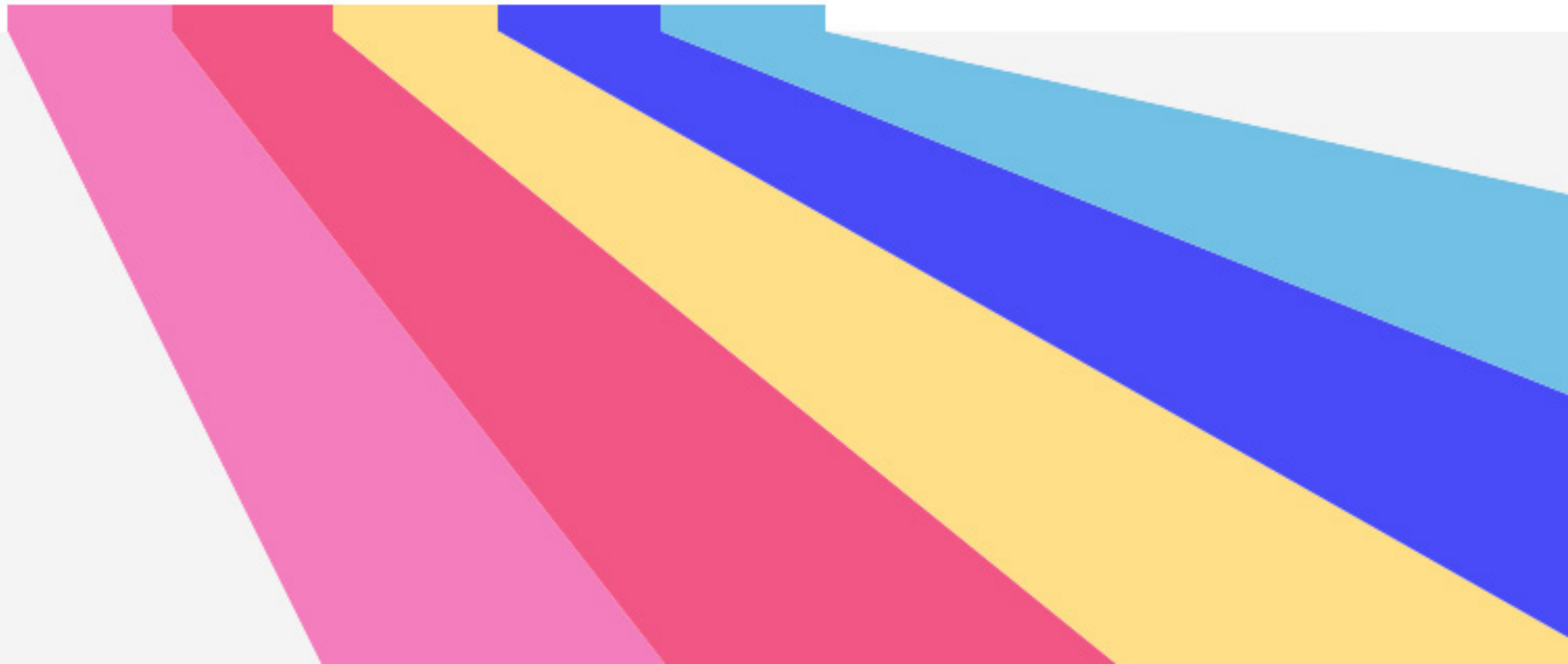# AWARENESS & INCLUSIVITY OF GENDER IN DESIGN EDUCATION

How can knowledge & awareness on inclusive design and gender implications be created for designers in an educational setting?

TU/e

Abstract

Sensitive topics like non-binary gender identities are becoming increasingly more prevalent in society. However, design is still far away from being fully inclusive, and designers are lacking the knowledge, awareness, and guidance on these relevant topics to enact positive change.

This project aims to create more knowledge, awareness, and inclusivity on non-binary aspect and implications in design and design education, in order to eventually see positive change in society as well. To create this knowledge and awareness, a platform was created that introduces students to the topic of non-binary gender identities. Moreover, the platform provides students with a set of guidelines to implement the obtained knowledge and awareness, and also provides them with additional literature for further reading into the subject. Students were asked to fill in a questionnaire after experiencing the platform in order to determine the success of the project. Afterwards, a thematic analysis method was used to analyse the data from the questionnaire.

Results suggest that the platform was successful in its ability to provide students with the knowledge, awareness and guidance they need to create more inclusive designs. This paves the way for the future development of the platform, and more inclusivity in design and society.

This project concludes with several ways of growing the existing platform in the future, and emphasises that designers in an educational setting should obtain increased non-binary, genderqueer and genderless knowledge, awareness, and guidance to increase inclusiveness in design and society.

Table of Contents

Introduction

Gender and identity have become emerging and relevant topics over the past few years, with terms like non-binary, genderless, and genderqueer being implemented increasingly more in our daily lives. Examples include, but are not limited to: More gender-neutral toilets; more mainstream fashion brands introducing genderless clothing; and the Dutch Railway services switching from 'ladies and gentlemen' to 'dear travellers' in announcements.

Non-binary is an umbrella term that refers to individuals who do not have a gender identity that falls exclusively in traditional binary opposition such as male and female. Thus, Non-binary individuals define themselves as neither exclusively masculine nor feminine. These individuals could either have their gender fall on a spectrum between masculine and feminine (e.g. genderneutral), feel elements of both (e.g. genderfluid), or experience their gender as different from either (e.g. genderless) [16].

Non-binary and third genders have existed for quite some time; Hijra from South Asia dating back to around 400BCE, Scythians who were Eurasian nomads, Two-Spirit Native Americans, Māhū of Hawaii and Tahiti, pre-colonization, etc. [9, 11, 26]. However, binary (either male or female) aspects are tightly woven into everyday life, non-binary genders are still vastly underrepresented in current day media and design, and design is still far away from being all-inclusive. This is detrimental to a fully accepting society for all, where each individual is able to both be their authentic selves and fully express themselves. Thus, a true non-binary society in the future is something that needs to be actively cultivated.

Studies also show that non-binary individuals are of more sizeable proportions than some might realise [12][15], but little attention has been focussed on this absence of representation. This underrepresentation could lead to harmful biases and discrimination [3], psychological distress [2, 20], or even gender dysphoria [6, 14]. While existing work on gender highlights problematic gender-specific views in various design fields, none have yet explicitly focussed on non-binary implications for design or designers. The lack of knowledge and inclusion of gender in design has been mentioned in some works [10, 14], but marginalised groups like the non-binary currently serve little interest to designers or researchers in design. This is simply detrimental to a fully inclusive society. Designers dictate what—if any—aspects of these topics are implemented, as design is a major influence on society and our daily lives. An example that highlights this problematic lack of awareness can be found at the TU/e within the Industrial Design's Health squad.

The Health squad, which focusses on creating interactive products and services that have an impact on the mental and physical health of individuals refers to any individual that can become pregnant as a woman. However, a large variety of people have reproductive organs or wombs and thus have the ability to get pregnant. This is not just limited to women. I believe that this binary thinking in design will be faced with an uphill struggle. Designers directly influence what solutions to what problems are created, what those solutions and thus society looks and feels like, etc. With this responsibility of shaping society comes a certain (social) responsibility, however. In order to be fully able to design for our modern-day society, designers need to have a certain awareness and knowledge on gender.

Previously conducted projects on gender within design have shown that designers are lacking the knowledge, awareness and guidance on relevant and delicate topics like the non-binary to make a real, positive, and large-scale change [4, 5]. Therefor, it's important to create this knowledge and awareness on gender implications and aspects in design. Erhnberger, Räsänen, & Ilstedt (2012) put it as such; "We as designers must become aware of our responsibility and our power to make a change. . . . [H]ere, the notion of gender plays a significant role." [8].

Thus, this project aims to provide designers in an educational environment with the knowledge, awareness, and guidance they need in order to create more inclusive designs.

Background Research

Designers might not realize that through their work, they are negatively contributing to the problem of gender in design. Take for instance the social app 'Giggles' which allows users to come together in an online community of women. Before being able to use the app, however, users need to pass a right of passage. As a form of being verified on the app, the app analyses the bone structure of users in order to determine their gender identity. This verification system has received very strong critiques for being based on biometric (facial) recognition technology which does not work for transgender individuals [21]. Which, in contrast to the app's name, is no laughing matter.

Another good example is current day smart home voice assistants. West, Kraut, & Chew (2019) point out that most leading voice assistants today are exclusively female or female by default. This includes both name and sound of voice [27]. Amazon's Alexa, Microsoft's Cortana, and Apple's Siri all have female names. While Google's voice assistant, named the Google Assistant or Google Home, does not have a female name, it does have a female voice. This is problematic not only because of how this could translate to societal expectations for women [17], but also because it grounds a binary view on gender in society. A work by Strengers & Kennedy (2020) echo's this sentiment on gendered devices, stating that the design of gendered devices reinscribes outdated and unfounded stereotypes onto society, taking us backwards on gender equity [24].

Results from previous projects I've conducted on gender go hand in hand with these examples of problematic binary design that are scattered throughout society, as they highlight a lack of knowledge and awareness on the non-binary and genderqueer. The results show that a high percentage of participants had no previous knowledge on gender, but also indicating that they had no problem with a fully inclusive (non-binary) society. Participants also did not initially know the difference between gender and sex, and continued to confuse the terms even after explicit explanation of the difference [4].

Results also show that generating awareness alone is not enough, and that designers (in an educational setting) need more guidance in order to positively impact gender inclusivity in design and society [5].

Studies, projects, and work in connection to gender in design highlight valid concerns that everyday practices are highly gendered, and that the industry is suffering from a lack of gender diversity [18, 19, 24]. Bardzell (2010), for instance, gives a critical outline of her vision for feminism in different design fields. She believes feminism provides opportunities for designers, including feminine approaches to design [1]. Søndergaard and Hansen (2018) present gender issues through a feminist design methodology, and argue that our perspective on design and life is interwoven with gender issues [22].

