APPENDIX

TU Delft

Master thesis 2021
Bente Willinge Gratama
Strategic Product Design

A
List of competition

The list of competitors listed below are based on previous research conducted by the faculty itself (van Eijk, 2019) added with personal analysis of Masters that are related to all the three masters offered by IDE. For each University is was analysed what their mainly focus is in the education of the designer, and, if available, the why.
(E) = Exchange partner of IDE
(C) =

NL

- TU Eindhoven (E)

MSc Industrial Design (2 yrs) – self-directed learning experiences

- Utwente (E)

MSc Industrial Design Engineering (2yrs) – self-directed, 3 tracks available

- NHL Leeuwarden (C)

Master Design Driven Innovation (1yrs) – open innovation spaces, challenge-based learning

- HKU Utrecht (C)

Crossover Creativity (1yrs) – collaborative experiences, problem-based learning

EU

- Aalto Helsinki (E/C)

-Master's Programme in Collaborative and Industrial Design (2yrs) – international
-Master's Programme in Contemporary Design (2yrs) – studio -based, collaborative
-Master's Programme in Fashion, Clothing and Textile Design (2yrs) – specialization in design
-Master's Programme in Creative Sustainability (2yrs) – interdisciplinary
-Master's Programme in International Design Business Management (2yrs) – interdisciplinary, international

- Politecnico di Milano (E/C)

-MSc Integrated Product Design (2yrs) – interdisciplinary, working with students all over the world
-MSc Product Service System Design (2yrs) – system, holistic learning experiences, going beyond the
Discipline, challenge based learning
-Master Communication Design (2yrs) – specific on branding design, case based learning
-MSc Design Engineering (2yrs) – self-directed learning
+ many specializing masters of 1 year (among others):
-Lighting Design and Led Technology, Brand Extension, Furniture Design, Industrial Design for Architecture, Design for Kids & Toys (Online Master together with a company), Industrial Design Engineering & Innova-tion, Strategic Design, Service Design, Design for food, Premium design management, User experience psy-chology (joint master with Università Cattolica del Sacro Cuore), Product service system design for healthcare

- Umea Sweden (E/C)

-Advanced Product Design (2yr) – challenge based learning
-Interaction Design (2yr) – technology driven
-Transportation Design (2 yr) - case based learning

- Loughborough (E/C)

-MSc Ergonomics and Human Factors (1yr) - using a lot of industry people for learning
-MSc Integrated Industrial Design (1yr) - x
-MA User Experience Design (1yr) – x
-MA Human Factors and Ergonomics for Patient Safety (part time, 1 yr) - learn from industry speakers
-MA Occupational Health and Safety Management (part time) – learn from industry speakers

- RCA & Imperial College

-Design Engineering (MEng) (2yr) - making
-Innovation Design Engineering (MA/MSc) – SPD achtig
-Global Innovation Design (MA/MSc) – transnational

Non-EU

- Carnegie Mellon (E/C)

-MDes Design for Interactions (2yr) – multidisciplinary, technology and design

- MIT

-Master Integrated Design and Management DfI, graduate program the same as IDE

- Parsons (C) – problem-based learning, collaborative settings

-MFA Design & Technology
-MA Design Studies
-MFA Industrial Design
-MPS Communication Design

Examples from non-academic education

– offer flexible ways to update skills and stay relevant

- IxDA
- Singularity University
- THNK
- Kaospilot
- McKinsey Academy
- Koos Service Design Academy
- Livework Academy
- BMI Academy
- Microsoft Education

B
Interview guides

B.1
Internal - Educators

#	Subject	Goal
1	Vision on (IDE) education / definition of the future designer	To identify different perspectives on education, design education next to the future / changing role of the designer.
2	Threats for design education	Identify threats for the education of the designers.
3	Opportunities	Perspectives on how to cope with threats or being innovative as a designer, what skills are needed from future designers
4	How design education is developed / designed	To investigate & map opportunities in the development of learning activities and courses

B.2
External - Alumni

#	Q	Goal with question
1	What was a big challenge in the transition from education to job?	To identify underlying struggles of design graduates when looking for a new job as design professional.
2	What were your expectations before you started working as a design professional? Which ones matched, which ones didn't?	To identify expectations of design graduates that are created during their education towards new job as design professional.
3	What is the most important thing you missed in your education at IDE and would be valuable for now?	To gather relevant skills needed from the business side that are relevant today and for the future.

B.3
External - Companies

#	Q	Goal with question
1	What do you define as a designer?	Because the role of the designer is changing, different definitions of the designer arise. For gathering insights that could be relevant for the expected skills of designers, their definition according to the one interviewed should be asked first.
2	What do you expect from a designer within your industry?	The expectations of the business side from designers and what see they as relevant skills of today.
3	What do you think is necessary in the education of the future designer?	Identify what is needed for designers to learn first before they become a design professional and find a better connection to the labor market

C

c.1
Interview - main insights

Student - Session & Interviews

1. “I am seeking confirmation with my coach, but I am anxious he or she does not have the time.”

2. “Collaborations can be hard even with people from other masters or international people.”

3. “I want to present something that I am proud of.”

4. “It is always a challenge to identify the right problem to solve before a project starts.”

5. “At the end, I always want to have more time.”

6. “I want to get a high grade, but with the lack of time I am afraid I am not able to.”

7. “I want to satisfy my coach to get a high grade.”

8. “Miscommunications within the teams happens every day.”

9. “I want to develop myself as a unique designer. I am working every quarter on my positioning in order to differentiate myself.”

10. “I often get lost in the overload of information possible.”

11. “I have the need to share my ‘bad’ experiences with my peers in order to look if they are experiencing the same.”

12. “I have the need to search for information that is outside the course in order to seek for unique insights.”

13. “I want to upskill my visualization and presentation skills.”

14. “Sometimes I like the idea so much at the end of a project, that it is a pity we do not experience or learn how to really implement it.”

15. “I have created my own network of friends and designers who can tell me what is relevant for me in my journey towards a design professional.”

“I want to be more responsible in choosing my courses”

“I have the need to seek confirmation constantly with my peers and educators”

“I want to get a high grade, but I am afraid I am not able to”

“I want to learn more about the implementation of my ideas”

“I want to get more confident in the design process”

“I want to create my own network of people who can tell me what is relevant.”

“I want collaborations to be efficient and effective.”

Alumni

16. “I still experience it as a hard task to work with not like-minded people with totally different ideas, background and way of working.”

17. “I needed to learn how to manage client expectations, scoping, deliverables. I missed the understanding of how to design something that needs to be realized, the transition from idea to a real product or service.”

18. “Finding a fitted job was the hardest part in my transition from graduate to a working professional.”

19. “I would like to have learned more about digital skills and learning how to use new technologies, or some history behind it. “

20. “I have to take responsibility more in my own development and learnings, as it is not the same as in university.”

21. “IT knowledge would be helpful now, but not something suited to IDE so didn’t expect to have that in the program.”

22. “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.”

23. “I wanted to have more business perspective in design. Eventually, companies want to take upon projects that increase profit or create other measurable value for their business. Whereas during education we only focus on ‘creating better experience’ or ‘building future visions.”

24. “My expectations were that I was able to use and combine design methods I’ve learned. But I missed some implementation / realization skills.”

25. “I had to learn to work with people all over the world and manage my own projects.”

26. “I would like to have a bit of a booklet or portfolio with all the design methods I personally like in projects, as I often want to combine them in projects I have now. I have the Dutch design guide but I forgot what steps are the most valuable for strategic projects.”

“I still need to learn how to manage client expectations and collaborate with them.”

“I want to teach design methods to others who are not used to design, to get the best insights.”

“I have the need to take more responsibility in my learnings, as it is less stimulated than in university.”

“I want to learn how to combine and communicate the methods I have learned into the real-world.”

“Finding a fitted job was the hardest part in my transition from graduate to a working professional.”

“I want to have more business perspective in design. Eventually, companies want to take upon projects that increase profit or create other measurable value for their business.”

“ICT knowledge would be valuable.”

“I need to learn a bit of every industry of a certain project, to make the collaboration work.”

Companies

27. “We expect our designers to be able to adapt really quick, in one sentence, this accounts for all designers as we are moving from products to services with no exact end user.”

28. “Some ICT knowledge would be valuable.”

29. “I want my designers to have a perspective of the real world and how to collaborate in it.”

30. “Designers are also our process leaders, as they have to guide the team through the design process.”

31. “I expect from my designers to turn something complex into something understandable and generalized, but also personalized at the same time.”

32. “Be confident and social as a designer, because as we are implementing more design now, they have to be able to represent the design process clearly.”

33. “Designers become facilitators, educators of design thinking and also creators of new digital solutions. So, learning how to adapt or being flexible with the changing minds of clients and trends around the world. Also, communication is an important skill in our sector.”

34. “We educate our employees by ourselves, so we need curious and motivated designers who want to learn more.”

35. “Curiosity is needed from designers.”

36. “A business perspective of the designer should be learned at university.”

“I want my designers to be able to adapt fast to changes and be flexible.”

“I want my designers to be able to create structure into chaos.”

“I want designers to be able to guide the team through the process of design thinking, as this is quite a fuzzy one.”

“I need my designers to be confident in presenting new ideas and visions to clients.”

“I need my designers to be curious about new industries and technologies.”

“I need my designers to teach the design didactics to others, so we can expand design thinking over the organization.”

“I need my designers to think holistic and analytic, for identifying the right problem to solve.”

Educators & Experts (IDE, TU, 4TU, TUe)

37. “Keeping the quality of the students with both the digitalization and growing student population is a hard challenge.”

38. “I have become also a life coach for my students.”

39. “Our design students have to become more agile and resilient, in order to be comfortable when they are outside their comfortzone.”

40. “I aim for creating a life-long learning vibe at IDE.”

41. “IDE will transcend the other faculties with its design education. For designers, they are able to realize ideas more and know how to start an innovation instead of participating.”

42. “Designers will be facilitators and collaborators and are used for their creative problem framing and solution thinking.”

43. “Students are way to much result focused, but I feel we are supporting that with rubrics and short amount of time.”

44. “I feel design students miss the implementation step of realizing their ideas into the real world.”

45. “Collaborations between other faculties are less stimulated now.”

46. “In order to give students a more real-life perspective, businesses should be involved more in the courses.”

47. “Designers are able to teach design thinking to others next to their traditional designer skills.”

48. “I feel we should implement more design didactics into the curriculum.”

49. “Students can learn a lot of each other, but we have to go further than only present things to each other.”

50. “As educators, we have to be more creative with our resources for keeping our education and knowledge up to date.”

51. “I am afraid for the generation gap between me and the coming digital native students. There may be a chance that students become smarter than me

52. “Designers will become better collaborators, connectors and facilitators and will be a cultural expert in teams.”

53. “With collaborations, we might not learn our students what we want them to learn.”
54. “The future of both design and education is quite insecure.”

55. “Blended learning is quite exhausting for teachers.”

56. “Among students, less room for failure is experienced.”

57. “COVID has shown the big ability to adapt to an online environment.”

58. “The motivation and learning behavior of GEN Z will be way different than we are used to.”

“I want our education to become more process focused instead of result focused.”

“I also have the need to support students in their mental well-being, as I recognize design students are perfectionists and experiences high levels of stress.”

