explore the broadening field of design.** Moreover, the ideas within the final design tries to translate the core competencies developed by the faculty into real learning activities and contribute to the research before on the communication as well as the translation of teaching of these competencies.

As the implementation of a new educational experience involves many stakeholders, many opinions that increases the difficulty of implementation. That is also the reason why a roadmap is made towards the desired Master experiences that includes also external communication of the faculty and organizational steps.

7.1.1 Design evaluation

During the validation , educators of IDE confirmed that both the concepts and the overall proposal for a new Master experience next to the developed framework can be used as a means for inspiration and input for the Master innovation at IDE, that increases the feasibility of the final concept.

All interviewed participants that are involved in the field of design and/or education confirmed the value of the need for looking at new learning opportunities based on the changing dynamics within society. Both Alumni and educators confirmed the need to support collaborations between designers and non-designers more in the education to prepare students better to the world outside the faculty and focus on the skills that cannot be taken over by technology.

Moreover, strengthening collaborations between faculties and businesses will also be beneficial for the faculty that could strengthen their positioning in the field of design education by already connecting designers to the world outside. The first validations show that the new Master experience has potential to decrease the gap between the education of the designer and the job market as it already makes them more aware of how to collaborate with non-designerly thinking people.

Above all, the proposal for IDE MSc. Master is desirable, as the new setup is based on the concepts that are built upon extensive user research, that include all stakeholders, matching the needs and behaviors of futures. As the education of the designer will be more challenging and, in this way, more attractive for new generations of design students, the concepts are build to be used on the longer term where individual development, communication and collaboration are skills that will be and will increase of high importance outside the faculty.

During the innovation process of the Master, it would be valuable for IDE to look into more opportunities to make multidisciplinary challenges for design students, as the role of IDE within similar projects like JIP are limited. Next to this, educate design students how to connect other people through the design process becomes more important when working with the complexity of to be developed services and systems including many stakeholders. During the Master, there is already some attention to the communication of the individual designer, but the awareness of the value of designers within teams can be increased by communicating the value of the process more. In this case, assessment and evaluation of learning will change and it will be necessary for IDE to look into this. New ways of assessment will need new ways of how to measure the progress of a student's learning, what in the future will become more a responsibility of the student itself. Moreover, the role of the educator should not be forgotten.

To conclude this evaluation and conclusion, it should be mentioned that innovation in the educational field is something time consuming and multiple fields have to be taken into account. The development of a whole Master includes many iterations in courses and organizational structures. However, continuous innovation is necessary for IDE to realize growth, remain a leader in design education and stay interesting for future generations of designers and companies.

07

7.2 Limitations

Before the final recommendations are proposed, limitations of this project are formulated first that should be taken into account for this research project are described in this section.

As stated in the introduction, due to the lockdowns of the Dutch government to reduce the spread of the **COVID-19**, the qualitative research was conducted fully online. The qualitative interviews were conducted via video calling, which comes close to having a face-to-face conversation, there were yet some limitations. Although the conduction of online interviews was more efficient than meeting in person, real-life conversations could be perceived as more inspiring and safer when thoughts are shared and deep questions are asked. Moreover, participants could be less focused. Moreover, it increased the difficulty to conduct more external validation with professional design practitioners. An option is to set up a group of students, design practitioners and educators together that are willing to co-create new Master courses and experiences.

Also, as an effect of COVID-19, the well-being of all interviewed parties that include the educators, students, the mental well-being and its awareness gained a lot of attention in this period, especially relating to the situation of the online learning environments. All had to work or study at home as the TU Delft limited physical attendance at the faculties. This caused both overworked educators and depressing students, especially at IDE where they used to have a lot of in person meetings and education. Current students at IDE could have shared an experience with lower quality and more depressing moments, which could have a negative effect on the outcomes of the explorative research and a too much focus on the well-being of students.

Another limitation of this research was that, caused by the background of being an **SPD graduate student**, more experiences from the other Masters within and outside IDE through qualitative research could have been more enriching. Especially for the final proposal that blends all three Masters. Although first validations with students of all three Masters confirmed the desirability and potential increase of a more work-related environment that involves different minds, more qualitative research into the experience and values of the other Masters, and also other faculties, is advised for further development.

Finally, some limitations are described for all concepts as for the Master proposal that was developed. Due to time constraints and the focus on the experience of education, it was not possible to fully deep dive into the complexity of **the organizational structure within IDE of setting up a new course or eventually, a new Master plan**. This also includes involving other faculties into the curriculum more. The learning journeys and scenarios that are worked out are representative to describe the basis and learning principles of the concepts, as well the Master proposal. Currently, only the scenarios are worked out into some ideas for new courses as a minimum viable product, that could be an inspiration or addition towards developments of new ones.

Despite conducting research on new, interesting learning methods and future roles of designers, the knowledge generated for setting up new courses with relevant knowledge content may still not be enough. This is also why, as mentioned in the recommendations, iterations within the organizational structure of IDE are recommended to further develop and enrich the Master innovation. This can include more professional design practitioners, more technology people and people from other faculties that could enhance the connection between faculties. However, this is easier said than done and a mindset change will be needed.

7.3 Personal reflection

To end this Master thesis, a reflection is given on the process and methods used during this research. I would like to elaborate on my personal ambitions as reflecting on my personal journey as the designer in this project.