However, West, Whittaker, & Crawford (2019) explain that the diversity problem is not just about women. It's about topics like gender, race, and most fundamentally about power. This power affects how companies operate, what products are built, who they are designed to serve, and who benefits from their development. The authors also highlight the pushback against diversity in design. Demands for inclusion and equity, together with a growing awareness, have led to some change. However, the authors state that "there has also been resistance, especially among those implicitly privileged by the status quo." [28]. In their essay, Chatterton and Newmarch (2016) state that sometimes, intentionally or not, certain social groups (identifiable by for instance gender, class, race, etc.) are excluded from visions of the future [7]. The authors also make one thing clear, however: Business-as-usual is not an option.

Spiel and Keyes (2019) project their dissatisfaction of their rarely considered non-binary gender onto current day design by sharing their own experiences in their work. They have highlighted the casual violence that technology presents towards non-binary people, and present the HCI community with utopian 'bug fixes' that urge designers to do better.

The authors mention that "rather than take the easy way out when it comes to inclusion, we must embrace the complexity and plurality of existence. Only then will this fictional utopia—a utopia of conditions others take for boring and granted— turn into our everyday reality as well" [23].

A work by Haverkamp (2018) aims to increase knowledge of gender in engineering. The author calls for broader literature and awareness on gender in classroom and professional settings, and promts a necessary discussion around non-binary inclusion. The work concludes with several options for engineers regarding the discussion, reflection, researching and collaboration for gender inclusiveness [10].

The research shows that there is a lack of representation of non-binary and genderqueer individuals in design, which means that more knowledge and awareness could create opportunities for designers to be more inclusive. Slowly, designers are beginning to realise and argue for the importance of diversifying gender in design [13, 25], which pushes discussions into the right direction for better inclusivity. However, only initial steps have been taken and catalyzation of further inclusion within design is necessary now more than ever. A lack of knowledge and awareness in a field such as design is something that should be considered a problem, especially because it concerns so many individuals. If the topic of gender inclusivity within design is disregarded or forgotten, no fully inclusive society in the future is possible.

In conclusion, it is clear that a lot of work has already been conducted on gender in different design fields. However, the underrepresentation of non-binary gender identities within design is unmistakable. Designers in an educational setting need the knowledge, awareness, and guidance to create more inclusive designs. This project builds upon work and research that has already been done to further pave the way towards full inclusion of all gender identities within design. This leads to the following question:

How can knowledge & awareness on inclusive design and gender implications be created for designers in an educational setting?

Ideation & Conceptualization

Target Group

As was established in my Final Master Project proposal (FMP proposal), the target group for this project is designers in an educational setting. More specifically, the target group for the project was Industrial Design students at the TU/e. I chose this target group as I believe I can inspire the greatest change in them. They are my peers and colleagues after all, and I know this target group intimately. Moreover, I feel that I am able to emphasize with this target group accurately.

Guidelines

I understood that generating awareness means nothing without the potental for action. Thus, extra guidance would need to become a main part of the eventual product. This manifested itself in guidelines; simple, surface level rules that designers could refer back to when designing. These guidelines needed to be about the essential parts of designing with gender. Inspiration for the guidelines was drawn from the background research and the results of my own projects. The work of Spiel and Keyes (2019) was one of the main sources of inspiration for the guidelines, as they present the reader with a list of 'bug fixes' that urge more gender awareness [23]. The two authors identify as non-binary, which was another reason for relying on their opinions and written work. Another source of inspiratino was the Gender Theory Syllabus [30], which provides readers with modules to learn important aspects of gender with.

The guidelines had to—at the very least—tackle the following:
1. The difference between gender and sex.
2. The use of gendered language.
3. Handling gender identities of users/participants.
4. Gendered characteristics within design.
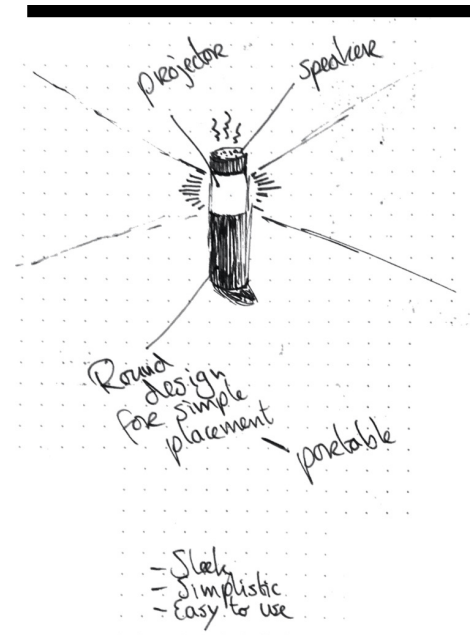5. Awareness on what a prototype can embody and translate to users.
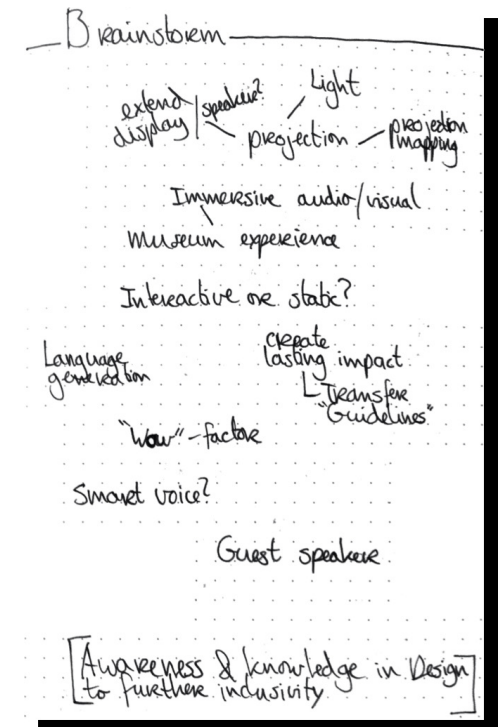

Figure 1. (top)
Sketch of the first concept: A portable 360° projector with speakers.

Figure 2. (right)
A 'brainstorm tree' created during the project in order to determine the best method of conduction.

As the guidelines requiered a medium through which to reach the target group, I began brainstorming (fig. 2).

As was mentioned in previous sections, I've previously conducted projects on gender within design. My last project was about the generation of awareness and knowledge within designers. The project helped designers to envision a genderless future through the use of design fiction. However, even though participants mentioned nothing of the sort, the final outcome of the project suggested that action potential was missing.

Thus, because of this previous project, I was inspired to create something that could generate not only knowledge and awareness but also action potential for my target group; A product that could succesfully relay this information, including the guidelines. My first thoughts were of an experience similair to the previous project. I wanted to create an interactive and immersive audible and visual experience contained within a portable device. The 360° projector (fig. 1) would be the medium through which students would communicate with experts on gender in design.

Figure 3.
A sketch of how the first concept could map projections in a usual classroom setting, including guest speaker.

The experts could also be present, at which point projection mapping (fig. 3) would be used to create a more immersive experience for the students.
Eventually, however, I decided to scrap this concept. The reason for this was that I felt it wasn't adequately addressing the problem of gender in design. A physical prototype would have the limitation of its presence only existing in one singular space, whereas a digital or online prototype could have the potential to reach more individuals in this case.

Tool

I brainstormed on a secondary concept, and what I came to was a tool. This tool would function as a digital experience which students could use during their design process. It needed to be something the students could refer back to, and which could succesfully contain and translate the guidelines to students. In the context of this project, I defined a 'tool' as such: A (digital) product that is portable, used to carry out a particular function or helps to do a particular activity. This function would of course be to provide the students with the guidelines, background knowledge and awareness on gender. The activity would be the designing or creating of a product or artefact. I imagined the tool to be available online for download, so that it would be available to students through any of their digital devices.

The tool was made up of a few sections (fig. 4). The first section of the tool focussed on the 'why'. It highlighted the importance of the tool and the generation of knowledge and awareness within design. It further discussed how designers were able to influence society positively, and that they had a responsiblity to do so as (future) designers.

The next section of the tool was the guidelines. As explained previously, the guidelines serve as basic, surface level rules to which students would be able to refer back to. Through a sideways swiping, users were able to quickly go through the guidelines. If a guidelines was unclear, or if a student needed more information, they could scroll down to read additional information on that specific guideline.
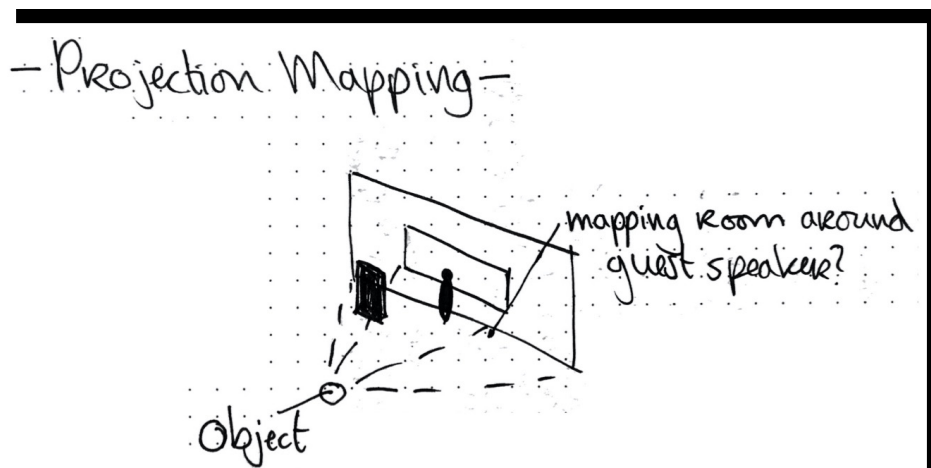
While the guidelines are a ruleset that serve as a handy starting point for introducing more gender inclusivity in design, the final section of the tool was implemented to make sure that students understood that just following the guidelines would not be enough to solve all of the complex issues concerning gender in current day design and society. It also highlights that as designers, the students should always remain conscious of these complex issues relating to gender.

