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DESIGN WITH A CRITICAL LENS TEACHING STUDENTS HOW TO FIND. RATHER THAN SOLVE. DESIGN CHALLENGES USING INTERDISCIPLINARY WORKSHOPS

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ABSTRACT
The Critical Design Workshop series aimed to give students experience of designing for social emancipation and cohesion. In times where extreme circumstances and polarization are hardening the social debate, transferring this power to design students can enable them to identify various ethical issues, such as guilt, fear, stigma or social gaps, early in the design process. Through four, five-day interdisciplinary workshops – conducted from 2018 to 2021 – approximately 60 students from disciplines including design, architecture and engineering were encouraged to generate critical design examples shedding light on assistive technology, product-related stigma, empathy and human augmentation, respectively. By first making the students believe they were approaching the design challenge using a traditional problem-solving approach, they gained hands-on knowledge about the fundamental difference between affirmative and critical design. The first three workshops were conducted face-to-face, but due to COVID-19, the fourth workshop was held online. Despite the different format, the hybrid version managed to maintain both the pedagogical content and the spirit of the earlier workshops and, furthermore, the students reported that the 'upside-down' methodology was liberating, engaging and effective no matter what format. This paper presents the structure, content and results of the four workshops, and discusses the inevitable transition from a physical to a hybrid-learning environment.

Keywords: Critical design, stigma-free design, design methods, educational practices, workshops

1 INTRODUCTION
Traditionally, designers apply affirmative design[1] approaches in the design process, providing answers or solutions to questions or design challenges, reinforcing the current situation rather than rejecting it and thereby encouraging critical thinking [1],[2]. This is simply how we are trained to perform as 'problem-solvers' (and 'solution-focused') [3]. Critical and speculative design has been around since the late 1990s and it has proven to be effective as a medium for inquiry into present social, cultural, ethical, technical and economic implications of design and practice for decades [1],[2],[4]. However, our collective experience from conducting critical design workshops for more than 10 years in various higher education institutions in Europe [5–8] is that more emphasis could be put on this alternative way of thinking through design to, in short, open the minds of students.
The importance of teaching students about existing stereotypes and prejudices also needs to be emphasized, given that products can be embedded with qualities and attributes, which directly cause social rejection and stigma among users and bystanders – even when nobody else is around. According to [9], the power of public stigma can make users of certain products experience discrimination,

[1] According to Dunne and Raby, 'Affirmative design' reinforces predominant social, technical or economic values, while 'Critical Design' strives for an alternative form of product design, positioned as a medium for inquiry [2, 16, 17].

alienation and inequality, rejecting the products altogether and, in the worst-case scenario, leading to a stigmatized condition that triggers further inequality and exclusion from society.
For this case study, we explored the above-mentioned critical/affirmative dichotomy through four interdisciplinary one-week workshops focusing on, for example, how to design stigma-free products, environments, systems and services with respect to equality, diversity and inclusion using the stigma-free design toolkit [9, 10] but with a 'critical twist'. This involved generating 'stigma-free design' (SFD) [10] during the first two-and-a-half-days, with the students spending the latter half of the week developing critical design (CD) examples[2] [5], which helped them to let go of traditional problem-solving methods and instead tap into the power of problem-finding (exposing).

Figure 1. Some of the CD examples generated in WS1-WS2, shedding light on (from left to right) what life might look like when dependent on: a cane for the blind (#Can'tYouSee?); tracheostomy covers (#SmokingHot); or a colostomy bag (#Carry-on); or when suffering from Paruresis/'shy bladder' syndrome (#Exposed)

We believe that by enabling students to identify various moral and ethical issues, as discussed above, the next generation of designers, architects and engineers will be better equipped to be 'problem-finders (exposers)' as well as 'problem-solvers' and, thus, far better suited to dealing with twenty-first-century challenges whatever they might be [11].

2 METHOD

2.1 Critical twist

Authors Vaes and Torkildsby conducted four workshops (WS1-WS4) as part of the International Design Workshop Week, at the Faculty of Design Sciences at the University of Antwerp. While WS1-WS2 were merely about how to illustrate universal design [6] and empathic design through CD, respectively [7], WS3-WS4 were divided into two parts: a stigma-free design challenge (i.e. SOLVING), followed by a critical design twist (i.e. EXPOSING) (see Figure 2) [11]. It should be noted that there were 15 students in total in each of the workshops, and they were divided into four teams by the tutors with both genders represented.