Designing for design education at IDE

Designing for the education of IDE was quite an interesting project where I was able to combine my experiences as a design teaching assistant, IDE student and graduate. A challenge for me in this project was to stay observative to create an academic research outcome and do not let my own opinions and ambitions influence the results in this thesis. However, the personal ambition and opinions ensured good discussions and guided as a main driver in difficult moments.

Before I started, I was aware that many people would have an opinion about what could be improved when talking about education. Everyone I interviewed came with multiple points of improvement, strong beliefs and perspectives. Besides this, the subject triggered a lot of people to be interviewed in the first place, which resulted into inspiring conversations with people who are highly involved in the education at the TU Delft. I really liked to hear the different perspectives of experts, educators, students, alumni and companies. It also ensured the challenge to connect, categorize and combine the insights where eventually I aimed to find a focus to design for. My passion for sharing and teaching the value design has grown further to the ambition to always look new ways how to communicate the design process. Moreover, I may want come back at the faculty in a later stage in life as a design tutor.

For the future, I am curious how the skills I gained can be used in the corporate settings as design becomes more relevant in multiple industries. I am eager to use my knowledge about design education in introducing people to design who are not familiar with it. When thinking about the working on the innovation of the Master further, I would integrate more design practitioners (or not) of corporate settings in co-creation sessions to gain their insights and align more with the world outside IDE.

The use of ViP

During the project, I wanted to learn how to work with approaches that were not familiar to me. The ViP approach was totally new for me. The steps of the approach, understanding them and communicate it in a report was quite a challenge. The ViP approach combining with the Double Diamond and a strategic mindset belonged to this challenge. As a first-time user of the ViP method, it started with a lot of chaotic moments as the steps were not the ones I usually took as a strategic designer. Talking with Matthijs really helped me to embrace the approach while I was struggling with the vagueness that I experienced in the first place. Where I was used to keep structure and clear goals in mind, this approach challenges me to do not, and stay open for new ideas. However, once fully dived into the approach and seeing the development of the results, I became aware of the value of ViP in strategic design. The ViP method ensured room for imagination and creativity that resulted into interesting outcomes and for me, a new way of researching future needs and behaviors of users. I have learned that I have a big imaginative mind and a big interest in the future. For me, the steps of ViP helped me to combine important aspects of the future meaning of design as well as future settings of education. I feel these interaction visions can be very interesting for strategic designers in developing a future vision as well as new services and experiences that fit future consumer needs.

I learned a lot about myself as a designer, I learned that I have an analytical and systematic mindset especially when doing exploratory research. I am able to deconstruct a topic, explore the context broadly and extract insights. I always aim to dive really deep into subjects and discover multiple opportunities, however, at some points decisions has to be made where to go. I found it hard to make the decision of letting go of interesting information. With the aid of my team, I have learned to make important design decisions, look for the relevance and use the benefits of my analytical skills.

As I was new to the approach as well doing research on my own, I learned a lot about the importance of asking for help of others within and outside IDE. This was also one of the points mentioned in the concepts of this thesis. I recognized, also by myself, that a lot of designers want to do things on their own, which sometimes result in moments of stress or insecurity. We become afraid to show our work, ask for feedback and grow further. During this project I learned how to do this where I became more confident in my work and how we may can improve our design education. Quick informal conversations with my team, having weekly meetings which I prepared with questions really helped me to make progress. Also talking to other students and helping others can give inspiration, I learned about myself that I am good at helping others, however, a balance in this is needed as your own project is also important. But most important, I have learned that I am able to work independently, manage a project by myself where I know how to ask the right questions to stakeholders and during interviews to bring the design progress further.

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07

Being flexible & trust

Moreover, I initially expected to do my research in the form of co-creation workshops in both beginning and near the end of my project. However, due to the COVID-19 situation, most of my research included online interviews and meetings. I get the most energy from working with people in person, where most of the time small brainstorm sessions and sprints ensure enthusiasm and inspiration. Moving online was a bit of a challenge for me, as it also caused feelings of less creativity and less motivation. Having started the project with a relatively open brief, it quickly turned out that the given initial assignment and context had many people involved, which can be even bigger than discussed in this thesis. Getting to know and managing all these stakeholders and their expectations from behind my desk was not always easy. Nevertheless, it has taught me to become more flexible, aware of the risks of working at home and how to become more creative in keeping a positive working vibe. The intensity of the graduation project next to the COVID-19 situation made me aware of my own resilience and always looking at the bright side during difficult times.

Graduating puts you in vulnerable positions, but challenges you to bring the best out of you. To conclude this reflection, the project has taught me to trust on the process of design. To future graduate students, I would like to say: trust on yourself, dare to ask the stupid and good questions, believe in your abilities and ambition and, as is said many times, trust the process of designing. Graduation is a journey full of hurdles, but in the end you will get there.

After this thesis, my ambition to spread the value of design has increased more than ever.

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APPENDIX

A.List of competition
B. Interview guides
C.Interview Insights
D. Factor Collection
E. Driving Forces of the Future
F. Practice formulation
G Addition to concept 3
I.Project brief approved

TU Delft

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Bente Willinge Gratama
Strategic Product Design