Questionnaire

In order to test the effectiveness of the tool at that current point, I conducted a questionnaire. The questionnaire, including the tool, were sent to Industrial Design students at the TU/e. To be able to quickly and effectively analyse the data from the questionnaire, and to see general themes for improvement quickly, I used a thematic analysis method to analyse the gathered data. The questions and data from the questionnaire can be found in Appendix A: Questionnaire - Tool.

Results from the questionnaire are as follows:
All participants were positive about using the tool during their projects in order to improve them, with 82% mentioning that they thought the tool was a useful bonus to their design work. 73% of participants mentioned that the awareness and knowledge that is generated through the tool was sufficient. The other participants mentioned that additional information could never hurt. However, when asked specifically about the guidelines, 64% of participants mentioned that they liked the guidelines in their compact and manageable form.

Most participants were content with the provided information through the tool. However, some participants (33%) mentioned that additional information or literature might help them to better understand the subject, as the subject was new to them. When asked what could be improved about the tool, 36% of participants mentioned that adding more existing projects to the tool could help them to understand the expected outcomes better.

Figure 4.
Screens of the tool, showcasing the various guidelines, the why section, and the outro section.

Taking the feedback from this questionnaire, I began thinking of the best next steps. I knew that a tool could be extremely useful in order to create the positive change in design and designers. However, participants also mentioned that they saw potential for it to become something bigger than just a tool. Participants mentioned that extra information could be added, and that they would want more examples of correctly executed projects in terms of gender.

This led me to make the decision to warp the tool into a platform. A platform could be a place for students to not only reflect on their work as they would with the tool, but also to see succesful work from other students. The platform would be a source of inspiration, knowledge, awareness, and additional literature. I believe that the potential for a platform is far greater than for a tool. The platform was innately going to be something that was going to grow with time, whereas the tool would remain (mostly) static.

I defined a 'platform' in the context of this project as follows: It is not only an online space that gives me the opportunity to make gender known publicly (giving it a platform), but also a space that can be nourished to grow and be built upon. It servers as the 'kickstarter' or the foundation for many other projects like mine.

Eventually the idea for the platform is to become fully integrated in the online environment of the university. This would mean that the university's Intranet would be the host for the platform. Thus, the platform would be accessible for the university's students and network through their login credentials.

Figure 5.
Visual of tool in the imagined use, including the colour scheme.

Realisation

Based on the feedback from the questionnaire, I began dismantling the existing tool to see how I could incorporate its parts into an online platform. The existing sections of the tool served as a good starting point. The 'Why?' section could transform into a more general section of relevance and importance, where students would also be able to learn some important background knowledge on gender. The guidelines would remain the guidelines, with added information in order to clearly translate their meanings to students. Other sections that needed to be added were a seperate section on projects and a section on additional literature for further reading. I will highlight each section of the platform below.

As participants mentioned that they enjoyed the aesthetical qualities and colours of the tool in the questionnaire, I kept both and applied them to the platform. I felt that the colour scheme worked for the website, highlighting the important parts while keeping it modern and fresh.

Home

The home page serves as an overview of all of the different sections of the platform. It highlights the most important parts of the platform and has links to them. This page could also be used to share additional information concerning the platform, like maintanance and news update messages.

Importance

This section of the platform is highly important, as it conveys the overal importance and relevance of more gender inclusion in design. It also gives students information on the most important umbrella terms within gender, and visualizes these on the gender spectrum. I was inspired by the Myers-Briggs personality test [29] which groups people within sixteen different personality types.

Of course, each individual person has their own personality and there is no way to fully be able to show the spectrum of personalities today. Likewise, I focussed on the umbrella terms within gender. Not only to make it digestible for students who are new to the subject, but also because the spectrum of gender is as broad as that of personalities. I hope to make clear that the decision to include these gender identities yet leave others out was a difficult one. Gender is a sensitive topic, and non-binary individuals need anything but more underrespresentation. However, I understood that in order to clearly convey the spectrum of gender identities to students, I needed to highlight the most important terms.

I personally believe that there are an infinite amount of gender identities, I would even go as far as to say that every person on earth has their own gender identity. Of course, we choose a 'label' that best fits with our feelings in order to belong or be part of a community, and to understand ourselves. The list of gender identities is already long, and it's growing every day.

Thus, I implemented a disclaimer on the page that highlights the fact that the gender identities on the page are—by far—not all gender identities, with a link to a source containing additional information on gender identities.

Guidelines

The original guidelines from the tool were implemented in the platform as one page, giving it them a better overview, accessibility and usability. Like with the information provided on the Importance page, it was hard to balance the amount of information given with the information needed to positively impact design. I thus decided to limit the information given with the guidelines, as going too deep into the guidelines had the risk of deterring students new to the topic. This is especially true because of the previously provided information on the Importance page.

All projects

The project section would contain projects catered to the innovative field of (technological) design, as students have the biggest impact in this field. The projects displayed on the page would serve as icons; a point of inspiration for students. This section would also be the place where students would be able to share their own projects with others. This way, students could get inspired by their peers and colleagues' work. Because there are currently no projects created by students that implement all guidelines, the projects on the page are from outside of the university. In the future, the aim would be to fill the page with projects of students that have been checked on their implementation of the guidelines and awareness on gender.

Literature

This page contained the sought after additional literature. The participants from the questionnaire mentioned at multiple points that more literature would inspire them, especially if that literature was somehow linked to a project or interest of theirs. The literature that is available through the platform was handpicked by me. I've chosen the specific works because of their impact on my project(s). They all served as the major sources of not only information, but also inspiration and awareness. The original plan was to personally annotate each piece of chosen literature in order to provide students with a better understanding of why a specific work was chosen. However, after speaking to various non-binary individuals, I decided to withhold my personal annotations on the additional literature. I will eleborate on this decision later on.
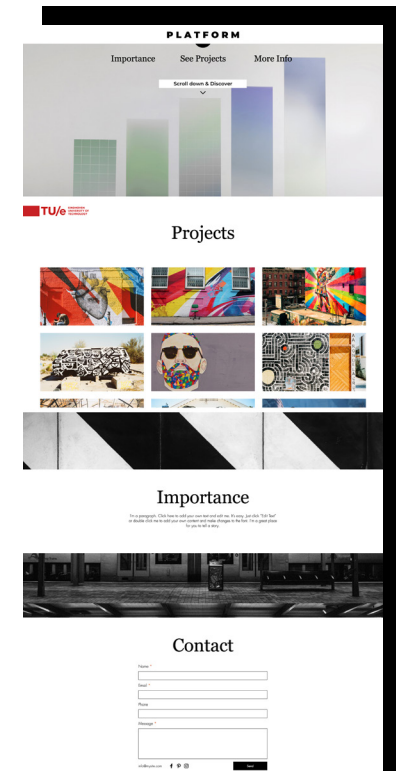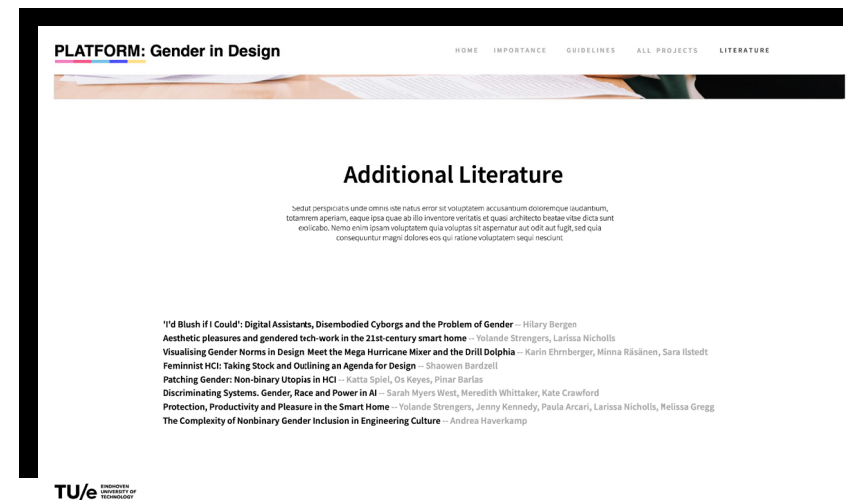

Figure 6. (right)
The platform in an early stage of development.

Figure 7. (bottom)
The Additional Literature page in a further stage of development.

Co-design Session

To best educate myself on the users in this situation and their needs, I reached out to the target group: Students at the University of Technology, Eindhoven (TU/e). I scheduled an online meeting with students who were interested in participating in this co-design session. I wanted to evaluate the platform at that stage, to co-create together with them, and to gain more insights into the experience journey on the platform through making a user journey (Appendix B). I spoke to a total of five students, and we went into detail on the experience, the provided awareness and knowledge, and the action potential generated by the platform. See Appendix B: Co-Design Session for the co-design session consent form and user journey.

The main insights of the session can be summarized as:

- Participants mentioned that the importance of the platform was very clear to them. When asked why gender inclusivity was important, participants could link the information from the Importance page to the guidelines and adequately answer. Moreover, participants saw the day to day usage of the platform and mentioned that they would probably use the platform before, during, and after their design work.

- Participants found that it was hard to visualize the gender spectrum while on the Importance page, and encouraged me to create a clear visual in order to make the information of this section more easily understandable.

- The guidelines were positively received overall. Participants were of the opinion that the guidelines grounded the given knowledge and awareness from the Importance section. However, participants also mentioned that the guidelines alone were a little confusing, and that they wanted to know more of specific guidelines. It was thus adviced to add additional information as to clear up any confusion surrounding the guidelines.

- The overall design and usability of the platform was praised by participants. There were only a few critical points that participants pointed out. Participants mentioned that the platform needed to be polished, and that the banners on the main page of the platform could be used for news or information.

They also mentioned that the various use of art (especially on the home page) was making the website feel a little cluttered and busy. Toned down (monochromatic) art or photogrraphs were adviced. Lastly, participants found that while browsing through the additional literature it would be helpful to be able to select multiple articles at once for comparison.