“I want students to be comfortable when they are outside their comfort zone.”

“I want students to embrace the diversity and creativity of collaborations more.”

“I want to implement design didactics more into the curriculum, because I think we can learn design by teaching it.”
“I want to prevent the generation bridge between digital native students and educators.”

“I want transcend design thinking into other faculties, in order to create a possibility to go beyond the disciplines of design.”

C

c.2
Empathizing session

As stated in the project brief, a learning experience involves any emotions and interactions between students, educators, externals 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 (IBE UNESCO, 2013). In order to gain insight in the strengths and weaknesses of the current learning experience of IDE MSc. students, a learning journey is mapped that occurs over a period of time and involves a whole series of different learning elements (for example projects) and learning experiences (collaborative, individual, challenging etc.) involving different methods and channels (LEO learning, 2015).

The developed learning journeys do not include the content of the courses but focuses on the process students go through when attending a course or so, a whole master. By looking at the current learning journey of a student, pains and gains can be defined already. Through the programs of zoom and Miro, questions are asked,

Method & Participants

The method is divided into two parts: learning experiences through one course and learning experiences developed throughout a whole master program. The reason for this is because of the fact that a whole master experience can be seen as quite different than an experience of one course. The course learning experiences are more focused on how the knowledge is generated by students and the whole master experience focusses more how the generated knowledge from courses helped them in the transition towards a design professional.

Participant selection

In order to gather relevant insights that eventually could be generalized as experiences, students of all master programs should be included. For the journey of one course, participants have to complete at least the first year of the master in order to communicate a complete picture of their experience. For the master program experience, graduates and alumni are asked as participants as they already completed (or almost) one of the master programs.

	One course – questions asked
1	What was the starting point of the course and what did you saw as an ending point of the course?
2	Can you describe the steps you went through that brought you from the starting point to the end?
3	What did you saw as hurdles during the course and how did you handle them?
4	Where there moments caused positive emotions like motivational, happy, relieved?
5	Where there moments that caused negative emotions like anger, disappointment or sadness?

	Master Program – questions asked
1	Can you explain the reason for the choice of your master?
2	What were your expectations of the master program?
3	Which ones matched, which ones did not?
4	Did you have any learning goals before starting your master? Which ones has been fulfilled? Which ones not?
5	Can you describe your experience of the first year of the master? What did you do, why and how did you felt?
6	Can you do the same for the elective space?
7	Can you describe your experiences of your graduation?
8	When looking back, what did you like? What did you not like? What would you have done differently?

D

c
Factor Collection

1. Technology take-over

Changing interactions due new communication tools
– Trend / social
The need to understand interaction in context and over time, rather than to focus on immediate usability or user experience. An understanding of how products and services fit into people's daily routines and social practices is essential, as this will be different in the future with new communication tools.Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse.

Chatbots
– Development / Technology
Human Robot Collaboration to design a safe, trustworthy and rich dialogue for task solving such as manufacturing (co-production) or theatre (co-performance).
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

Facilitator role
– Development / Educational
As students become prepared for a globalized, knowledge-based world driven by technology, teachers become models of the learning attitudes and get creative, connected, collaborative, skills to instill through their learning activity designs (Fullan, 2013). This requires a paradigm shift that facilitates seamless collaborative working with digital tools, and redirects the role of the teacher from pedagogue to facilitator of self organisation and leader of learning processes in both face- to-face and digital spaces (Royle & Nikolic, 2016).
References: Fullan, M., & Langworthy, M. (2013). Towards a new end: New pedagogies for deep learning. & Royle, K., & Nikolic, J. (2016). A modern mixture, agency, capability, technology and 'scrum': Agile work practices for learning and teaching in schools.

3D printing
- Development / technology
It offers design with fast ways of production of prototypes, sustainable material, sustainable process. Takes a lot of time now but will evolve in the future.
Reference: Balletti, C., Ballarin, M., & Guerra, F. (2017). 3D printing: State of the art and future perspectives. Journal of Cultural Heritage, 26, 172-182.

Flipping the classroom
– trend / technology
Videos, livestreams are used to increase the interaction in blended learning experiences.
Reference: Knapp, N. F. (2018). Increasing interaction in a flipped online classroom through video conferencing. TechTrends, 62(6), 618-624. & learner journey

AI
– Trend / technology
Algorithms, Smart homes, smart watches will determine people's lives and decisions.
Reference: Accenture (2020). Revisting the tech vision after COVID-19.

Value of data
– Trend / technology
As electronics have increasingly entered our lives, we now generate huge amounts of data. The promise of customer intimacy through personalized experiences and 1-to-1 marketing, has made big data a 'must win battle' for many companies. Today, most companies are struggling to master data analytics, striving to make it a key competence, so they can turn data into value.
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

AR & VR in education
– trend / technology
Research has identified that Generation Z has a short attention span, gen Z students prefer to answer short, online exams and learn through short snack-videos.
Reference: Schwieger, D., & Ladwig, C. (2018). Reaching and Retaining the Next Generation: Adapting to the Expectations of Gen Z in the Classroom. Information Systems Education Journal , 16(3), 46–54. Retrieved from https://files.eric.ed.gov/fulltext/EJ1179303.pdf

Digital transformations
– Principle / technology
The digital transformation is boosting the race for world technological leadership.
Artificial intelligence (AI), the Internet of Things, non-classical computing, and also bio-engineering are going to revolutionize the worlds of engineering, engineering business and society at large.
Reference: Aldert Kamp

The online university
– Development / Education
Blended learning is on the rise; education programs are developing an optimal mix of face-to-face and online learning methods. This motivates students more than either pure classic or pure online education. Important factors when considering online education are supervision/coaching, communication, and certification processes. As a result, the role of the physical faculty will change into a meeting place and will have a smaller role in the lives of students. So, in the case of collaborative-learning, aspects like motivation, attitude and cultural-acclimatization will become increasingly important. This requires the development of surroundings that facilitate these aspects.
Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse.

Working remotely – Trend / Economic
In the future, people will be working more remotely. This trend is accelerated by COVID.
Reference: Leonardi, P. M. (2020). COVID-19 and the new technologies of organizing digital exhaust, digital footprints, and artificial intelligence in the wake of remote work. Journal of Management Studies.

Multiple use of devices
– Trend / Technology
Products will become part of product-service systems, which in turn will evolve into complex socio-technical networks. Human-to-human services will also increasingly use digital technologies, enabling the sharing economy.
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

Belonging
– Principle / Social
People need a sense of belonging to specific groups to be able to identify themselves and ultimately define themselves.
Reference: Forsyth, D. R. (2018). Group dynamics. Cengage Learning. Chapter 3: Inclusion and Identity, 3-3, 83-90.

Design for the long term
– Trend / Social
The shift from the fulfilment of individual needs to quality of life and society: there is a need to understand how design can aim for long-term personal well-being and a healthy and sustainable society, by impacting people's behaviour, experience, and standards. It becomes important for designers to know how to use technologies in this development. For example health apps that help people to create a healthy lifestyle for the longer term.
References: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse. & Langrial, S., Lehto, T., Oinas-Kukkonen, H., Harjumaa, M., & Karppinen, P. (2012, July). Native Mobile Applications For Personal Well-Being: A Persuasive Systems Design Evaluation. In PACIS (p. 93).

2. Organized complexity

Multi-angled view
– Principle - Psychological
For creative thinking it is of big relevance to change the angle of view.
Reference: Funke J. (2012) Complex Problem Solving. In: Seel N.M. (eds) Encyclopedia of the Sciences of Learning. Springer, Boston, MA. https://doi.org/10.1007/978-1-4419-1428-6_685

Wicked, intertwined problems
– Trend / Social
There is, in the twenty-first century, an intense interest in the nature of wicked problems and the complex tasks of identifying their scope, viable responses, and appropriate mechanisms and pathways towards achieving improvement. Wicked problems arise in every sector due the rising production network. In short, wicked problems are ill-defined,
ambiguous, and associated with strong moral, political and professional issues, it is also defined as complex problems.
Reference: Hussain, N., & Ritchey, T. (2011). Wicked problems. Eur J Ind Pharm, 31, 4-7.

Production networks becoming more complex with new technologies
– Trend / Technology
Due digitalization, the opportunity to find the best people/materials etc. all over the world, is growing next to the fact of the development of services. However, this will cause a big network of stakeholders, that will increase the complexity.
Reference:

Political turbulence
– Trend / Social
The increasing power of large technology companies is leading to increasing social criticism. This increases the political and social pressure to split up big tech. This increases the political and social pressure to split up big tech.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

Cultural experts
– Trend / Social
It will be more likely that a product will be designed for people in different parts of the world and with a wide range of cultural backgrounds. Also design teams might be more based in different parts of the world. This makes it necessary that design professionals gain cultural awareness and have expert knowledge in and sensitivity to different cultures.
Reference: Justice, L (2019) The Future of Design Education. Dmi:review, volume 30, issue 1: 33-37]

Urbanization – smart cities
– Developments / Demographic
With so many people packed into the cities, new solutions are required to facilitate urban mobility. Future urban vehicles may include alternative powered automobiles, bicycles, buses, trains, trucks, helicopters, watercraft, cable cabins and many more. However, these developments lead to major design challenges, for example multi-modal travel solutions, connected systems, and smart city infrastructures.
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

Complex design challenges
– Trend / Social
The challenges we will face in the future, fed by our technology opportunities, growing society and the constant stream of data, are global, complex and intertwined. These challenges ask for different approaches in design than we are used to.
Reference: Voûte, E., Stappers, P. J., Giaccardi, E., Mooij, S., & van Boeijen, A. (2020). Innovating a Large Design. Education Program at a University of Technology.

Online community building
– Development / Social
Digital platforms and experiences are becoming many people's primary source of interaction and ideas should be thought of where companies start building personalized, interactive, and shared virtual communities today can carry that success far into the future.
Reference: Accenture (2020). Revisting the tech vision after COVID-19.

No person is an island
– Principle / Social

People always seek for the sense of belonging through connections. People are wired to connect.
Reference: Dam, R. (2017). Social Evolution and why we need to communicate. Interaction Design.

Complexity and design
– Development / Social
Products will become part of product-service systems, which in turn will evolve into complex socio-technical networks. Human-to-human services will also increasingly use digital technologies, enabling the sharing economy.
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

Managing the complex problems
– Principle / Psychological
If a problem is too complex, people solve it by breaking it into small parts. When thing are smaller, it becomes more understandable and manageable.
Reference: Interview Peter le Clerq, Design strategist (2020).

All about efficiency and speed
– Development / Technological
People are developing themselves around speed. Everything has to be done fast and efficient.
Reference: Reference: Stelten B. (2012). Young People Are Watching But Less Often On TV. The New York Times. & IDE students

3. The ongoing self-development

Appreciation
– Principle / Psychological
Appreciation as a driver for confidence building and motivation. Among students, they constantly seek for confirmation and appreciation form their teachers and find the motivations to work further.
Reference: Jere Brophy (1999) Toward a model of the value aspects of motivation in
education: Developing appreciation for.., Educational Psychologist, 34:2, 75-85,

Studying part-time
– Development / Education
Due the high costs of education, the ability to follow part-time education and single courses, the traditional education system is forced to change.
Reference: OECD. (2018). The future of education and skills: Education 2030, The future we want.