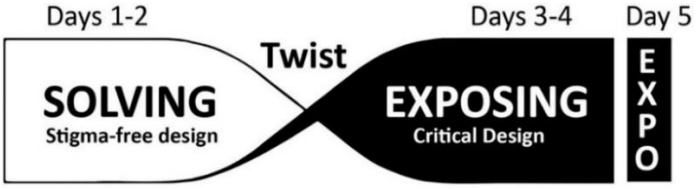

Figure 2. Visualization of the workshop layout, including the 'critical twist'

2.1.1 Step 1 – SOLVING

In this step, we exposed our students to two expeditious exercises. The students were first challenged to explore the context of a specific stigma-eliciting product, e.g., a hearing aid, identifying the main sensitivities for both the product, the user, people they engage with and society at large. To facilitate this, they used a checklist of 27 questions (PAMS - Products Appraisal Model for Stigma) [9] to 'unveil' stigma pitfalls and social conflicts embodied in the specific product. The tutors requested the students to synthesize this exercise into a selection and description of the six most socially challenging and stigmatizing aspects. In a second exercise, we provided our students with 17 inspirational stigma-reducing design cards (PIMS - Product Intervention Model for Stigma) [9], which aimed to inspire them to develop concepts that could not only solve the six stigma challenges they defined, but could also increase consumer product attachment, user empowerment and collective wellbeing. In this way, the

[2] CD example is the result of employing critical design in a design process [5].

students try to solve the social problem(s) of stigma elicited by a product in an affirmative manner of design. The combination of PAMS and PIMS helped the students to produce stigma-free concepts, which they presented in the afternoon on the second day. This activity also included feedback and assistance from tutors and other students. They went home that day thinking they were going to elaborate on the chosen stigma-free design concept towards a solution over the coming three days.

2.1.2 Step 2 – EXPOSING

While the 'solving-phase' aimed to provide solutions to stigma-sensitive problems, the 'exposing-phase' was all about using critical design to identify and reveal the exact same problems that the students had attempted to solve in Step 1. They had two and a half days to turn the design process 'upside-down,' and generate CD examples[3] that embodied critique of or commentary on the design challenge chosen (i.e., product-related stigma, WS3; and human augmentation, WS4).

From lunch on Wednesday to Friday afternoon, the students diligently followed a miniature version of the traditional design process (i.e., inspiration, ideation and implementation), using the above-mentioned six stigma challenges as requirements or 'guidelines.' They presented their results in a plenary session as milestones during the process and used the critiques of their peers and the teachers to make decisions about which concept to choose and continue developing. The various teams were free to choose whatever means they wanted to present their concepts, including text scenarios, drawings, storyboards, paper or other material mock-ups, role-play or film.

2.2 Face-to-face and hybrid learning

In this section, we present the hands-on method of WS3 and the hybrid approach (i.e., face-to-face and online teaching) used in WS4 separately, before comparing them in the subsequent discussion section.

2.2.1 Workshop Series #3 (WS3) – Generating CD examples and preparing for the exhibition

During the last phase of the workshop, it was interesting to see how quickly the students adapted to their new roles as 'problem-finders.' As expected, the 'critical twist' generated some head-scratching at first, followed by an interesting 'aha moment' (by the end of Wednesday), but from then on, they quickly turned their 2D concepts into 3D models. Using all kinds of materials, artefacts and props available from the various workshops at the university and from their private homes or shops nearby, they brought their CD examples to life by the end of Thursday. It should be noted that all the teams in WS3 ended up making full-scale models, simply because the students decided that, among other things, they would 'make an impact' or 'shock people' (to quote two of the students) during the planned exhibition [8]. On Friday, the students generated titles and graphics to complement their groups' CD example in the exhibition. As shown in Figure 3, some teams went the extra mile and put the CD example in an authentic context before they documented it on camera or video as a way of showcasing the model. In doing so, they were living up to Dunne and Raby's take on CD, which advises that the viewers should experience a dilemma and makes them decide for themselves what they are experiencing and whether it is serious or not and real or not [12].