Expert Feedback: Non-binary Individuals

In order to check the reliability of my information, and to see if I was adequately tackling and handling the problem of binary gender in design, I spoke to four designers who identify as non-binary. It is important to mention here that while these individuals are all designers, they are not students at Industrial Design. While I was hoping to speak to an individual who identified as non-binary within Industrial Design, I unfortunately was unable to find one.

I scheduled online meetings with these individuals to evaluate the platform and the generated knowledge and awareness. There were some overlapping themes and insights:

- It was mentioned that no profit of any kind was to be made from the platform in order to keep it one hundred percent focussed on creating more non-binary inclusion in society. However, the highlighting of successful projects within the industry could help to positively trigger students to enact change, as these kinds of students might be led by the financial or profitable aspects of such projects.

- Another point that was brought up was on how the platform could be used as an avenue of information between newer and older generations of non-binary or queer designers. In this way, the collection of information and awareness created could be passed on; a 'changing of the guard'.

- This point links to the previous one. As mentioned by the non-binary individuals: People within the queer or non-binary community should be in charge of the platform (what information, what sources, what literature, etc.). These individuals could then also act as gatekeepers to dictate what information would be legitimate and what information would not. At the very least, queer people should be directly involved. A reason for this that was that if a cisgendered person would make a mistake concerning the platform, it could generate (more) backlash and alienation from the queer and non-binary communities.

- The length of the Importance section should remain short and concise. This way it should make it more digestible for students new to the subject. Multiple non-binary individuals also mentioned that any step in the direction of more inclusion is good, because no such platform or movement within design exists currently. Thus, only mentioning the umbrella terms and surface level guidelines on gender issues is a good choice (at this point); it brings the topic to the foreground and starts conversations on more non-binarry inclusion in design.

- It was mentioned that the focus of the platform should be on the students that want to change and learn, as other students would be hard to convince.

- All non-binary individuals agreed that the platform shouldn't be about excluding gender, but about the affirmation of differentiating gender identities. They also agreed that it is highly important to add extra resources for additional information on gender identities and organisations. It was also mentionied that the platform has the potential to be its own body (to outgrow the university). One thing was made clear by all individuals as well: Platforms like this one that promote further gender inclusion within design should be made a focus until it is normalized.

After speaking to these individuals, I decided to revert my earlier decision in the project to limit the information on the guidelines. As was mentioned: The additioinal informationi will make sure that the guidelines are easier to understand and grasp. Another decision I made after I spoke to these individuals was to remove my own personal annotations from the additional literature and add more platonic descriptions of the literature. It was mentioned that the platform should be led by non-binary individuals, and some individuals I spoke with even mentioned that the platform should be focussed around gender inclusion, not my personal thoughts and ideas. Of course, it is understandable that my stamp will always remain on the platform as it is my project, but the platform should have its own identity and presence without me.

Expert Feedback: Belle van Kempen

Belle van Kempen is the current Commissioner of Education at LUCID (the study association for Industrial Design Students). I reached out to her because she is able to speak for a large student body. She also has her own views on the best ways for integration of the project in the current environment of the university. Her view on the needs and wants of students at Industrial Design, especially in relation to my project, is imperative.

Belle mentioned that the TU/e is quite behind when it comes to gender awareness in design, highlighting that the current rubrics still refer to students as him or her, and that projects like mine which catalyse such movements are highly necessary. We discussed various ways in which students could be able to be introduced to the platform. Belle provided a handful of options that I took into consideration. First of all, she mentioned that teacher coaches could be used to inspire more gender awareness in students, as they are a direct link between the university and the students. Teacher coaches would have to learn about the platform during training or educational days, where the importance would be explained to them.

Another option that were discussed was through the course User Centered Design. This course is mandatory to all bachelor students, and teacher students the various ways to design with their users through user personas for example. In this scenario, a non-binary persona could be introduced to familiarize the students with the concept. Lastly, the Personal Vision & Identity course that is mandatory for all students could provide the link to and awareness for the platform, as students are expected to create their own view on the future of design here.

We also discussed the motivation for students, and Belle was critical on what sort of students to target. She mentioned that unmotivated students, or ones that focus solely on getting good marks and graduating, will probably not be interested in the platform. Thus, I should target the motivated students, as she believes they are the majority of the student body. In order to attract as much students as I could, I should make sure that the user experience and usability of the platform is great, and that I'm not showering students with information as they already have a lot on their plate. More specifically, she adviced me to focus on hard facts instead of feelings in the Importance and guidelines section. This way, students would come face to face with the facts instead of a subjective view on design that could more easily be dismissed.

Finally, Belle acknowledged that the topic of gender in design should be something that is unmissable in design education, but that this attitude is something that needs to be taught.

Expert Feedback: Lu Yuan

I invited Lu Yuan, the new program director for the Industrial Design department, to come and speak to me about my project. As the to-be program director, I hoped to discuss the possible future integration of my project with her. I was curious to know what her view on the integration of the platform in the existing online infrastructure of the university was, and how the department would handle the platform.

First of all, she mentioned that I needed to make the information concrete for students, and to show them value of the platform. This echoed what Belle had told me in an earlier conversation. Similarly, she also mentioned the 'tick box' students; students who are at the university to pass courses and graduate. She explained that my focus should always be to reach as much students as possible, but that I would never reach all the students at Industrial Design.

We also discussed possible future integrations, and she mentioned that it the platform would probably need to be shown or brought up to students at various intervals. She even mentioned that it could eventually be designed into the university's workflow for optimal visibility, and that the projects displayed on the platform already were a good step to help students imagine their own process in creating more gender inclusive designs.

When we spoke about who within the Industrial Design department would be best suited to lead and update the platform, she mentioned that the ethical committee would probably be in the best position to lead it. However, the committe would have to see the worth of the platform through improved or successful projects first. When asked, she agreed that a future extra member that would be an expert on the topic of gender within the ethical commitee would be preferable.

At the end of our conversation, she clearly stated on thing: The subject of gender inclusion in design is on the table at the department of Industrial Design, and the department is all for further inclusivity and awareness of gender in design education.

After all of the one on one conversations I had with the experts, it became clear to me that if I'm not the right person to create this platform, who is? I was encouraged to give it my best try (especially when I spoke with the non-binary designers), as I was the right person to make judgements about a project like this.

The expert feedback was implemented in the final version of the platform for the Demo Day, which can be seen in the figure on next page (fig. 8).
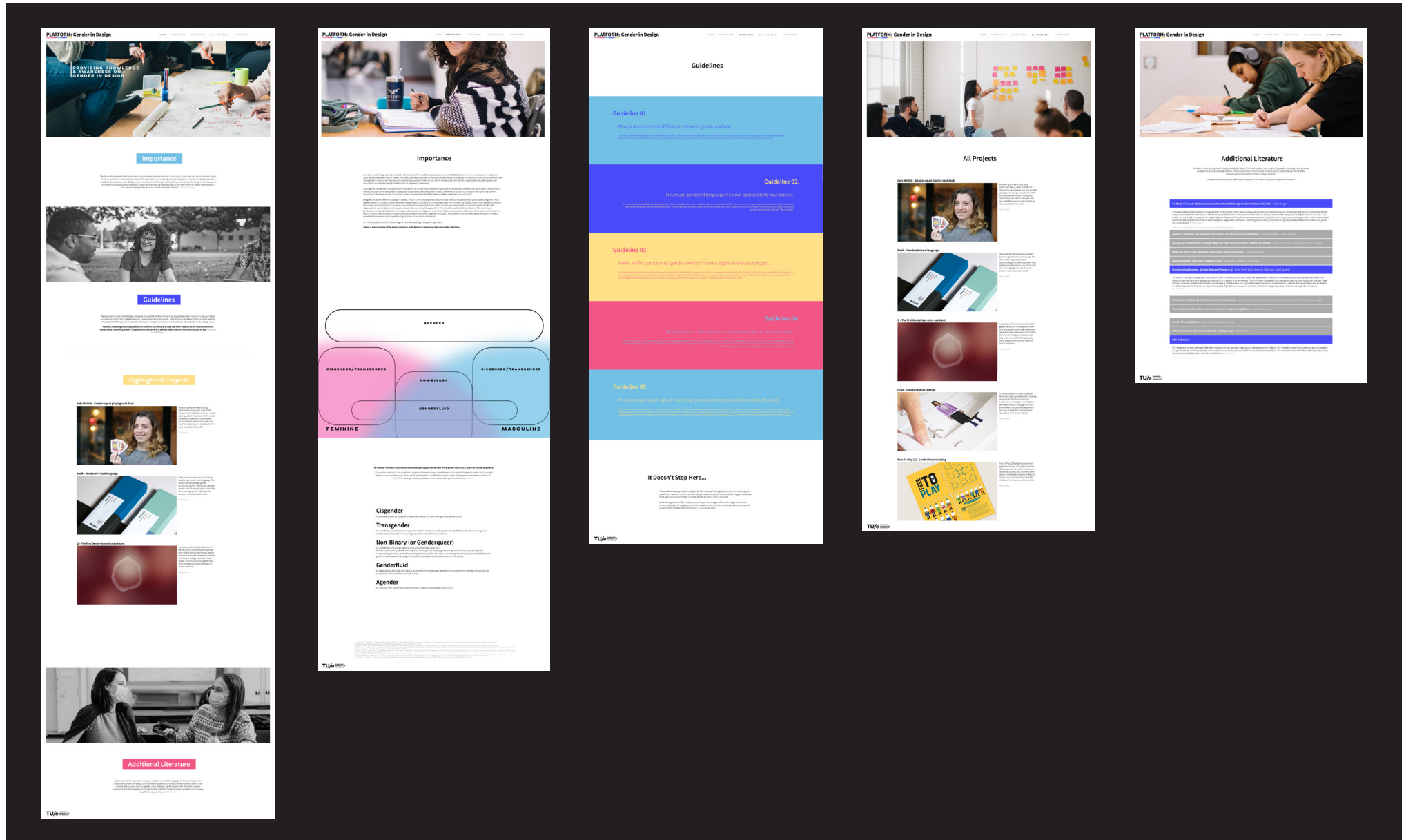
Figure 8.
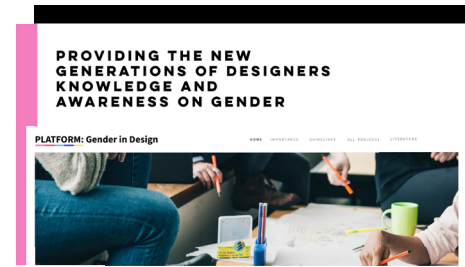*The final version of the platform, as presented during the Demo Day.*

Demo Day

During the Demo Day I presented a video on the platform, together with a poster and five visuals. The visuals (fig. 10) and the poster (fig. 9) served as an initial introduction to the platform. The goal of the visuals was to trigger students to experience the platform that was linked at the end of the page, and to fill in the questionnaire after exploring it. The visuals also highlighted the gender spectrum and explained the important difference between gender and sex, which was done to give designers an initial bit of knowledge and awareness, but also to safeguard the answers in the questionnaire of any confusion that might surface while discussing the topic of gender.