Student is becoming a customer of its own education
– trend / Education
New-age learners are more “consumers”, want a quick return on investment and full control of their learning path because they may already be working or have a family. They want, even more than regular students, learning that is learner-centered, affordable, technology-enabled, accessible at any time across the globe, and preferably creative and innovative. They want to follow separate packages of knowledge, delivered by the best lecturers and available from a pool of modules, and re-bundle them into personalized curricula and stack credits gained from on-campus. Students get quickly disappointed when a course does not fit their expectations
Reference: Kamp, A. (2020). Navigating through the landscape of higher engineering education. 4TU
Reference: learner journey

Power of the consumer
– Trend / Social
Consumers publicly denounce negative experiences at organizations, for example via social media. This can cause major damage to the image of an organization. This increases the power of the consumer in society.
Reference: CBS (2019). Trends in Nederland 2019. Centraal Bureau voor de Statistiek, Den Haag/Heerlen/Bonaire, 2019

21st century skills – State / education
Collaboration, critical thinking, communication, self-management and creativity.
Reference: OECD. (2018). The future of education and skills: Education 2030, The future we want. Paris.

Still unknown definition of industrial design
– state / social
Alumni and students still experience a lack of knowledge among companies about the definition of an industrial designer
Reference: Interview, Alumni Josefien Scholtes (2020)

Recognition
– State / Social
As a lot of companies do not know quite the definition of the industrial designer, it is experienced as a challenge to be recognized as someone with a lot of highly educated abilities.
Reference: IDE Alumni

Critical thinking as a must skil
l– Trend / Development
Critical thinking is using logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems and seen as an important value in solving complex problems.
Reference: OECD. (2018). The future of education and skills: Education 2030, The future we want. Paris.

Competition
- Developments / Education
As a reaction to the changing education industry to become more digital, universities try to stay more relevant and competitive by opening their education for externals: moving from a collegiate, exclusive model of education, to an open, transparent one (Mulgan et al., 2016).
Reference: Mulgan, G., Townsley, O., & Price, A. (2016). The challenge-driven university: how real-life problems can fuel learning. Nesta.

Online identity
– Development / Social
Social media appearance, gen z, linkedin, digital world, online avatars, showing online who you are and want to be.
Reference: Thomas, A. (2007). Youth online: Identity and literacy in the digital age (Vol. 19). Peter Lang.

Be relevant digital
– Development / Education
The multidisciplinary nature of our professional field requires students to have relevant T profiles. Given the increasingly dominant role of the digital domain, IT knowledge and programming skills will continue to become more important.
Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse.

Inequality in education – Trend / Education
The rise of private (additional) training and the rising costs of education mean that not everyone has access to the same educational opportunities.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

Personalized learning – Trend / Education
Students want an education programme that best fits with their desires and needs: self-choice is an essential part of this. Also, this is seen in the in the vision statement of the TU Delft: “In our MSc programs we will create room for different graduation profiles by offering our students the possibility to choose electives in their programme”.
Reference: Vision on Education (2019). TU Delft, Executive board: Anka Mulder, Vice President of Education and Internationalization

Coaching is the future of education
– Trend / Education
Due technology, people can now gather information by themselves and this will transform the traditional knowledge transfer approach to a facilitating approach in helping to understand the information.
Reference: OECD. (2018). The future of education and skills: Education 2030, The future we want.

No end-user
– State / Sustainability & Economy
Due the on-demand use of information, services and products there won’t be an end-stop of using things, they just get better and upgraded.
Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse. & Vision on Education (2019). TU Delft, Executive board: Anka Mulder, Vice President of Education and Internationalization

4. A world in Flux

Attention Span.
– Development / Psychological
Technology is changing how we work, learn and communicate but also the way we process information and acquire knowledge. By providing too many inputs and the same time, people’s attention-span has decreased, but the multitasking skill has increased.
Reference: Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. Journal of curriculum studies, 44(3), 299-321. & IDE students

Change is fun
– Principle / Social
A feeling of a diverse stream of information guarantees excitement and inspiration.
Reference: Berlyne, D. E. (1950). Novelty and curiosity as determinants of exploratory behaviour. British Journal of Psychology, 41(1), 68.

Finding other ways
– state / psychological
With the automation of jobs, the development of soft, social skills will become more crucial in the education of future students.
Reference: OECD. (2018). The future of education and skills: Education 2030, The future we want. Paris: Author. Retrieved from https://www.oecd.org/education/2030/E2030%20Position%20Paper% 20(05.04.2018).pdf

Designers could take on a variety of roles
– State / Economic
The role of the designer is becoming broader and can be used for multiple roles
Reference: Interview Jeroen van Erp (2020), Company.

Process focused
– Development / Educational
Collaborations are processes with an end-result. By preparing students on the outside world with more collaborative settings, the assessment should be more process focused.
Reference: Workshop 4TU about collaborations, learner journey, interview educators

Different ways of trusting
– Trend / Social
News is validated by the number of shares and ratings of people and not by the truthfulness of the stories. What really matters is only if the story is going around.
Reference: Meyer R. (2018, March 8). The Grim Conclusion of the Largestever
Study of Fake News. The Atlantic.

Change is the only constant factor
– State / Psychological
As we are living in a rapid changing society, people become aware that the only thing that is the same is change.
Reference: Lynch-O’Brien, L. I. (2020). Change Is the Only Constant.

Complex problems are unexpected
– State / Economic
Complex problems can happen any time: the collapse of a currency, the global financial crisis, soaring oil prices or a natural disaster that require immediate and coordinated action.
Reference: Funke, J., Fischer, A., & Holt, D. V. (2018). Competencies for complexity: problem solving in the twenty-first century. In Assessment and teaching of 21st century skills (pp. 41-53). Springer, Cham.

Attention society
– State / Social
People are confronted 24/7 with information via social media, reports and news, as well as illegal advertising and other advertisements.

Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

The future as a VUCA world
– state / social
In order to describe this ‘world of change’ or ‘uncontrollable environment’ people are living in, acronyms like the word VUCA arise. In short, VUCA stands for volatility, uncertainty, complexity, and ambiguity (Kraaijenbrink, 2018). All four represent distinct elements that make people’s environment, the world, a market, an industry or the development of the individual, harder control and how to react on it. Volatility refers to the speed of change in the environment, Uncertainty refers to the extent to which people can confidently predict the future, Complexity refers to the number of factors that have to be taken into account next to the variety and the relationships between them and Ambiguity refers to a lack of clarity about how to interpret something.
Reference: Forbes, Kraaijenbrink, J. (2018). Whas does VUCA really mean? https://www.forbes.com/sites/jeroenkraaijenbrink/2018/12/19/what-does-vuca-really-mean/?sh=55fd056c17d6

Curiosity
– State / psychological
It is human that people are curious.
Reference: Silvia, P. J. (2017). Curiosity. In The science of interest (pp. 97-107). Springer, Cham. & Interview Frido Smulders

Flux world
– State / Technology
Engineering education must prepare students to thrive in this world of flux, to be ready, no matter what comes next.
Reference: Aldert Kamp (2020)

Attention Span - multitasking – Development / Psychological
Technology is changing how we work, learn and communicate but also the way we process information and acquire knowledge. By providing too many inputs and the same time, people’s attention-span has decreased, but the multitasking skill has increased.
Reference: Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. Journal of curriculum studies, 44(3), 299-321. & IDE students

Filling the gaps by the students themselves
– state / Economic
As the society is changing rapidly, it is hard for universities to keep the education of students (design students) up to date with the latest technologies. It has become a responsibility of the student itself to learn about those new technologies and how to implement them.
Reference: Interview Alumni

Open innovation spaces / living labs
– Trend / Economy
Real experiment labs or direct user research by agile methods and system testing. This includes real computing and experiment-based working support as well as flexible adaptation to the specific demands of designers, projects, etc.
Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse.

Trust the process
– State / Education
For designers, process is the language of rigor, and a particular process nearly guarantees a desired outcome. Trust the process, it will always produce results, but maybe not the ones designers expect in the first place
Reference: Kolko, Jon (2013), “Trusting the Design Process”. In interactions magazine, March/April, 2013.

Lifelong learning
– Development / Educational
People are more concerned by the outdating of their skills next to aging and the fast pace of the changing society. The timing of education will be spread out over life and the master’s degree will just be a door to the labor market but does not act as an ‘end-sign’ of people’s education.
Reference: Green, A. (2002). The many faces of lifelong learning: recent education policy trends in Europe. Journal of education policy, 17(6), 611- 626.

Not holding on
– Trend / Psychological
Students to not hold on the old traditions and expectations of the society anymore. Choices are made on the on-demand information they get, based on trends and innovations. You see this in clothing etc. In design, we do not hold on the ways of design methods, we are going to a further were we innovate and combine the traditional methods in order to work with others, but also come up with more relevant solutions.
Reference: IDE students

5. A New Vocabulary on the Mental state

Lack of resilience – State / Education
Design students experience a lack of resilience when doing projects on their own.
Reference: Interview Rebecca Price

No room for failure among students
– State / Psychological
Students experience a high pressure of time, which causes the experience of no room for failure. Failures are still important for the quality of products and services and should therefore be encouraged.
Reference: 4TU workshop collaborations, learner journey IDE

High pressure society
– Trend / Psychological
People will be developing burnouts by the pressure of society that they experience a feeling of the fact that everything they do it will still not be enough. Society is faced with the question of how the pressure to perform can be relieved and how we deal with stress and burnouts.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

Lagging behind
– Trend / Economic
For companies to work on relevant problems, lifelong learning programs for professionals need to provide state-of-the-art knowledge and perspectives to their employees. Rather than a nice add-on to the current formal three- or four-year degree programmes, upgrading and gaining fresh perspectives need to become a concept around which university systems are organized. Thus, universities will develop into an active learning partner for a person’s entire (working) life, stretching beyond the classroom and their occupational knowledge
and skills. At the same time however, engineering businesses do question whether universities are the most appropriate partners to upskill their professionals. Companies are at the forefront of the digital transformation for instance, universities are lagging seriously behind
Reference: Interview Rob Mudde (2020)

Coping with speed
– Development / Psychological
The fast speed of change and developments requires people to take their chances as quickly as possible, since these opportunities are changing and shifting at a rapid speed to. It is a challenge for people to keep up and handle the insecurity that comes along. Technology affect these dynamics in both positive and negative ways.
Reference: learner journey IDE

Gap between education and job
– Development / Economic
Students often experience a knowledge gap when entering a company. They have to be able to keep up and accelerate the transition from student to work.
Reference: Interview Alumni, Podcast Design Strategy of Josefien Scholtes

Getting a job as the objective
– State / Economic
After graduation, students become part of the Alumni. However, Individuals tend to undervalue the long-term benefits of upskilling in the trade-off against short-term investments in time, effort and money, and the provision is still scattered and fragmented. Building lifelong partnerships is the opportunity.
Reference: Dervojeda, Kristina; Koonstra, Anton; Skills for Industry: Curriculum Guidelines 4.0; curriculum guidelines for Key Enabling Technologies (KETs) and Advanced manufacturing technologies (AMT) p6

Fear of being replaced
– Developments / Economic
Robotization and the automation of society make many human actions unnecessary. This can lead to more unemployment. The question is what societies will do with the labor power that is released and how an increase in income inequality can be prevented.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

New ways of vulnerability
– State / Technoloy
People will always feel vulnerable, but with new technologies, the sharing economy and the use of IoT, privacy, safety, and quality of life for the individual user participating in a distributed multi-user system that runs over the internet.
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

Choices overload
– Principle / Psychological
Providing too many options ensures confusion and stress among people
Reference: Margenau S. (2016). Decisions, Decisions: How Offering Too Many Choices Can Drive Your Customers Away. & Learner journey

Coaching is the future of education
– Trend / Education
Due technology, people can now gather information by themselves and this will transform the traditional knowledge transfer approach to a facilitating approach in helping to understand the information.
Reference: OECD. (2018). The future of education and skills: Education 2030, The future we want.

Mindfulness
– State / Psychological
Mindfulness refers to a conscious awareness of and attention to one’s thoughts and actions moment by moment with beneficial affects against stress, increase of productivity and performance.
Reference: Kristensen, M. L. (2018). Mindfulness and resonance in an era of acceleration: a critical inquiry. Journal of Management, Spirituality & Religion, 15(2), 178-195.

Design for the long term
– Trend / Social
The shift from the fulfilment of individual needs to quality of life and society: there is a need to understand how design can aim for long-term personal well-being and a healthy and sustainable society, by impacting people’s behaviour, experience, and standards. It becomes important for designers to know how to use technologies in this development. For example health apps that help people to create a healthy lifestyle for the longer term.
References: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse. & Langrial, S., Lehto, T., Oinas-Kukkonen, H., Harjumaa, M., & Karppinen, P. (2012, July). Native Mobile Applications For Personal Well-Being: A Persuasive Systems Design Evaluation. In PACIS (p. 93).

Supportive education
– Development / Education
The rapidly changing world with the overload of information is already overwhelming for fresh starters. As teachers become more of a coach in the learning processes of students, they also become more life coaches in order to create though leaders. It is crucial to provide safe spaces where students can be empathetic and supportive when sharing their contributions, and where they can talk and write about what has been learned. This culture allows everyone to benefit from failure and makes these discussions more common, conventional, and constructive.
Reference: Kamp, A. (2020) Navigating through the landscape of higher engineering education. 4TU.

Lack of knowledge on how to implement new ideas
– State / Social
At universities, students learn how to think but are missing the step what comes after thinking. What is needed in our future society, is that our graduates are willing and knowing how to take risks by

implementing ideas in the outside world.
Reference: Interview Alumni & Businesses, Jeroen Coelen (2020)

Mood-swings
– State / Psychological
Design students experience a lot of positive but also depressing mood-swings when they are in an uncomfortable setting.
Reference: Rebecca Price, Interview (2020) & learner journey

6. The Modern Purpose

Investigation of conscious lifestyle choices – Development / Phycological
The rise of socially conscious consumptions and lifestyle movements. Trends like going green, buying local or eating less meet, contribute to this. People want to make more social conscious choices: Socially conscious consumption "is a way for consumers to manifest their prosocial concerns through private shopping choices". More and more youths engage in a "search for ethical consistency," in which their everyday actions and practices match their ideals.
Reference: Cherry, E. (2015). I was a teenage vegan: Motivation and maintenance of lifestyle movements. Sociological Inquiry, 85(1), 55-74.

Role models – Development / Social
In our world, people always have role models where they get their inspiration form, but also learn from their behaviors. Using role models has a positive effect on the learning behavior of students. Also, involving alumni in education at universities are also more, they will be attracting more, in this case, designers with personal experience in the private industry sector to become role models for students and give a real life perspective to students.
Reference: CDIO seminar: Towards agile, interdisciplinary and individualized engineering education; Chalmers University 17 October 2019

Curiosity
– State / psychological
It is human that people are curious.
Reference: Silvia, P. J. (2017). Curiosity. In The science of interest (pp. 97-107). Springer, Cham. & Interview Frido Smulders

Looking for meaning in life
– Principle / Psychological
People used to identify with their work and profession. The robotization and automation of society gives people time for other activities. The question is where we now get our identity and happiness, which also can cause stress. People are more likely to go a life coach or psychologist.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

Feminism
– Trend / Social
Feminism will go on, with a focus on equality on the work floor
Reference: Machado, J. Turner, K. (2020) The future on feminism. Five feminists explain what goes next.

Lending a proud hand
– Trend / Social
People are taking an active role in participating in social initiatives to shape their city, community or university. Lending a hand because they are proud of what they belong to.
Reference: CBS (2019). Trends in Nederland 2019. Centraal Bureau voor de Statistiek, Den Haag/Heerlen/Bonaire, 2019

Looking to the outside world
– State / Education
With the shifting position of the university in society, it is expected that degrees of the future will become more employer led. Educational programs shall therefore not only be aligned with the latest developments in research and science, but also with those in engineering practice.
Reference: Kamp, A. (2020) Navigating through the landscape of higher engineering education. 4TU.

Impact with ideas
– State / Social
Designers want to make an impact in the world
Reference: Learner journey IDE, (2020).

Break free from plastic
– Trend / Sustainable
The world is busy with a whole transition to become more sustainable by replacing old materials, manufacturing methods and products by more sustainable ones.
Reference: The big Clean up

Design in sustainability
– Trend / Sustainability
People are now increasingly open to buying sustainable products, participating in recycling systems, and changing their behavior, especially those in the younger generations. They are much more interested in using things rather than owning them. Developments in 'design thinking' reflect these changes, for example 'design for the circular economy' looks at extending the life cycle of products, systems and components before looking at the material Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

Increasing awareness of sustainability problems
– Development / Social
Due to climate change and declining biodiversity, sustainability is getting more attention and consumers attach more value to sustainable products.
Reference: CBS (2019). Trends in Nederland 2019. Centraal Bureau voor de Statistiek, Den Haag/Heerlen/Bonaire, 2019.

The use of social media to increase awareness
– Trend / Social
Social media and influencers are often used to increase the awareness or a certain behavior among people. This accounts for social problems, marketing of brands etc.
Reference: Kaur, A., & Chahal, H. S. (2018). Role of social media in increasing environmental issue awareness. Researchers World, 9(1), 19-27.

Fear of being replaced
– Developments / Economic
Robotization and the automation of society make many human actions unnecessary. This can lead to more unemployment. The question is what societies will do with the labor power that is released and how an increase in income inequality can be prevented.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

Aging
– Development / Demographic
By 2040, The 65+ European population is expected to grow extensively. There will be 2 people of working age (15-64) for every person aged 65+ in 2060, compared to 4 in 2010. This will need deep societal change in order to adapt to the changes in its working resources.
Reference: Melero, F. J., Barakovic, S., Lameski, P., Zdravevski, E., Maresova, P., Krejcar, O. & Trajkovik, V. (2020). Aging at Work: A Review of Recent Trends and Future Directions. International Journal of Environmental Research and Public Health, 17(20).

Developing interesting characteristics
– Trend / Educational
People have more access to higher education, online courses and traineeships in order to make their 'profession' of 'job' more unique and relevant in the competitive labor market. Although the goal of a research master is to prepare students for becoming research specialists with a fundamental knowledge of a single field of expertise, the programs often ignore that 90% or more of their graduates will be involved in innovative engineering and design and entrepreneurial activities.
Reference: Student entrepreneurship at research-intensive universities: from a peripheral activity towards a new mainstream; a LERU Advice Paper no. 25, LERU, Leuven, April 2019, www.leru.org.

7. Beyond walls

Creativity of the crowd
– Development / Social
Crowd working, crowd sourcing and crowd funding are emerging services. Most companies are starting to see the opportunity of sourcing innovation from the crowd. Examples are co-creating innovations in close collaboration with partners and/or customers.
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

People always have 'something'.
– State / Psychological
Technological progress means that more and more diseases and disorders are known. This development comes with an urge to diagnose any problem. This makes being sick the norm.
Reference: CBS (2019). Trends in Nederland 2019. Centraal Bureau voor de Statistiek, Den Haag/Heerlen/Bonaire, 2019.

Developing interesting characteristics
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Reference: Student entrepreneurship at research-intensive universities: from a peripheral activity towards a new mainstream; a LERU Advice Paper no. 25, LERU, Leuven, April 2019, www.leru.org.

Strengthening international collaborations
– Trend / Social
In order to offer students a broader range of collaboration levels and how to be part of social challenges, It is essential to form strong international partnerships or consortia with peers and industry. Universities they will need a living database of potential (project) partners. In order to strengthen the link with industry and to influence the subsidy agenda, it is essential that qualified people are positioned in the right, strategic networks.
Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse.

Access
– Trend / Economic
Accessibility will become more important than owning.
Reference: Gidopoulos, Y. (2019). Access vs Ownership: Really a Revolution? (Medium)

Blurring boundaries – Development / Social
The world is developing towards a network society, where people will be constantly connected. Lines between professions, private life, science and academia will fade.
Reference: Castells, M. (2004). The network society A cross-cultural perspective. The self in the Informational Society. Edward Elgar.

Working remotely
– trend / technology
Working remotely from home has also psychological and collaborative challenges. Universities and companies are challenged by the disadvantages of this reaction of COVID. However, technology brings also the benefit of the ability to find out how to work from

everywhere and how to create blended or fully digital learning experiences.
Reference: Orsini, C., & Rodrigues, V. (2020). Supporting motivation in teams working remotely: The role of basic psychological needs. Medical Teacher, 1-2.

Global education
– Trend /Education
Educational institutions offer transnational programs to appeal new students and support cross-border collaborations. Distance will no longer be an issue anymore for applying to the university students want.
Reference: OECD. (2018). The future of education and skills: Education 2030, The future we want. Paris: Author. Retrieved from https://www.oecd.org/education/2030/E2030%20Position%20Paper% 20(05.04.2018).pdf

Knowing the origin
– trend / Economic
People want to know where the products they use are coming from, how they are produced and what they do the climate
Reference: CBS (2019). Trends in Nederland 2019. Centraal Bureau voor de Statistiek, Den Haag/Heerlen/Bonaire, 2019.

Future of sharing
– Development / Economic
The boundaries in our world are fading and are replace by the network. In the future, the sharing economy is “the peer-to-peer based activity of obtaining, giving, or sharing access to good and services”. Alternative names for this phenomenon include gig economy, platform economy, access economy, and collaborative consumption.
Reference: Yaraghi, N., & Ravi, S. (2017). The current and future state of the sharing economy. Available at SSRN 3041207

Digital nomads
– trend / demographic
Digital nomads are portrayed as young professionals working solely in an online environment while leading a location independent and often travel reliant lifestyle where the boundaries between work, leisure and travel appear blurred.
Reference: Reichenberger, I. (2018). Digital nomads–a quest for holistic freedom in work and leisure. Annals of Leisure Research, 21(3), 364-380.

Internationalization – Trend / Demographic
International knowledge exchange is becoming more important, leading to an increase in international contacts, which in turn stimulates professionalization. This is a result of improved external mobility, as well as the internationalization of our own internal organization. Both students and lecturers possess the knowledge and skills that enable them to work together with and live with other organizations and citizens.
Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse.