The questionnaire that was used during the Demo Day can be found in Appendix C: Questionnaire Demo Day.

Figure 9. (left)
The poster used during the Demo Day to draw students in.

Figure 10. (right)
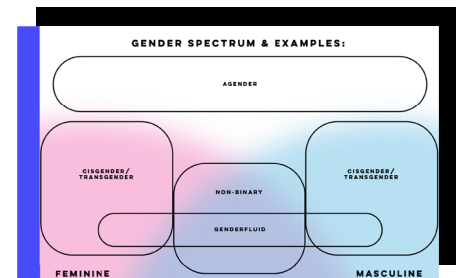*The visuals used during the Demo Day to create interest and share knowledge with the target group*

Evaluation

During the demo day, data was gathered through a questionnaire. Participants were asked various questions on the presented platform to gauge the succes of the project. The success of the project is measured by the following: When it succeeds in clearly translating the need and importance, awareness, information and inspiration to students. Moreover, it should give students a platform that has the ability to grow into something bigger over time; It should be the foundation for something bigger than itself.

The aim was to reach students without previous knowledge on the topic and project. See Appendix C: Questionnaire - Demo Day (page 28) for the specific questions that were asked in the questionnaire.

The questionnaire counted a total of 16 participants that were all Industrial Design students at the TU/e. After data was gathered, a thematic analysis was used to analyse the qualitative data gathered in the questionnaire. 88% of participants had never experienced the platform before (chart 1, page 28), and about half of the participants had no experience with projects related to gender (chart 2, page 28).

Participants were asked what their initial thoughts were while experiencing the platform. 56% of participants indicated being positive about the platform, saying that they would come back to it and that they thought the platform was intriguing. However, one participant mentioned that they were worried about the platform hindering their progress during a project.

When asked about their knowledge on gender before experiencing the platform, participants indicated an average of 3.5 on a scale of one to six, with one being the least and six being the most knowledge. When asked about their knowledge on gender after experiencing the platform, this average number rose to a 4.6 on a scale of one to six (Chart 3 & 4, page 29).

56% of participants found that the platform that was presented provided them with enough information to create more inclusive designs. Moreover, in a later question 88% of participants acknowledged that the platform would stimulate them to consider gender more frequently, and 25% of participants mentioned that the platform can only serve as an improvement to projects.

However, 19% of participants did mention that they would need regular reminders to use the platform, or the platform would have to be a recurring theme.

When asked about a change in their perception of gender, 81% of participants responded that their perception of gender changed a little bit, with the rest of the participants mentioning their perception of gender didn't change at all.

31% of participants indicated that they thought that the projects on the platform served as a source of inspiration, and that they would like to come back to the platform to see updates. In a later question, 75% of participants mentioned that they would actively use the platform. However, 19% of participants mentioned that they would activily use the platform as well, but only at the beginning or end of their project.

When asked about any improvements that could be made to the platform, 38% of participants mentioned that more information on the platform could be beneficial for students. Moreover, 31% of participants mentioned that they thought more guidelines would increase the ease of implementing the knowledge given by the platform. Only 13% of participants mentioned that a way to directly communicate with peers could help.

Discussion

The aim of this project was to create knowledge and awareness on inclusive design and gender implications for designers in an educational setting.

Although most of the participants acknowledged that the platform would stimulate them to consider gender more frequently, and some participants even mentioned that the platform can only serve as an improvement to projects, some participants did mention that they would need to be frequently reminded of the platform in order to keep using it.

This calls into question the presence of the used method, which would perhaps have to be addressed for future projects. A change in the creation of presence of the platform could possibly lead to an increase in effectiveness for reaching students. The more students that are reached, the more awareness of the non-binary is generated in design. The original idea of a tool could serve a purpose here, as it makes it easier for designers to directly implement the knowledge to their work. However, as mentioned by participants, the platform has the ability to grow. I believe that, if nourished, the platform could outgrow the tool in the long run.

Surprisingly, participants mentioned at various points in the questionnaire that they thought additional information on gender would be helpful. Participants even mentioned that an increased amount of guidelines (rules) could help them implement the information into their projects more easily. This is in stark contrast to the expert feedback sessions I conducted and the data from the first questionnaire, where it was mentioned that the information should remain as concise as possible as to not overload students new to the subject with information.

A benefit to having less information on the platform is that it makes the information digestible and clear, as mentioned by participants. However, adding more information is apparently appreciated, and could help students incorporate the knowledge into their work.

Moreover, increased information on the platform could also help to limit the amount of toes stepped on in the non-binary community. What I mean by this is that the non-binary community is already heavily marginalized and underrepresented in society and design. The more knowledge that is added to the platform, the more this marginalization and underrepresentation can be dealt with.

One thing is clear to me, however: Not addressing the issue or not actively contributing to change in this regard is much worse.

While the participants' perception of gender changed little to none, the results from the quesionnaire indicate that participants are enthousiastic about the project. The platform clearly translate its message and the importance of more gender inclusion in design, and participants indicate that their knowledge on gender increased by using the platform. Participants also indicate that the guidelines are clear and that the platform inspires them to create more inclusive designs. In this regard, I would say that the platform was a success in its goals for creating further knowledge and awareness on gender for designers in design education.

Future Work

As the platform has the ability to grow, the future work on this project should focus on nourishing it to allow its growth. Before fully going live on the online environment of the university, the decision on who will update and keep the platform needs to be made. As discussed with Lu Yuan, the ethical comittee, including a possible extra member as a 'gender officer' (expert on gender), could head the platform. The committee has experience with evaluating projects based on ethical guidelines, and the guidelines created for this project could be added to the existing ones.

Of course, the question arises who would fill the position of this 'gender officer'. What immediately comes to mind are researchers knowledgable and critical of gender in design like Andrea Haverkamp (Oregon State University) and Sarah Myers West (AI Now Institute, New York University). Other good options would include Katta Spiel (Vienna University of Technology) and Os Keyes (University of Washington). These researchers could provide an even better view on non-binary gender inclusion within design as they both identify as non-binary themselves. A non-binary designer could add the personal and professional insights to spearhead the platform, which would be beneficial to the platform.

I believe that potential candidates can be found at universities in the Netherlands as well. Look for instance at the Gender Studies master program at the Utrecht University in Utrecht, The Netherlands. The program focusses on issues in society like gender, race, class, sexuality and age. It researches how measures have been taken, in the past and the present, in order to prevent discrimination and exclusion, and how academic, cultural, artistic, journalistic, and policy-making institutions respond to these societal challenges. An individual that graduated from this master's program would be well-suited to join the ethical committee as the expert on gender.

Integrating the platform into the existing ERB form (Ethical Review Form) would be a great future step as well. This way, students will be able to check their own projects on gender inclusivity. If a link would be provided to the platform, students would come into contact with the platform at least once every project. Other ways of getting the platform to students should also be added. Such ways could be through courses like User Centered Design or Personal Vision & Identity, or through squad leaders and teacher coaches. The platform needs to saturate the department in order to maximise the reach it has to students, as it was mentioned by participants that regular reminders of the platform's existance would help.

In order for the ethical committee to be able to evaluate projects by students of the department based on gender, an online way to submit projects should be created and integrated into the Intranet of the university (fig. 11 & 12). Perhaps the infrastructure and back end of Canvas could provide a way to submit projects to the committee in the future as well.

Based on the feedback from the final questionnaire, more information and guidelines could also be added to the platform in the future to further help students incorporate gender inclusivity in their design work. The participants mentioned that they thought this would help them as more 'rules' or guidance would make the information better applicable to their projects.

Ultimately, I see this platform as a kickstarter. I truly believe that in the future this platform has the potential to outgrow the university, or to be applied to other institutions or educational settings outside of the university. The platform would serve as the basis, and specific projects, guidelines, and literature could be applied to it to suit specific needs within an institution.

PLATFORM: Gender in Design

HOME   IMPORTANCE   GUIDELINES   ALL PROJECTS   LITERATURE

Submit Project

All Projects

PLATFORM: Gender in Design

HOME   IMPORTANCE   GUIDELINES   **ALL PROJECTS**   LITERATURE

Submit Project

On this page you will be able to upload and submit your project to the ethical committee. The ethical committee will check if your project conforms to the provided information and guidelines on this platform. If approved, your project will join many others in inspiring Industrial Designers at the TU/e.

Full name

Student number

Email address (TU/e)

Name of the project

Description of project

Choose file...

Submit

Figure 11. (top)
The All Projects section of the platform, including an added 'Submit Project' button.

Figure 12. (right)
A visual of a future Submit Project page, where students can upload their projects to the platform for evaluation.

Conclusion

This project aims to create more knowledge, awareness, and inclusivity on non-binary aspect and implications in design and design education, in order to eventually see positive change in society as well. This is necessary as the non-binary, genderqueer and genderless are still vastly underrepresented in design, which is detrimental to a fully inclusive society.