Transformation – Development / Social
We are moving from an experience economy to a transformational economy. In the past, the experience was about everything around the brand and the product or service. In the future, the quality of the product or service and the effects of using it will become an integral part of the experience: people want to transform themselves. They want to become healthier, smarter, faster, better, etc. These desires fuel design for transformation.
Reference: Future trends in Design Engineering (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse, Jouke Verlinden

8. Equivalent Collaborations

Creative collaboration
– Development / Economic
Increasing collaboration across disciplines, companies and locations, in order to tackle future complex scientific and societal problems, and to face increasing competition. There is a need for more creative connections between different scientific fields, and for increased cooperation and crossovers with the industry and societal institutions. This will bring the best together, aiming for the highest impact
Reference: Future trends in Design Academia (2016). By Daan van Eijk, Deborah Nas, Joost Niermeijer, Lianne Simonse.

Diversity pushes creativity
- Trend / Social
The benefits and gains are investigated for a group of people when exposed to diversity. The benefits are often higher than risks.
Reference: van Knippenberg, D., Haslam, S. A., & Platow, M. J. (2007). Unity through diversity: Value-in-diversity beliefs, work group diversity, and group identification. Group Dynamics: Theory, Research, and Practice, 11(3), 207–222. https://doi.org/10.1037/1089-2699.11.3.207

Peer to peer learning
– Development / Educational
In the learning process the most effective way for people to gain new information is peer tutorial.
Reference: Workshop 4TU about collaborations

Fading hierarchies
– Development / Economic
Employee ownership has a positive influence on the economic performance of firms, more companies are starting to look at those models. Society is becoming flatter and more equal. People move through many different networks and there is less sense of hierarchy. Many want to share their opinions and experiences and can do so faster than ever thanks to digital media.
Reference: Lampel, J., Banerjee, A., & Bhalla, A. (2019). The ownership effect inquiry: What does the evidence tell us.

Storing experience
– Trend / Social
Experience has long been considered the best teacher of knowledge. Since we cannot experience everything, other people’s experiences, and hence other people, become the surrogate for knowledge. ‘I store my knowledge in my friends’ is an axiom for collecting knowledge through collecting people.
Reference: Siemens, G. (2017). Connectivism. Foundations of Learning and Instructional Design Technology.

Active end-users – Trend / Social
As consumers get more power, their insights are more valued users, co-creation will get more intense. What does that mean for the role of the end-user? Also with more digital collaborations?
Reference: Jeff Desjardin, (2018). The Future of Collaboration in the Artificial Intelligence Era.

Inclusivity
– Trend / Social
An inclusive society is a society where everyone can enjoy themselves. It does not matter what cultural background, gender, age, talents or limitations someone has. Everyone participates in society in an equal way. People are addressed for their possibilities, not for their limitations. Inclusive design is one of the consequences is the rise of inclusive design, design for everyone.
Reference: Buß, R. (2020, July). Inclusive Design–Go Beyond Accessibility. In International Conference on Human-Computer Interaction (pp. 400-407). Springer, Cham.

Generation gap
– State / Social
We are going away from base our choices on traditions to basing them on on current developments. Older generations are more connected to old manners and not used to digital ways of communicating next to this shift. This is also seen in the relationship between older educators and young students where the difference between a digital native and non-digital native is seen.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR. & Leaner journey

Keep the conservatives in mind – State / Educational
In the future, the elder working society will have more space due our aging trend. They still have experiences that will be relevant for further development in the future and coping with similar challenges in the old days. They may not working the same way, but could be valuable.
Reference: Interview Rob Mudde (2020)

Interdependence among others
Participants perceive that they need each other to reach their goals
Reference: Johnson, Johnson, & Smith, 1998.

The experience of the other
– Trend / Social
Students learn best when knowledge transfer is made through the experience of a fellow student, this shows how having a close connection to the topic increases our chances of believing and remembering facts.
Reference: Thaesis (2019). 100 meest relevante maatschappelijke trends. www.theasis.nl mbv. TRNDR.

Miscommunication
– Principle / Social
As our collaborations will involve more disciplines, with multiple ways of working and backgrounds, the chance of having miscommunications within teams will arise
Reference: Interview Peter leClerq, business

Transparency
– Trend / Social
Companies and universities have to be more transparent in their process and knowledge sharing in order to stay relevant. Moreover, it is experiencing that transparency in collaboration increases trust and better communication between stakeholders.
Reference: Daalhuizen, J., & Schoormans, J. (2018). Pioneering online design teaching in a mooc format: Tools for facilitating experiential learning. International Journal of Design, 12(2), 1-14.

Facilitator role
– Development / Educational
As students become prepared for a globalized, knowledge-based world driven by technology, teachers become models of the learning attitudes and get creative, connected, collaborative, skills to instill through their learning activity designs (Fullan, 2013). This requires a paradigm shift that facilitates seamless collaborative working with digital tools, and redirects the role of the teacher from pedagogue to facilitator of self organisation and leader of learning processes in both face- to-face and digital spaces (Royle & Nikolic, 2016).
References: Fullan, M., & Langworthy, M. (2013). Towards a new end: New pedagogies for deep learning. & Royle, K., & Nikolic, J. (2016). A modern mixture, agency, capability, technology and ‘scrum’: Agile work practices for learning and teaching in schools.

Feedback cycles for process
– Principle / Education & Economic
Feedback cycles are necessary to process growth and development
Reference: 4TU interview, IDE learner journey

E e Driving forces

Technology Take-over

By 2030, the world will be fully digitalized where technology has changed the way we communicate, behave, talk and live (Roblin & Voogt, 2017). Technology has turned people's lives upside down, especially when it comes to interaction and decision making in both personal and professional areas. Activities that were done physical, will be fully or partial digital, like learning, communicating and collaborating through the Internet where digital platforms and experiences are becoming people's primary source of interaction (Accenture, 2020), (van Eijk et al. 2016). The global pandemic of COVID-19, even accelerated the digital transformations. These new ways of communication and next to the rise of Artificial Intelligence (AI) ask for a long-term understanding from businesses rather than to focus on immediate usability or user experience. 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 fit invisibly in the daily routines of people continuously and adapt to the needs of the user (van Eijk et al. 2016). People are producing huge amounts of data without even knowing. Companies are more aware of the ability to master skills like data analytics to turn the broad information into value in order to develop the mentioned services and products.

Using and responding to these amounts of data will be in charge of Artificial Intelligence (AI). AI will be fully integrated in the technology of smart homes, smart watches, social media etc. to predict and influence people's lives by making the decisions for them (Accenture, 2020). AI is seen as a collective term for computer systems that can gather multiple sources of data that sense the environment, process, learn, and take action in response. AI will radicalize decision making and completely changes the way people live, learn and do business. AI offers opportunities to personalization and efficiency, but people are still skeptical about trusting robots over humans (Mudde, 2020). The fear towards the take-over of technology is triggered by the fact that digitalization is seen as something 'invisible'. However, this fear will smoothen over time by humanizing technology where benefits will be more highlighted. It becomes a responsibility of the younger generation to integrate the technology smoothly into the world. Designers are expected to have an understanding of new technologies, knowing how to transform data with the aid of technologies into value and translating them to others in a simple way to thrive and control transformations. Technology has made people's lives and relationships smooth and easier and will offer more opportunities. However, it also may have amplified feelings of isolations and loneliness (Katz, 2020) as there might be a sense of losing control over decisions and questioning meaningfulness in relationships.

"Digitalization makes working relationships more complex. Although teams and team members are more connected, the unrelenting emphasis on perfecting the speed of development and innovation processes is pulling away the human element from collaborative work. Consequently, social relationships are more fragmented and impersonal than 20-30 years ago."
- Aldert Kamp (2020), 4TU

The stream of students of Generation-Z (Gen-Z) has arrived, which are comfortable with collecting and using various ways of resources and integrating virtual and offline experiences (Kamp, 2020). They are the first digital-native students, sees technology as an extension of themselves to communicate, deal with friendships, shop for good value, consume information, portray personal identity, and learn. From their earliest youth they have been exposed to the internet, social networks and mobile systems. Their life is a life lived online (Boender, 2011). By 2030, education will be at a point of disruption (Kamp, 2020). Learning and the education of the digital native generation is taking new forms based on the changing behaviors due technological innovations. 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 fully responsibility over their own personal learnings (OECD, 2020) and the role of the physical faculties and places become smaller.

Organized Complexity

The future world consists of networks that have become so tightly knit that disentangling all the connections and interactions becomes impossible (Yaraghi, 2017). In the future, the internet is no longer a thing people will be connected to. It has been evolved into, a computerized, interconnected network. People have started to act and behave differently in order to adapt (Voogt & Roblin, 2012) and 'move around' in a new way. Even the problems and challenges the society faces, are intertwined and highly complex and the problems are wicked and ill-defined (Smulders, 2019), just like the global pandemic or the climate challenges that effects the whole world. Cities become networks where more organized solutions are needed to design them to be better, cleaner and more efficient all at the same time (NOS, 2017). Moreover, it is expected that in 2030 a quarter of the society will be over 65 years old, which indicated the necessity for organized solutions within the complexity of the populations' growth.

The challenges that professionals face are bigger and more difficult to tackle supported by the technology opportunities, growing society and constant stream of data (Voûte et al., 2020). With trying to find solutions or be prepared for those, the relations, dynamics with unexpected outcomes should be taken into account (Funke, 2012), that 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). In the future, professionals will be aiming for the goal to organize complexity. Jane Jacobs already mentioned this when she looked at the understanding of a growing city where she defined organized complexity as "dealing simultaneously with a sizeable number of factors which are interrelated into an organic whole" (Jacobs, 1961).

"A web way of thinking that is involving dynamic interrelationships and sudden changes, and self-diversification as a regenerative force."
- Jane Jacobs, 1961. 290

The professional designer's view is widening from the single user to include context and societal issues that are connected and intertwined (Voûte et al., 2020). In its core, the designer is able to set aside constraints, think beyond the problem as it has been defined and is always open to the discovery and exploration of fields that otherwise remain closed. We need designers come with out-of-the-box solutions that are relevant for the individual user, but simultaneously focus on the bigger perspective. Designers will offer a holistic, organized approach to tackle these complex challenges with a daring and systematized, non-linear and human-centered approach that integrates logic and research for the ultimate results.

"What we need are new choices - new products that balance the needs of individuals and of society as a whole; new ideas that tackle the global challenges of health, poverty and education; new strategies that result in differences that matter and a sense of purpose that engages everyone affected by them."
- Tim Brown (2009), author of Change by Design, CEO of IDEO

E

The Ongoing Self-development

The future consists of consumers that have more power, that ask for on-demand, personalized experiences, where on-demand access is valued over owning (Gidopoulos, 2019). In the early days, people wanted to develop themselves because they were unsatisfied with their current life or the direction it is heading. Now, with all the information and opportunities available, people have the opportunity to develop non-stop and behave in an area full of opportunities for 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 Eijck et al., 2016). This transformational economy is continuously triggered by the constant streams of data and chances of that our digital world gives. This increasing relevance of the on-demand society will shape both people's personal life and economy by transforming services and products into on-demand activities.

The need for on-demand flexibility and personalization is also reflected people's learning behavior and its 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, 2020). Educational institutions will offer more self-directed learning experiences where students have the power and the responsibility to choose their own learning path. The timing of education will be spread out over life and a master's degree will just be a door to the labor market and does not act as an 'end-sign' of people's education (Green, 2002). Life-long learning will become the norm, with the fulfilment of the individual as a key. Universities will respond to this by opening up online education tools that opens opportunities for self-directed and personalized learning, like MooCs (Daalhuizen & Schoormans, 2018).