Through the creation of a platform, this project provided students with the background knowledge, awareness, guidance and literature they need to create more inclusive designs in terms of non-binary gender identities. Results highlight the willingness to adapt the information, and show motivation and inspiration gained from the platform to enact positive change in society. This creates an opening for the growth of the platform and further steps towards inclusivity in design.

I believe that a fully inclusive society is something designers should actively be striving for. Through projects like mine, they are able to obtain increased knowledge and awareness on underrepresented topics like non-binary gender identities. Providing the newer generation of designers with the awareness, knowledge and guidance they need to create more inclusive designs is the next step for further inclusivity in design and society.

References

[1] BARDZELL, S. 2010. Feminist HCI: taking stock and outlining an agenda for design. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '10). Association for Computing Machinery, New York, NY, USA, 1301–1310. DOI: https://doi.org/10.1145/1753326.1753521

[2] BOCKTING, W.O., MINER, M.H., SWINBURNE ROMINE, R.E., HAMILTON, A., COLEMAN, E. Stigma, Mental Health, and Resilience in an Online Sample of the US Transgender Population. American Journal of Public Health 103, no. 5 (May 1, 2013): pp. 943-951. DOI: https://doi.org/10.2105/ AJPH.2013.301241

[3] BRADFORD, F., REISNER, S.L., HONNOLD, J.A., AND XAVIER, J. Experiences of Transgender-Related Discrimination and Implications for Health: Results From the Virginia Transgender Health Initiative Study. American Journal of Public Health 103, no.10 (October 1, 2013): pp.1820-1829. DOI: https://doi.org/10.2105AJPH.2012.300796

[4] BUIJS, R. (2020). Genders & Smart Home Voice Assistants: Advantages & Disadvantages in Relation to a Non-Binary Society. Unpublished manuscript, Eindhoven University of Technology, Eindhoven, The Netherlands.

[5] BUIJS, R. (2020). Envisioning Genderless Futures Through Design Fiction. Unpublished manuscript, Eindhoven University of Technology, Eindhoven, The Netherlands.

[6] VAN CAENEGEM, E., WIERCKX, K., ELAUT, E. et al. Prevalence of Gender Nonconformity in Flanders, Belgium. Archives of Sexual Behavior, 44, 1281–1287 (2015). DOI: https://doi.org/10.1007/s10508-014-0452-6

[7] CHATTERTON, T., AND NEWMARCH, G. (2016) "The Future is Already Here - It's Just Not Very Evenly Distributed". In: Spurling N. and Kuijer, L. (Eds) Everyday Futures. (2016). Everyday futures. Lancaster: Lancaster University. Institute for Social Studies. Retrieved from http://wp.lancs.ac.uk/everydayfutures/files/2016/08/chatterton_newmarch.pdf

[8] EHRNBERGER, K., RÄSÄNEN, M., AND ILSTEDT, S. 2012 Dec 20. Visualising Gender Norms in Design: Meet the Mega Hurricane Mixer and the Drill Dolphia. International Journal of Design [Online] 6:3. Retrieved from http://www.ijdesign.org/index.php/IJDesign/article/view/1070

[9] HARVARD DIVINITY SCHOOL. The Third Gender and Hijras: Hinduism Case Study. (2018). Retrieved from https://rpl.hds.harvard.edu/religion-context/case-studies/gender/third-gender-and-hijras

[10] HAVERKAMP, A. (2018). The Complexity of Nonbinary Gender Inclusion in Engineering Culture. Retrieved from https://www.researchgate.net/publication/328030540_The_Complexity_of_Nonbinary_Gender_Inclusion_in_Engineering_Culture

[11] INDIAN HEALTH SERVICE. Two-Spirit. U.S. Department of Health and and Human Services. Retrieved from https://www.ihs.gov/lgbt/health/twospirit/

[12] JAMES, S.E., HERMAN, J.L., RANKIN, S., KEISLING, M., MOTTET, L., AND ANAFI, M. (2016). The Report of the 2015 U.S. Transgender Survey. Washington, DC: National Center for Transgender Equality. Retrieved from https://www.transequality.org/sites/default/files/docs/usts/USTS%20Full%20Report%20-%20FINAL%201.6.17.pdf

[13] KUIJER, L. (2020). "Democratising and Anticipating Everyday Futures Through Critical Design: A Review of Exemplars". Temes de Disseny, [online], 2020, Num. 36, pp. 150- 77, https://doi.org/10.46467/TdD36.2020.150-177.

[14] KUYPER, L., WIJSEN, C. Gender Identities and Gender Dysphoria in the Netherlands. Archives of Sexual Behavior, 43, 377–385 (2014). DOI: https:// doi.org/10.1007/s10508-013-0140-y

[15] MILLS, S., DION, M., THOMPSON-BLUM, D., BORST, C., DIEMERT, J. 2019. Mapping the Void: Two-Spirit and LGBTIQ+ Experiences in Hamilton. Retrieved from https:/labourstudies.mcmaster.ca/documents/mappingthevoid.pdf

[16] MONRO, S. Non-binary and genderqueer: An overview of the field. International Journal of Transgenderism, Volume 20 (Jan. 2019), 126-131. DOI: https://doi.org/10.1080/15532739.2018.1538841

[17] OBINALI, C. 2019. The Perception of Gender in Voice Assistants. SAIS 2019 Proceedings. 39. Retrieved from https://aisel.aisnet.org/sais2019/39

[18] RODE, J.A., 2011. A theoretical agenda for feminist HCI. Interacting with Computers 23, 393-400. Retrieved from https://dl.acm.org/doi/10.1016/j.intcom.2011.04.005

[19] RODE, J.A. and POOLE, E.S., 2018. Putting the gender back in digital housekeeping. In GenderIT ACM, Heilbronn, Germany, 14-15 May, 79-90. Retrieved from http://dx.doi.org/10.1145/3196839.3196845

[20] SCANDURRA, C., AMODEO, A.L., VALERIO, P., BOCHICCHIO, V., FROST, D.M. Minority Stress, Resilience, and Mental Health: A Study of Italian Transgender People. Journal of Social Issues (Sep. 2017). DOI: https://doi.org/10.1111/josi.12232

[21] SCHIFFER, Z. (2020). This Girls-Only App Uses AI to Screen a User's Gender — What Could Go Wrong? The Verge. Retrieved from www.theverge.com/2020/2/7/21128236/gender-app-giggle-women-ai-screen-trans-social.

[22] SØNDERGAARD, M.L.J., AND HANSEN, L.K. (2018). Intimate Futures: Staying with the Trouble of Digital Personal Assistants through Design Fiction. In Proceedings of the 2018 Designing Interactive Systems Conference (DIS '18). Association for Computing Machinery, New York, NY, USA, 869–880. DOI: https://doi.org/10.1145/3196709.3196766

[23] SPIEL, K., KEYES, O., AND PINAR BARLAS. 2019. Patching genders: non-binary utopias in HCI. In Proceedings of CHI Conference on Human Factors in Computing Systems Extended Abstracts (CHI'19 Extended Abstracts), May 4–9, 2019, Glasgow, Scotland UK. ACM, New York, NY, USA 10 Pages. DOI: https://doi.org/10.1145/3290607.3310425

[24] STRENGERS, Y., KENNEDY, J., ACARI, P., NICHOLLS, L., AND GREGG, M. 2019. Protection, Productivity and Pleasure in the Smart Home: Emerging Expectations and Gendered Insights from Australian Early Adopters. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems (CHI '19). Association for Computing Machinery, New York, NY, USA, Paper 645, 1–13. DOI:https://doi.org/10.1145/3290605.3300875

[25] STRENGERS, Y., QU, L., XU, Q., KNIBBE, J. 2020. Adhering, Steering, and Queering: Treatment of Gender in Natural Language Generation. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20). Association for Computing Machinery, New York, NY, USA, 1–14. DOI:https://doi.org/10.1145/3313831.3376315

[26] STIP, E. Les RaeRae et Mahu: troisième sexe polynésien [RaeRae and Mahu: third polynesian gender]. Sante Ment Que. 2015 Fall;40(3):193-208. French. PMID: 26966855. Retrieved from https://pubmed.ncbi.nlm.nih.gov/26966855/

[27] UNESCO. 2019. I'd blush if I could. Retrieved form https://unesdoc.unesco.org/ark:/48223/pf0000367416.page=1

[28] WEST, S.M., WHITTAKER, M., AND CRAWFORD, K. 2019. Discriminating Systems: Gender, Race and Power in AI. AI Now Institute. Retrieved from https://ainowinstitute.org/discriminatingsystems.html

[29] 16 PERSONALITIES: Free Personality Test. Retrieved from https://www.16personalities.com/free-personality-test

[30] PHIPPS, A. Sussex University. Gender Theory Syllabus. Retrieved from: https://genderate.files.wordpress.com/2021/03/gender-theory-syllabus.pdf

Appendix A: Questionnaire - Tool

1. Consent

The project 'Creating Knowledge & Awareness for further Inclusivity in Design Education' from Rick Buijs in collaboration with the Eindhoven University of Technology aims to create a product that stimulates awareness and knowledge on gender, and further inclusivity of gender, in design education. It is therefore essential that designers are questioned on to evaluate the product created for this project, and that thoughts and opinions on this project are gathered.

You are invited to take part in this project where a master's student from the Eindhoven University of Technology will ask you a few questions regarding an existing prototype. After experiencing the prototype you'll be asked to fill in the answers to a number of questions.

You are not in any way obligated to answer any of the questions that are presented to you. In case you would like to withdraw from this or any future questionnaire, you are allowed to do so at any time. All information that is gathered through this questionnaire will be treated as confidential, and all participants will remain anonymous. *

○ I have understood the 'consent', and voluntarily participate in this questionnaire. I understand that my consent does not damage my legal rights in the event of negligence or other legal fault of anyone involved in this study. I also give permission and understand that my data may be used for the purpose of this research. I understand that this data will be processed anonymously.