"Students want an education programme that best fits with their desires and needs: self-choice and interest is an essential part of this."
- Vision TU Delft, 2019

Moreover, personalized learning experiences will offer people opportunities to become more competence-focused instead of time focused, where learners are allowed to learn each skill or topic sufficiently in their own preferred learning method and do not need to waste time when they have already mastered something. It becomes a responsibility of universities to support life-long learning of students next to their continuous motivation for self-development in order to stay relevant in the working industry (Mudde, 2020). This trend includes also personal well-being next to the professional development on the long-term is are supported by flexible learning experiences at the preferred pace (van Eijck et al., 2016). The ability to make people's learning path more personalized and the possibility to learn at any time and at any place, being relevant in the digital world becomes a life goal. However, coming generations will cope with challenges during their development and transformation with failure, feelings of high-pressure, competition and making face-to-face contact (Kamp, 2020) (Price, 2020).

A World in Flux

The digital transformation is changing every part of science and technology in a yet unknown and profound way (Kamp, 2020). With decades of accelerating change ahead, the future will be not just a simple linear extension of the present. Science and technology are changing at an enormous pace next to the needs of the job market and consumer demands. Every system, product or service will have aspects or parts that are dramatically enhanced or disrupted by digital technologies.

"Change is often seen as something scary and uncomfortable, but change can also cause a feeling of a diverse stream of information guarantees excitement and inspiration."
- Berlyne, 1950

Humans have a tendency to define how their world is supposed to work (Gil, 2013). Whenever
something happens in people's personal or professional world, that does not match with the feeling of how it should be, people encounter change and often, discomfort. In our ever-changing, fast-speed attention society, change is inevitable (Lynch-O'Brien, 2020). Many industries face a rising tide of volatility, uncertainty and business complexity that are roiling markets and changes the nature of competition (Doheny, Nagali, & Weig, 2012).

Technology is changing how people work, learn and communicate but also the way of processing and acquiring knowledge. Due the speed of changes, people and companies are aware of the fact that they may not can 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 forces people, companies, governments them 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. The too many inputs coming in simultaneously result in the decrease of people's attention-span but an increased ability in multitasking (Voogt & Roblin, 2012).

In order to describe this 'world of change' or 'uncontrollable environment' people are living in, acronyms like the word VUCA arise. In short, VUCA stands for volatility, uncertainty, complexity, and ambiguity (Kraaijenbrink, 2018). All four represent distinct elements that make people's environment, the world, a market, an industry or the development of the individual, harder control and how to react on it. Volatility refers to the speed of change in the environment, Uncertainty refers to the extent to which people can confidently predict the future, Complexity refers to the number of factors that have to be taken into account next to the variety and the relationships between them and Ambiguity refers to a lack of clarity about how to interpret something. The new generations become prepared to thrive and still live in this world of flux in order to be ready, no matter what comes next. Students will to be taught to be creative and adaptable in both individual and collaborative settings.

E

A New Vocabulary on the Mental State

Within the attention society, the pressure to achieve constantly is huge among the young professionals and students. They experience a feeling of fear that everything they do, will still not be enough and there 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 brings with its innovations (van Eijck et al., 2016), mental challenges of individuals have been getting more attention. As stated in the other cluster of The Ongoing Self-development, coming generations will cope with challenges during their development and transformation with failure, feelings of high-pressure, competition and making face-to-face contact (Kamp, 2020) (Price, 2020).

The competitive labor market does not make this easier, after young people graduate, they have the tendency to attend online courses and traineeships in order to make their profession or job more unique and relevant (LERU, 2019), because they have the feeling 'they have to'. This competition is fed by the automation of jobs and people's fear of being replaced (CBS, 2019). Robotization and the automation of society make many human actions unnecessary what can lead to more unemployment. People will always feel vulnerable, but with new technologies, the sharing economy and the use of IoT, privacy, safety, and quality of life for the individual experiences more pressure and stress (van Eijk et al., 2016). The overload of information is already overwhelming for fresh starters. Too many options or information available ensure confusion when making a decision. For education, the combination of the technologies and the pressure of making life-choices, the role of the teacher it will change into a coaching role, that not only supports the learning process but also the personal development of a student's life. Mental health becomes first, aiming to prevent mental illness and burnouts (OECD, 2020).

"High accessibility offers too many options that causes stress and confusion."
- Margenau, 2016

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. This also applies for universities, where students experience the same feeling of high pressure and the mental well-being will one of the university's main responsibilities (TU Delft, 2019). When students step out of their faculty bubble, they often experience a lack of resilience (Price, 2020). During internships and graduation projects, students already experience 'mood-swings' whether they can handle it.

The feeling of failure is fed by the constant stream of expectations, perfect role models and gaps between the real-life work and the academic side (Scholtes, 2020). 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 ill-nesses and deceases. Going offline moments will become more important to keep a healthy mind. Educational educations aim to offer safe spaces where students can be empathetic and supportive when sharing their experiences and struggles, and where they can talk and write about what has been learned.

The Modern Purpose

Challenges like climate change and declining biodiversity, sustainability have created 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. The illusion of gaining back control in the world, requires more thought among people and people have been undergoing changes in their behaviors. Different buying behaviors have been developed that are focused on sustainability and recycling (van Eijck et al., 2016), especially among the younger generations which are more interested in using products than owning them. Also challenges like new energy transitions, health care, dealing with poverty and the strive for equality are getting more attention among younger generations who are not afraid to let their voice heard (Machado, 2020). Students, graduates and professionals find purpose in the development of innovative solutions that are driven by societal challenges (Klaassen et al., 2018).

As the future challenges have to deal with everyone on the planet, people develop a deep desire to contribute to the understanding of complex problems in both working and private life (Voûte et al, 2019). Designers will come up with solutions that will inspire new, sustainable long-term behavior among people.

"With my designs, I want to make impact and change the behavior of people into a more responsible, sustainable one."
- IDE student, SPD MSc. Student, 2020

In the future, professionals are striving for more from their job than just a paycheck (Gaskell, 2017). Motivation, ambition and initiative will be of great value when taking risks. In order to trigger the modern purpose of younger generations, role models can be used (Kamp, 2020) during their education, which is seen as a preparation for the real world. The new, working generation is entrepreneurial, responsible and will thrive innovation in companies, non-profit organizations and startups (IDE, 2019).

People do not hold on anymore to old habits, in order to find innovative and multiple solutions for the challenges they face in daily routines or during their job. People are prepared to look for other ways in order to contribute to the bigger picture (OECD, 2018) and adapt the traditional methods. Developments in 'design thinking' reflect these purposes, for example 'design for the circular economy' that looks at extending the life cycle of products, systems and components before looking at the material first (van Eijck et al., 2016). Design methods will be iterated, adapted constantly and combined. Design will take on a much broader use and applied in industries that did not used design thinking at first (Voûte et al., 2018).

E

Beyond Walls

Technology enables people to behave like ‘digital nomads’: they can work, study, communicate and collaborate at any time, wherever they are (Reichenberger, 2018). Digital nomads are portrayed as young professionals working solely in an online environment while leading a location independent and often travel reliant lifestyle where the boundaries between work, leisure and travel appear blurred. With the blurring boundaries in our world that is replaced by a network, the sharing economy is at its highest. Products become part of product-service systems and human-to-human services use digital technologies, that enables the sharing economy (Voûte et al., 2018).

“The time before the web is a very distant memory, one that’s been eviscerated by the ubiquity and life-changing impact of connected technology.”
- McCarthy, 2017.

By 2030, people will not be limited anymore by their disabilities, knowledge, profession and location (Accenture, 2020). As people are constantly connected, we have the ability to work, collaborate with everyone and communicate at any time. Distance between countries will fade but also lines between professions, private life, science and academia (Castells, 2004).
Access have become more important than owning (Gidopoulos, 2019), all because of the unlimited opportunities that the network of internet gave us. Younger generations want to be exposed to the all actual challenges and advancements of the industry, the modern university goes beyond its walls by offering more self-directed, project-based curricula with flexible and innovative classrooms, which can be taught as challenge-based learning methods (Smulders, 2019). A challenge-based learning supports the learning that takes places through the identification, analysis and design of a solution to a sociotechnical problem. It is typically multidisciplinary, in an international context and aims to find a solution, which is environmentally, socially and economically sustainable (Malmqvist et al.,2015). Challenge-based learning experiences raise the level of difficulty of the problem (addressing “societal challenges”), are inherently multidisciplinary but without knowing what disciplines are needed prior to project start, and often have the stated aim that solutions should not only be proposed, but also implemented.

Design professionals are entrusted with more complex and intertwined challenges (IDE,2019). Designers have to go beyond their own discipline, just like other professionals to work with these challenges. Students will have access to a broad range of different kinds of disciplines, courses and knowledge, that are 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. Not only the possibilities of learning are getting broader, design will take on a broader perspective too. A designer is able to adapt to multiple industries and create meaningful designs and is stimulated to empathize with professions that are beyond the design discipline and the and the ‘safe place’ of their own profession.

Equivalent Collaboration

The future society has the desire to create equal opportunities for everyone at every level where the value of individual is recognized and respected. Also, governments are setting rules against inequality in the workplace as in education opportunities, where everyone should be valued as a diverse individual and handled equally (Rijksoverheid, 2020). In the coming future, people will still be fighting against discrimination on the basis of ability, age, class, religion and language and ethnic origin. The high connectivity of the world with online platforms, offers people a voice, but also the chance to put everything into question when it is about equal chances.

Globalization and new information technologies have resulted in increased competition, increased mobility of skilled workers, and consequently shorter product life cycles, smaller profit margins, and higher risks (Du Chatenier et al, 2009). To stay in business, companies must spread risk and must innovate and develop new products and services, at a high speed and on an efficient scale. This also includes the growing interdependence of other companies’ know-how. Collaborations and open innovation spaces will be increasingly important in the future (Du Chatenier et al, 2009) in forms of multidisciplinary teams and open innovation spaces.

“The know-how of other companies, like tech companies will become more important just like our know-how to others. We have to bundle our powers more to keep up and tackle the challenges of the future.”
- Employee in Health care

There is a need for more creative connections between different scientific fields, and for increased cooperation and crossovers with the industry and societal institutions. For the complex challenges that professionals will face, creating solutions of the future will include teams that consists of multiple disciplines. This will bring the best together, aiming for the highest impact by valuing the diversity of teams (van Eijk et al., 2016). The networks people are living in enable these diverse collaborations, where the difference between professions from all over the world and increases the understanding of other perspectives and opportunities of a societal challenge (Knippenberg et al, 2007). With collaborations, people will increase their opportunities of learning by learning form others around them to get a broader perspective of other disciplines and knowing how to complement where needed. But with everyone having a different background, experience, age, profession focus, miscommunication, feelings of harassment and having different working ways cannot be prevented.

Transparency and inclusivity become more valued in order to increase trust within teams (Buß, 2020). A negative relation between a strong hierarchy and knowledge creation was found, because a strong hierarchy appears to inhibit a constant flow of communication and ideas (Du Chatenier et al, 2009). Hierarchies will fade within collaborations, but also within the organizational structures of companies: Employee ownership where everyone is valued the same way, and more and more companies look into such models (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 prepare students more for the future world of equal collaborations, beneficial collaborative experiences will be stimulated between different study backgrounds, but also with companies outside university.

“Collaborations between multiple disciplines can improve the social skills of the design students more.”
- Ana Valencia, Dr. ir, TU Eindhoven

The diversity of organizational backgrounds in multidisciplinary teams may be a source for creativity but can also be a source of social and communicative dilemmas resulting in conflicts. For the professional designer, communication and collaboration with other designers and non-designer stakeholders is often claimed to take up the most of modern design work (Voûte et al, 2019). Connectors will be needed (Voûte et al, 2019) to stimulate mutual respect and combine and backgrounds to build a strong foundation for collaborations between people, companies and industries. For professionals, in this case designers, it will always be a challenge to work with non-creatives that are not familiar with design methods.

F

f

Practice descriptions

Practice #1 – SELF-DETERMINANCY

organized complexity / the ongoing self-development

“I have the need to communicate who I am as a designer.”

The high-pressure of the organized, complex society forces people to behave to a certain standard and create an identity that fits in the ‘perfect image’. In the future, digital presence becomes of high relevance in the development of a student’s personal identity. Students feel restricted by the expectations of the complex society in developing their own identity and who they become as a professional. As a response, students become resistant against meeting expectations and comparing themselves with the ‘perfect’ lives of others.

When choosing to become more self-determined, the more doors are able to be open. Just like the broadening role of design, the definition of the competencies of a designer or the formulation of what you can do as a designer is perceived still to be difficult. To communicate themselves to the outside world, IDE students have the need to have the tools to communicate themselves to the outside world. The definition of design in the business world is still not fully understood, which causes a reaction of designers being closed in their own bubble. Not knowing how to communicate what you good at, or have the feeling people will not understand even if you would try, cause feelings of being lost and stress and a low self-esteem and will of bad influence in the development of the personal identity of the designer.

Mission Statement
IDE wants students to become confident in guide themselves in the communication of their skills that supports the development of their own identity by empowering them to take back their personal authority.

Practice #2 – INDIVIDUAL FOCUS

equivalent collaborations / the ongoing self-development

“I want to create my own moments of achievement.”

In the future, products or services may never be finished, there will always be iterations and room for improvement. Where millennials were seen as perfectionists and always want to be better than others, the next generations will be about authenticity, equality and the genuine journey of self-development. Working hard is still important but will not the only driver for success. In knowledge-based societies, lifelong learning is important, and people feel it is crucial to learn and develop continually. In the future world of multidisciplinary collaborations, professionals have to be aware of their own development and create a resulted oriented mindset for themselves. Where to focus on as an individual within and outside education is a real challenge

When education becomes more focused on life-long learning, more process focused and maybe an increasing time span of your education, students have the need to create their own decisions and moments of achievement that contribute to the well-being of students resulting personal goals and awareness of own abilities. When going outside the faculty, knowing how to make your own choices in life, being happy and confident contributes to the multidisciplinary collaborations designers face. Not knowing how to make decisions for yourself will cause anxiety when you have to make those. A feeling of achievement in life can ensure inspiration and motivation.

Mission Statement
I want students to be able develop their own moments of achievement in the never-finished processes of life by developing a mindset that supports balancing individual growth in the collective that is good for the well-being of both.

Practice #3 – USING TECH TO UPDATE

technology take-over / the ongoing self-development

“I have the need to adapt myself constantly and fast.”

Students compare the feeling of being a steady learner with being restricted by the curricula of universities. As a response, people want to personalize their own development with the aid of technology, which results in a high amount of learning opportunities and the ability to learn at an ongoing pace. Broad and opportunities for self-development triggers the motivation to become as relevant as possible as a professional.

In the future, due digital transformations and quick innovations in the working field, learning becomes more temporary and the durability of skills will decline that make people develop a short-thinking approach. Constantly learning short-term skills will be seen as the most effective way to respond to the technologic innovations and changing job descriptions. Learning will be about learning skills fast where the time to make deeper connections declines. Education will be seen as a is a quick way to fight the anxiety to be replaced caused by the technological innovations.

Mission Statement
IDE wants students to feel ready for a future where self-development is an iteration on current skills that last for a lifetime instead of short-term skills by empowering them to become responsible in their adaption to technological transformations.

Practice #4 – MAKING DESIGN DECISIONS

organized complexity / a world in flux

“I want to satisfy everyone.”

In the future, we go from cities that never sleep, to a world that is always awake, students have the feeling they have to go on and on. Solutions in people’s daily lives are digital, on-demand service systems with many components and actors. With the broadening information network, high pressure society with its high speed, making decisions takes a higher level.

The decision-making process becomes more advanced and chaotic, with and a lot of things that depend on it. Already in their education, students become insecure to make a decision for a design direction or a next step in life, as more stakeholders are involved, with more opinions and more possible ‘bad’ consequences. They become anxious to make the decision without even knowing the outcome. The role of the educator will change to a supporter of decisions in both professional and life.

Mission Statement for possible design directions:
IDE wants students to be able to create room for failure when making decisions in both personal and professional life by allowing them to be confident in the process of turning fear into opportunities.

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Practice descriptions

Practice #5 – SHARING DESIGN
equivalent collaborations / a world in flux

“I want to recognize people who understands me.”

The fast pace of innovations ensures a constant stream of changes. When something changes, people feel vulnerable and are looking for ways to find reassurance and confirmation with others. However, in the working place, it becomes a harder task to find those people who understand you, as everyone deals with their own problems. In order to deal in the future world of flux, talking about experiences in order to process and understand them becomes more crucial. Sharing a good or bad experience with others will support both the understanding and learning of an experience. As sharing experiences will be a means to create a sense of belonging and equality, it is also a way to become vulnerable.

IDE students have the urge to keep things for themselves. However, the future settings of collaborations forces students to share their experiences in a way to cope with the world of flux. Communicating good or bad experiences will be more helpful to others but also for yourself. Moreover, it gives a realistic perspective what is happening right now, next to thinking collaboratively to the solution. Within the design process, the road consists of many ups and downs, where often the downs are not shared. However, sharing the downs also, can ensure that it won’t happen again, or it can give a design project a new insight. However, sharing the negative ones is still seen as a taboo as people communicate most of their positive experiences with the outside world. The high-pressure society next to the competitive environments of design makes a design student anxious of sharing their experiences with the others around them, especially in teams with people you do not know.

Mission Statement:
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 design practitioners.

Practice #6 – MAKING TECHNOLOGY HUMAN
normalized technology / a world in flux

“I have the need to make meaningful connections.”

The high speed of the integration of technology in our daily life’s routines and decisions supported by the algorithms, make people demand to disconnect from it and go back to the ‘old ways’ of interacting. Students find themselves in the conflict between human and technology. Emotions and feelings allow people to make deep, on-demand connections and empathize with each other, an ability that robots do not have. Design will be seen as a tool in order to connect with the real world, getting in contact with the people and why behind technological innovations. Design students struggling in understanding the newest technologies as new ones keep arising. To gain this understanding, collaborations between technology and the people behind it will be stimulated more in their education towards a design professional.

Mission Statement for possible design directions:
IDE wants students to experience an understanding of new technologies and are able to integrate them in human lives by allowing them to collaborate between those worlds.

Practice #7 – OWN WAY OF DESIGNING
organized complexity / beyond walls

“I have the need to use everything I have learned.”

Designers have the ability to use design methods that support them staying creative and outside the box thinking. Students learn how to use different perspectives and make unexpected combinations for unique solution directions.

In the future of design education, with the high access of information and complexity of challenges, design students feel the necessity to make use of every kind of resource and take every experience into account. Finding the sweet spot of innovation is becoming more exhausting and a decrease in feeling of epiphany after finding it. Going through the design process becomes a struggle between keeping structure of all kinds of insights and the pressure to come up with innovative, unique solutions.

Mission Statement:
IDE wants students experience the space beyond their own knowledge by empowering them to develop their own way of designing.

Practice #8 – LEARNING BY COLLABORATIONS
equivalent collaborations / beyond walls

“I want to have the feeling that I am useful and valued.”

In the future with more multidisciplinary projects and open innovation teams, every team member has to go beyond the limits of their own knowledge while collaborating with people from different backgrounds in order to reach a sense of common knowledge, inclusivity and equality. As a result of the increasing awareness of the benefits of design, designers will be involved in multiple, maybe unexpected, industries. It becomes the responsibility of the design student to integrate the design thinking methods into the team, but also learn and adapt the process to the abilities of others.

However, the design thinking process can be both vague and overwhelming for people who are not used to work with designers or within the process and also want to contribute in their way. Also, a design student alone in a multidisciplinary team increases the difficulty of the challenge as well. As a response, other team members experience feelings of frustration, become resistant against or get less motivated of the use of design when thinking of innovative solutions. Both parties, the designer and the non-designer, will develop feelings of misunderstanding in working ways that will grow in the resistance of working together.

Mission Statement:
I want students to be recognized as both designer and team player 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.

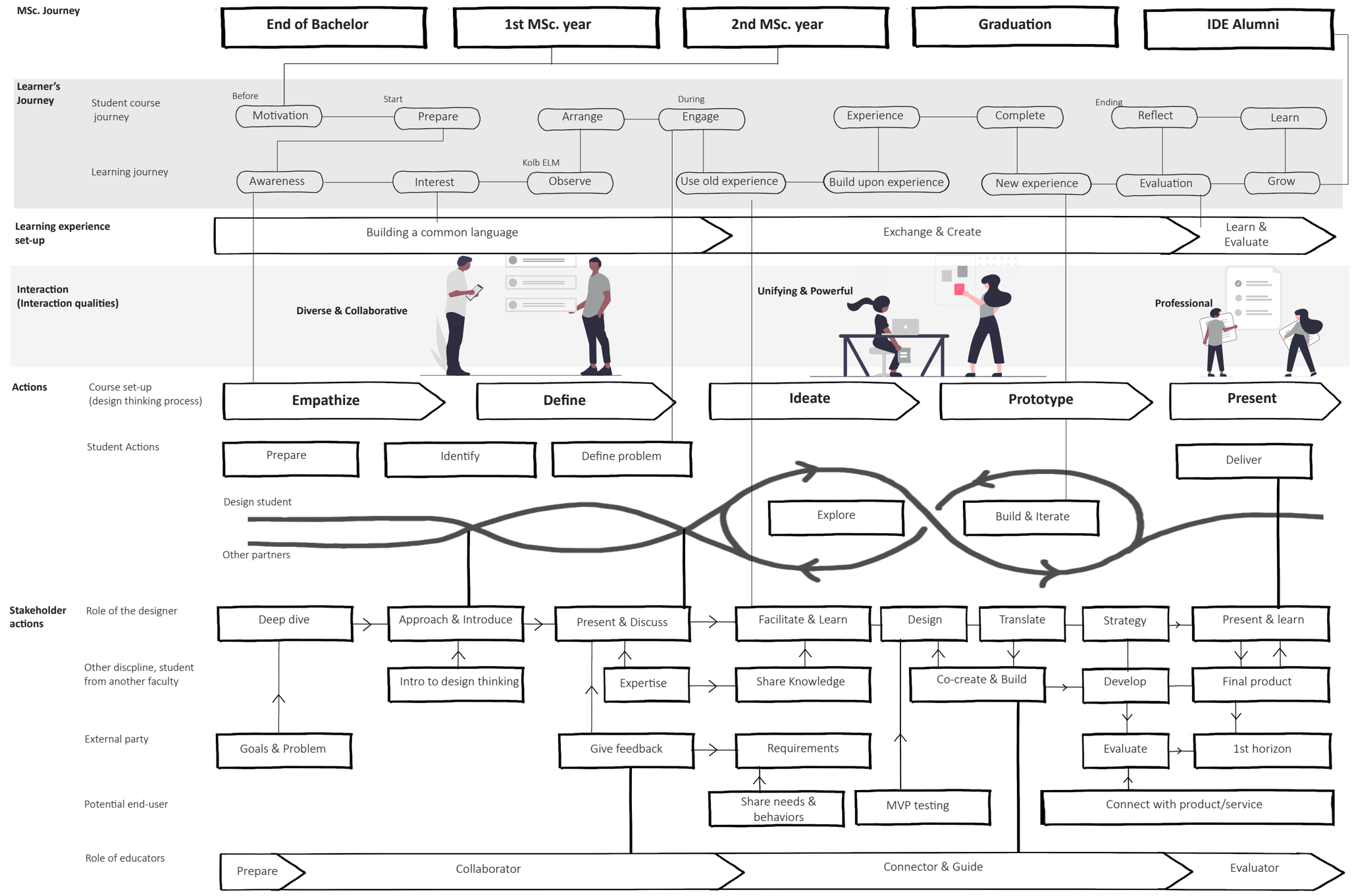
Practice #9 – USING TECH TO UNIFY
normalized technology / beyond walls

“I want to be connected to people that bring the process further.”