Question 1: What are your immediate thoughts after experiencing the tool?

Self Description	Frequency	Examples
Positive on usefulness	9	'Looks like a useful tool on a diverse range of projects.' 'Clear, applicable to many areas. Could be implemented in other kinds of education as well. Or in other kinds of environments.' 'Useful tool. Gives designers a helping hand in creating inclusive designs.'
Aesthetics	4	'It looks good, the colours work well together.'
Should already exist	3	'I don't understand why something like this doesn't already exist.' 'Until now all of the effort has to come from you. The university or teachers/ staff members are a little behind because they give no attention to the subject (yet). This tool could provide the breakthrough for that.'

General themes & main points: Positive (about tool); Necessity.

- 82% of participants indicated that they thought the tool was useful.

- 27% of participants mentioned that a tool like this one should already exist.

Question 2: Do you think this tool will grant you the necessary information to create more inclusive designs? Why?

Self Description	Frequency	Examples
Positive	7	'Yes, it keeps you alert and sharp by using this tool to check your project during and after the design process.'
Doubtful	4	'I believe it's a very good step in the right direction, but there should be more material to work with.' 'More background information on the subject would help. It felt like I was thrown in the deep a little bit.'

General themes & main points: Need for more information.

- 67% of participants were positive about the information that was on

- 33% of participants were doubtful about it, mentioning the need for more information on the subject.

Question 3: Do you think the information in the tool and awareness generated through this tool is enough? Why?

Self Description	Frequency	Examples
Positive	8	'It definitely surprised me when I read the 'Why?' section, and it made me think more about the subject.' 'I feel a lot more knowledgable now about the subject.'
Extra information necessary	3	'The extra information is definitely necessary to understand the guidelines, especially when using the tool for the first few times.'

General themes & main points: Necessity of information; Creation of awareness.

- 73% of participants were positive about their generated awareness and knowledge with the tool.

- 27% of participants mentioned that the extra information was necessary to

Question 4: Do you think that you'll actively use this tool? Why?

Self Description	Frequency	Examples
Yes	11	'Yes, I would use this tool to check my project or report before and after because I always want to make them maximally inclusive.' 'The tool only makes your projects better, so it's always useful to take a look at it to improve your projects.'

General themes & main points: Ability to improve.

- All participants were positive about using the tool for their projects in order to improve them.

Question 5: What do you remember from using the tool?

Self Description	Frequency	Examples
Useful	5	'I think that it's applicable for many different occasions, but also to check the process of your project.'
Extra information good	4	'I didn't know much about gender, so especially the last page helped me to put the guidelines into perspective.'
Positive on guidelines	7	'The guidelines are neat and compact, and offer us a quick reference guide to use.' 'I liked that the guidelines weren't too complicated, it kept it manageable so I could imagine actually using them in my project.'

General themes & main points: Applicable; Impactful.

- 45% of participants mentioned that they thought the tool would be useful in practice.
- 36% of participants mentioned that the extra information at the end was useful and necessary.
- 64% of participants were positive about the guidelines in their current state.

Question 6: Do you see any possibilities for further implementation of the tool?

Self Description	Frequency	Examples
Yes	10	'Yes, this could grow into something that needs to be used during a whole study.' 'The tool can transform into ethical guidelines that we could use on the basis of inclusivity.'
Doubtful	1	'It will be hard because this subject is already so difficult to speak about, especially with the university involved. I think there will be a lot of pushback.'

General themes & main points: Ability to grow; Concern on involvement university.

- 91% of participants saw possibilities for further implementation of the tool.
- 9% of participants was wary about the university's involvement as it could halt further implementation.

Question 7: In what ways do you think the tool could be improved?

Self Description	Frequency	Examples
Design Projects	4	'You could add more projects directly related to Industrial Design students.' 'More designs that are applicable to Industrial Designers could add a lot to the tool. It would make it speak more to students.'
Usability	2	'Make sure that the usability is perfect so that students won't be bothered by it.'

General themes & main points: Increase amount of projects; Usability.

- 36% of participants mentioned that adding more projects that would be applicable to Industrial Design students could be beneficial.
- 18% of participants mentioned that the usability should be great.

Question 8: Do you have any final thoughts, opinions or remarks?

Self Description	Frequency	Examples
Translation of purpose	4	'Must be seen as opportunity to improve design, not a nuisance against the design. Shouldn't be a difficult threshold to overcome, but that also depends on the designers themselves.'
Aesthetically pleasing	2	'The colours work very well together.'
Create space for gender talks	3	'Could be used in a setting where you would converse and discuss about inclusivity. Normally this doesn't come up because people don't want to talk about it or don't know about it/don't care about it. This could then open the floor for critical questions and further discussions. This gives it a firm place, the tool (positively) demands attention and awareness.'

General themes & main points: Aesthetic; Open setting; Positive association.

- 36% of participants mentioned that the tool should be positively regarded by students.
- 18% of participants mentioned that the tool looked aesthetically pleasing.
- 27% of participants mentioned that the tool could be used to create an open space for further conversations on the topic of gender within design.

Appendix B: Co-Design Session

1. Consent

The project 'Creating Knowledge & Awareness for further Inclusivity in Design Education' from Rick Buijs in collaboration with the Eindhoven University of Technology aims to create a platform that stimulates awareness and knowledge on gender, and further inclusivity of gender, in design education. It is therefore essential that designers are questioned on to evaluate the platform created for this project, and that thoughts and opinions on this project are gathered.

You are invited to take part in this project where a master's student from the Eindhoven University of Technology will ask you a few questions regarding an existing prototype. After experiencing the prototype you'll be asked to fill in the answers to a number of questions.

You are not in any way obligated to answer any of the questions that are presented to you. In case you would like to withdraw from this or any future questionnaire, you are allowed to do so at any time. All information that is gathered through this questionnaire will be treated as confidential, and all participants will remain anonymous. *

○ I have understood the 'consent', and voluntarily participate in this questionnaire. I understand that my consent does not damage my legal rights in the event of negligence or other legal fault of anyone involved in this study. I also give permission and understand that my data may be used for the purpose of this research. I understand that this data will be processed anonymously.

Steps	Home	Importance	Guidelines	All Projects	Additional Literature	Free
Actions	Browsing/ Exploring	Interpreting knowledge	Grounding knowledge	Clicking on projects	Opening Literature	Back to Home/ Importance
Questions	Why this platform?	What is the real problem? / Big enough spark? / Why these genders?	Why these guidelines	What do projects have in common	Why these works?	Back to Home/ Importance
Positive points	Aesthetically pleasing/ Clear	Clear info / Sticks with you / Makes you aware	Good colour use / Clear rules	Fun to see other projects / Examples are successful	Not too many / Interesting subjects / Other sources help	
Pain points	Too many projects on page / Art makes it cluttered	Hard to visualize spectrum	Grounding knowledge > literature / No additional info	No projects from ID	Selecting not clear / Can't open multiple / Can't compare	
Technical limits		Contained with text	Quickly back-and-forth		Can't see overview	

Appendix C: Questionnaire - Demo Day

1. Consent

The project 'Creating Knowledge & Awareness for further Inclusivity in Design Education' from Rick Buijs in collaboration with the Eindhoven University of Technology aims to create a platform that stimulates awareness and knowledge on gender, and further inclusivity of gender, in design education. It is therefore essential that designers are questioned on to evaluate the platform created for this project, and that thoughts and opinions on this project are gathered.

You are invited to take part in this project where a master's student from the Eindhoven University of Technology will ask you a few questions regarding an existing prototype. After experiencing the prototype you'll be asked to fill in the answers to a number of questions.

You are not in any way obligated to answer any of the questions that are presented to you. In case you would like to withdraw from this or any future questionnaire, you are allowed to do so at any time. All information that is gathered through this questionnaire will be treated as confidential, and all participants will remain anonymous. *

○ I have understood the 'consent', and voluntarily participate in this questionnaire. I understand that my consent does not damage my legal rights in the event of negligence or other legal fault of anyone involved in this study. I also give permission and understand that my data may be used for the purpose of this research. I understand that this data will be processed anonymously.

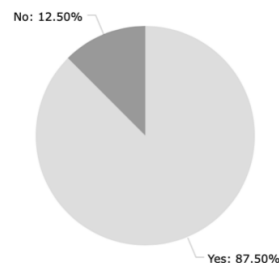Question 1: Was this your first time experiencing this platform?

Chart 1

Question 2: What are your immediate thoughts after experiencing the platform?

Self Description	Frequency	Examples
New information	4	'There is a lot of information shared on this platform that I was not familiar with or that I already knew.'
Positive	9	'I definitely wanna come back again and read it in more, the platform makes the topic intriguing.' 'As a designer myself, I found it especially helpful to see examples of projects in which gender equality was highlighted.' 'I find it a perfect and gentle way of 'gate keeping'. Just by being informative and educational, instead of pointing fingers.'
Concern	1	'My thought is a worry. If my study projects were to be subjected to more rules like this, wouldn't this hinder the progress or increase scope when the goal is not at all related to this topic?'
Information quality	2	'I'm glad that the platform mentions that not all genders are described in order to keep it clear for people who don't know much about gender.'

General themes & main points: Quality of (new) information; Concern of implementation; Enthusiasm.

- 56% of participants were positive about the platform.

- 25% of participants mentioned that the information on the platform was new to them.

- 13% of participants mentioned that the information quality of the platform was good.

- One participant expressed worry about the platform hindering progress during projects (more rules).