The online presence of universities will continue to evolve and grow and will have an effect on the act of teaching, learning and conducting design. Design students will act like digital nomads within the online network. Learning is seen as something unlimited that you can do without moving. However, both online education and collaboration requires students to be dedicated, motivated and responsible in their own learning. Just like in the real world, students have to be resilient to step out of their comfort zone online. Curiosity is needed in order to make connections with people, professions or industries that outside the walls of the faculty.

Mission Statement:
IDE wants students to be able use the power of the collective by empowering them to make connections with people outside their comfort zone.

G
g Addition to Concept 3



H Project brief approved

DESIGN FOR our future

4421

TU Delft

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !

family name: Willinge Gratama
initials: BM given name: Bente Mathilde
student number: 4457528
street & no.:
zipcode & city:
country:
phone:
email:

Your master programme (only select the options that apply to you):

IDE master(s): ( ) IPD ( ) DfI (★) SPD

2nd non-IDE master:

individual programme: - - (give date of approval)

honours programme: ( ) Honours Programme Master

specialisation / annotation: ( ) Medisign ( ) Tech. in Sustainable Design ( ) Entrepeneurship

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair: Giulia Calabretta dept. / section: CMR

** mentor: Sylvia Mooij dept. / section: CMR

2nd mentor:

organisation:

city: country:

comments (optional): Both members are selected in the same section, but they deliver each a unique value based on their role in IDE and expertise (Sylvia is on communication and Giulia on strategic design).

Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

Second mentor only applies in case the assignment is hosted by an external organisation.

Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

TU Delft

Procedural Checks - IDE Master Graduation

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

chair: Giulia Calabretta date: 11 - 09 - 2020 signature: G. Calabretta

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: 36 EC

Of which, taking the conditional requirements into account, can be part of the exam programme: 30 EC

List of electives obtained before the third semester without approval of the BoE:

(X) YES all 1st year master courses passed

( ) NO missing 1st year master courses are:

name: C. van der Bunt date: 14 - 09 - 2020 signature:

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: (V) APPROVED ( ) NOT APPROVED

Procedure: (V) APPROVED ( ) NOT APPROVED

title should be: *Developing* new learning experiences for IDE *students*

comments

name: *Monique von Morgen* date: *29-09-2020* signature:

TU Delft

Personal Project Brief - IDE Master Graduation

New learning experiences for IDE — project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date: 07 - 09 - 2020 end date: 19 - 02 - 2021

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

The context of this project lies in the field of design education and learning experiences of students at the faculty Industrial Design Engineering of the TU Delft. At the IDE, design thinking methods are developed and educated to students. Students here, have the opportunity to learn a wide range of design methods and reflect on them, educated by passionate educators.

Today, the accessibility to information is becoming higher due to all the technological and digital innovations. We are able to communicate more broadly than ever and find the information and skills we need as quickly as possible causing in a change in the way we, the students of today, learn. Students are able and willing to learn faster, learn more and develop ourselves broader with multiple skills. The world of education has to follow these new innovations and the changing needs of learners. The development of new learning experiences will become relevant which are more unique with a focus on the experience of learning instead of doing 'tasks'. Moreover, due the COVID situation, this digital shift towards more digital learning / education has been accelerated. The learning industry is about to change, will IDE be ready?

Main stakeholders of this project are the design students of IDE and it's educators. Design students are a unique set of students who do not always benefit from reading outdated textbooks with old technologies and memorizing definitions to pass a multiple-choice test, they learn by going through design processes over and over again and 'just do it'. The educators of IDE contribute to this 'learn by doing' learning experience. However, as the way we learn and our needs change, it becomes necessary for IDE and other universities to look at other learning experiences they offer their students. How to create courses that are relevant to the topics of today and make the experience of learning usefull and unique? It is time to look at other opportunities to innovate our ways of learning and education and look at the need for new solutions in this rapidly changing world.

During this project, there will be looked into the ways we learn next to learning experience design (LXD) methods to develop ideas for new learning experiences at IDE. LXD is a process of facilitating the development of skills (expertise, proficiency) by providing learners with a systematic set of learning activities (experiences) supported by content, feedback & technology [1]. A promising educational approach is Collaborative Learning: Educate and learn at the same time with the aim to generate knowledge together and facilitate the learning of students. It involves groups of students working together with their educator and maybe other stakeholders to solve a problem and find the right design solutions. With this approach, both educators and even organizations can benefit from this collaborative education: every participant becomes a learner.

Challenges to take in mind when developing ideas for new learning experiences are, first, keeping the relevance of the learning experiences keep up with the changing needs and the ambitions of the students of today. This indicates the need for strategic thinking and trend research when developing these new ideas. Also, estimating the value for external contributors / organizations and the alignment between different expertises and know-how of educators when thinking about ideas for new learning experiences, from challenges in this project.

[1] M. Rosenheck, 2015. Becoming a Learning experience designer.
https://www.slideshare.net/MartyRosenheck/becoming-a-learning-experience-designer

space available for images / figures on next page

Personal Project Brief - IDE Master Graduation

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

The scope of this project lies in the field of design education and new learning experiences for students. It is important to closely research opportunities to create inspiring ideas for new learning experiences and eventually, make them more concrete. In line with this, it is relevant to gather information from other similar universities and organizations that are also involved in the same field of design education or creating new learning experiences .

As said before, at IDE, there is a need for new learning experiences, but the problem is that there is a lack of ideas, time and knowlegde on how to create them and implement them. There is a minimum time left for implementing new innovations in the current curriculum and in the learning experiences of today. Moreover, due to the high accessibility of online courses and information, how can IDE still be relevant and offer better learning experiences than they do now? Within this project, it is researched what strategy or innovation in addition to the current learnig ways could make sure that a new learning experience idea can ensure better, relevant learning of students. Through an extensive student and context research, which means investigating other learning and teaching ways from other universities and organizations, ideas can be developed and tested.

Next to looking at current and new ways of learning, it will be interesting to take a closer look into the needs and ambitions of the students of today and uncover reasons for how they learn, their ambitions or what they like or do not like about their current learning experience at IDE. To improve the learning experience of students, educators should be brought together and interviewed, as they are always involved in the learning experience of students.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

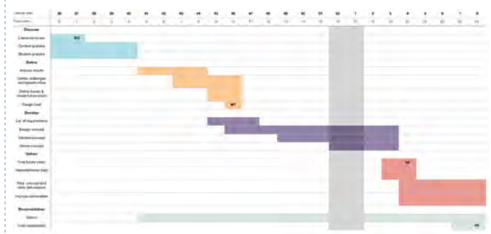
This project aims to research different perspectives about ways of learning together next to future trends and innovations in education that fit the needs of all stakeholders involved (student, educator and organizations). In the end, concrete ideas for new (collaborative) learning experiences at IDE will be developed that fit the most relevant needs and innovations within design education and learning.

In the sake of this project, IDE will be the client. After performing a broad analysis in (design) education, and being focused on how students learn and how the educators educate, students' needs and ambitions and current learning experiences, the most important guidelines that IDE needs for innovating the learning experience will be discovered. These guidelines can form a basis for further research for developing unique, (collaborative) learning experiences that fit the innovations of today. Concrete ideas for those learning experiences will be delivered that combine a strategic perspective on the direction IDE should head to maintain relevance and offer students a unique learning experience.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 7 - 9 - 2020 19 - 2 - 2021 end date



The planning of the project is based on the double diamond method. In the discover phase, the focus will be on analyzing current learning experiences and trend analysis in the field of (design) education and IDE. It is important to keep the needs and ambitions of students in mind, done by interviews and generative research methods. The result form relevant innovations in design education for developing new learning experiences that fit the needs of all stakeholders. After this phase, the design brief will be defined and the final problem definition is formulated next to the first list of requirements for the design for a new learning experience. The midterm presentation will offer a summary of these two phases.

In the development phase, the first guidelines on how to design for collaborative learning experiences and first ideas will be developed. These can be tested and validated through an'built, measure, learn' loop . After the Christmas break, the last iterations will be done before the Greenlight. The last period, final ideas will be made concrete and supplemented with an implementation plan.

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

Teaching and coaching have always been a passion of mine during the last years. When I was looking for graduation opportunities, I was looking for the perfect combination of my passion and background as a strategic design student. I am curious about how to use strategy and innovation methods next to the traditional way of learning of students and develop new courses that are 'prepared' for the future which lies ahead of us.

After doing an internship as projectmanager of strategic projects and UX sessions, having built my own startup and experience as a student teaching assistent at PO1, PO2 in the bachelor, I want to prove my competences to come up with coherent and well thought learning experiences that is well planned with a strategic vision in mind. At last I would like to use my critical mindset to dive deeper and get to the bottom of finding out what fits the learner's needs when it comes design education.

In line with my motivation for my graduation project, there are several learning ambitions I want to develop and learn about when graduate at the TU Delft where IDE will be the client. I would like to learn more about teaching and learning methods available. I want to learn how the learning experience influences the motivation of students and how we can use innovative design methods to improve them. It will be interesting to look at other instancies (universities or similar organizations even outside the Netherlands) how they teach and what their perspective is, an example is the the Industrial Design Faculty of the TU Eindhoven or one of our exchange universities. I want to learn how courses are set up, plannened over time and look for opportunities to improve the efficiency of them. In addition to this, I would like to further develop my interviewing skills and find a way on how to get the most information out of people.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

The overall project will take a bit longer as I will be engaged as a student-assistant during Q1 at PO1. This choice was based on the fact that I wanted to be more active in the field next being a graduate student in this field. I think this will give me energy and a network of people with who I can discuss the project. Therefore, in Q1, one day I will be occupied with PO1 and the other four will be reserved for the graduation project.