Question 3: Do you have previous experience with gender-related projects like this one?
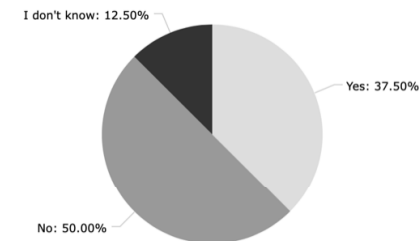

Chart 2

Question 4: On a scale of 1 to 6 (with 1 being the least and 6 being the most), how much knowledge do you believe you have on gender (before experiencing the platform)?
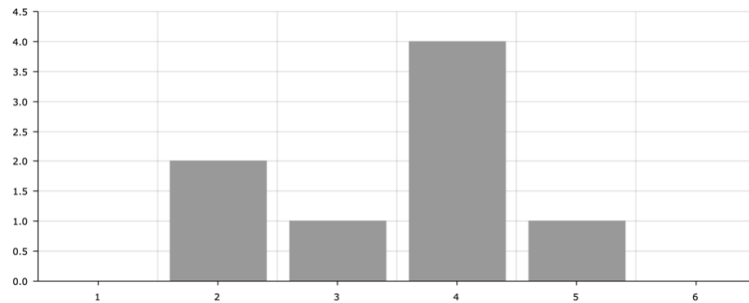

Chart 3

Question 5: On a scale of 1 to 6 (with 1 being the least and 6 being the most), how much knowledge do you believe you have on gender after experiencing the platform?
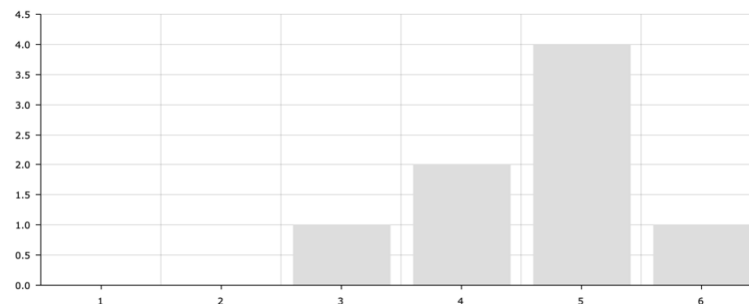

Chart 4

Question 6: Do you think this platform provides you with enough information to create more inclusive designs? Why or why not?

Self Description	Frequency	Examples
Applicable guidelines	4	'I do believe the guidelines offer tangible information that could be applied to any project or design. I have often experienced that guidelines can be very vague, or not applicable to all projects. I believe that is why the platform offers concrete information to create more inclusive designs.'
Positive	9	'I think assigning gender to your designs is something that happens often times unconsciously so standing still and reflecting on your work is important. It is good to be reminded of during the process as well. designers should have these guidelines hanging up in the office.' 'The platform gives me a framework to help judge if my work is gender-inclusive.'
Examples (projects)	5	'Yes, aside from the global explanation on gender the examples are great for us designers to have that push in the right direction. They also serve as a source of inspiration.' 'This is a great start to gathering and obtaining more information. The inspiration that you get from the projects and seeing the guidelines applied in practice helps a lot.'

General themes & main points: Useful; Applicable; Inspirational.

- 56% of participants were positive that the platform provided them with enough information.
- 25% of participants mentioned that the guidelines were applicable to projects
- 31% of participants found that the example projects given were a source of inspiration and understanding.

Question 7: Do you think the platform stimulates you to consider gender more frequently in your designs? Why or why not?

Self Description	Frequency	Examples
Positive	14	'Yes, if it keeps getting updated with current examples or news articles of products that are made to be inclusive as alternatives to products that might be less inclusive.' 'Yes! Because the information is easy-going and doesn't feel aggressive at all. I believe this way it is more fun to learn. And more fun to educate yourself'
Remembering of using	3	'I doubt whether I will remember to use this platform the next time I will be starting a design project. That is when it is most important to read and take into account the guidelines. I do believe that after visiting this platform, I am more aware about the necessity of inclusive design and it will remain in the back of my mind.'
Inclusivity	4	'There is no reason not to, the more inclusivity you can consider in your project, the better it will be for all users.'

General themes & main points: Frequency; Inclusivity.

- 88% of participants acknowledged that the platform would stimulate them to consider gender more frequently.
- 19% of participants mentioned that they would need a reminder in order to keep using the platform.
- 25% of participants mentioned that the platform can only be an improvement to projects.

Question 8: In what ways did your perception of gender change after experiencing the platform?

Self Description	Frequency	Examples
Little change	13	'My perception of gender has not changed drastically. The platform has just improved my knowledge on inclusive design, the importance of it and the many different terms associated to gender.' 'I would say I was already fairly aware of the whole spectrum of gender. As well as the fact that gender is just a social construct. But it was very interesting to learn more in depth about some specifics and see the visual you created.'
No change	3	'My perception about gender did not really change, but it did change the way I think about how this information is so unclear to some.'

General themes & main points: Improvement of knowledge; Perspectives; In-depth knowledge.

- 81% of participants mentioned that their perception of gender changed a little bit.

- 19% of participants mentioned that they didn't think their perception of gender changed.

Question 9: Do you think that you'll actively use this platform? Why?

Self Description	Frequency	Examples
Only as inspiration	1	'Just as a source of inspiration, I feel that reading the guidelines once is enough.'
Negative	3	'I do not think I will actively use this platform as these guidelines will only be searched once per project perhaps. Then people have enough information in order to continue their project and consider inclusive design.'
Positive	12	'I think i have plenty of knowledge about gender, but I like to be sure about some things. This is one of them. I would definitely use the platform to test myself, but also others. This is a good platform to share with people who are struggling with gender' 'As a designer this is a great platform because it inspires you and it keeps you up to date on nieuwe projects that are gender inclusive. These projects can then stimulate you to innovate and make your designs more inclusive as well.'

General themes & main points: Frequency of use; Source of inspiration; Repetitive.

- 75% of participants mentioned that they would actively use the platform.

- 19% of participants mentioned that they would only use this platform at the beginning or end of their project.

- One participant mentioned that they would only have to read the guidelines once.

Question 10: In what ways do you think the platform could be improved?

Self Description	Frequency	Examples
Communication with peers	2	'I think there could be more options to communicate with people, give feedback and share ideas. Perhaps people could give each other advice and share the importance of applying these guidelines and how it effected user/society.'
Socials/ promoting	2	'To generate more visitors to the site, perhaps the department could promote the platform on Canvas and in UNID. It could also use its own instagram page so that students could be updated.'
Increase information	6	'More personal stories from non-binary individuals and more concrete examples (in the form of projects) are always great!'
Increase number of guidelines	5	'I love the guidelines, its a quick and easy check to see if your work is inclusive. I'd like to see more of the guidelines.' 'At a later stage you could add more guidelines to make it even easier for designers to apply these rules to their projects.'
Additional ways of implementing	2	'Are there any design patterns that can be applied in certain situations to certain projects, that will make them more inclusive? Could be useful to include them.'

General themes & main points: Additional information; Increased number of guidelines; Communication.

- 38% of participants mentioned that more information on the platform could be beneficial.

- 31% of participants mentioned that they thought more guidelines would increase the ease of implementing the knowledge.

- 13% of participants mentioned that a way to communicate with students directly could help.

- 13% of participants mentioned that linking the platform to social media or existing media within the department of Industrial Design could be beneficial.

Question 11: Do you have any final thoughts, opinions or remarks?

Self Description	Frequency	Examples
Aesthetically pleasing	3	'The platform looks clean and is easy to navigate! It motivates me to actually come back and read through it all again.'
Positive	2	'I love the idea of this platform and I think it will really help designers. I love the gentle touch that the platform has and i would definitely share it with designers who'm struggle with this subject.' 'What a great initiative, I cannot wait to see the platform grow and develop into its own thing.'

General themes & main points: Aesthetics; Positive effect.

- 19% of participants mentioned that they thought the platform was aesthetically pleasing and easy to use.

- 13% of participants mentioned that the platform was a great initiative.

Appendix D: Personal Reflection

I had and still have an amazing passion and long love for equality and the underrepresentation of transgender, non-binary and LGBTQIA+ communities in design and society. Thus, during this project I once again went to work on trying to tackle this underrepresentation. I felt that I could take this opportunity to positively impact design and society by creating awareness and knowledge. I also felt that this could help me personally grow into the kind of industrial designer I aim to be in the future.

During this project, I had to make some hard decisions that would influence the final outcome of the platform. As making decisions is a big theme of my personal development during my master's program, I knew I had to be concrete and concise.

I made the choice to keep the guidelines at surface level, and to provide users only with the basic information on gender (the umbrella terms). This felt like an impossible decision as there was no right answer. On one hand, I knew that I wouldn't want to overwhelm the students by providing too much information on the subject. On the other hand, however, I didn't want to hurt the non-binary community by not representing them enough or in the right ways.

The goal for my projects in the past year-and-a-half was always to make sure that non-binary gender identities and individuals were better represented in order to cause them less harm, not the opposite. A big personal development point here for me was the realization that I will never be able to keep everyone happy, and that I will always tread on someone's toes. The important part here is to keep moving forward and focus on the positive change the project will bring to society and design.

In the same way, my decisions around the platform might have been too 'kind'. Perhaps the platform would have benefitted more from concrete examples of projects that were not at all good for gender inclusivity, for example. However, I do stand by my decisions.

Through speaking with non-binary individuals during this project, I felt solid in the provided amount of information and literature. However, the development of the platform was the part of the project were I felt most lost and out of my comfort zone. There was little to no help that could be provided to me, as the work I'm doing is quite innovative. The only person who knew how best to place this information, in what amount to give the information, and how to best approach the target group was me. I had to trust in myself to be my own authority on gender within design. I feel like my confidence was boosted in this regard, as I truly believe that I am now a source and promoter of increased knowledge, awareness, and inclusivity of non-binary gender in design.

This semester, I truly felt and understood that I was swimming upstream concerning inclusivity in design. I knew that my project was far from the usual type of projects that are conducted at the department of Industrial Design or even at the university. I experienced more backlash from conducting the project than I had originally realised, and at certain moments this took extra effort to overcome. However, the pushback on my project only served to make me more enthusiastic and passioned about my cause. I now know for certain that further inclusivity in design is something that I'll be chasing long after my master's program, and I'm glad that I was able to cement my vision for my future path and goals through this project.