Figure 3. Impressions from Step 2 of WS3 - students working on physical models

2.2.2 Results

On Friday afternoon, the classroom was cleared and set up like a gallery, and at 6 pm the first guests – a mix of peers, partners, relatives, teachers, researchers and anyone else who had seen the advertisements for the exhibition on posters and on social media – arrived to view the five CD examples (see Figure 4). The students took turns manning the exhibition and generally attempted to avoid explaining the CD

[3] Please note that the point of the CD examples, as well as the process of designing such a CD example, is identical to that of critical design as such, namely, to raise awareness, expose assumptions, provoke actions, spark debate, etc. Or in the words of Dunne and Raby, 'to make us think' [12].

examples, instead allowing them to, in the words of Dunne and Raby, ‘make up their own mind’ [12], which is, according to them, the mark of strong critical design.

Figure 4. CD examples generated during WS3, shedding light on (from left to right): life when dependent on a fall alarm (#Fallnerable); the stigma associated with braces (#Embrace); the fear of being close to another individual (#Don’tHugMeI’mScared); the dominant role of social media in our life (#Megapixel); and Nosophobia, the irrational fear of contracting a disease (#Outbreak)

2.2.3 Workshop Series #4 (WS4) – Generating CD examples through digital means

Due to the global COVID-19 pandemic, online collaboration was the main tool during International Design Week 2021. An adjusted setup was thus organized so that the workshops could take place partly online and partly on campus. The students were only allowed on campus during predefined timeslots of a maximum of 1.5 hours per day. In total, the students spent only 6.5 hours on campus during the entire week. The online method of working was enabled by two collaboration platforms. We used Miro as a team collaboration whiteboard to share images, brainstorm and ideate, and Blackboard Collaborate to communicate and provide online consultation. Because COVID-19 also restricted the use of our craft workplace and hands-on work, students were asked to present their results in 2D posters instead of 3D artefacts. As such, they explored the critical twist through digital means, and they creatively manipulated photographs by using drawing tablets or graphic design software such as Adobe Photoshop or Illustrator (see Figures 5 and 6).

Figure 5. Impressions from Step 1 of WS4 - students’ output using graphic design software

2.2.4 Results

As shown in Figure 6, the four groups of students created 2D CD examples that, like the 3D artefacts of previous years, were meant to speak for themselves. During the exposing phase, we noticed that the hybrid way of working did not inhibit the students in making the critical twist and that the ‘aha moment’ took place just as quickly as in the preceding workshops. Furthermore, the immersion in critical design – even though it was mostly done online – made the students feel they had ‘a more critical view of the world’ and realize that they could ‘use critical design to understand a problem better’ (to quote two of the students).

Figure 6. CD examples generated during WS4, shedding light on (from left to right): city safety for vulnerable road users (#OneLessCar); the dependency of blind people (#WhoLetTheBlindOut); the feeling of endless waiting and alienation due to the COVID-19 pandemic (#Waitinglist) and stigma regarding the appearance of someone with a visual impairment (#MagnifEYEd)

Instead of an exhibition with a live audience, a virtual exhibition was presented in Mozilla Hubs, which is an avatar-embodied space that allows people to meet in a 3D environment. Four virtual exhibition rooms were created in which the posters of all twelve workshops could be found. Students, supervisors and guests were free to visit each room, view the posters and leave digital comments on the work presented.

3 DISCUSSIONS

Comparing WS3 and WS4, the difference was more than simply one between a face-to-face and a hybrid workshop. Here, we aim to elaborate on how the 'SFD + CD' applies to teaching and learning design and to further develop the workshop layout for use beyond the lifetime of the critical workshop series and towards an integration of critical design within the design curriculum. The following comparison of the two workshops provides material for both these aspects.

In each of the years, we presented students with a questionnaire at the end of the workshop. The reflections from all workshops indicate that the pedagogical shift from an affirmative (solving) to a critical (exposing) approach is generally well received and seems to work well to help students break free from their traditional thinking. To quote one of the students from WS3 [8]:

- *"By first looking for solutions to the problem, we briefly researched the chosen issue. But by totally changing direction on Wednesday, we were able to make even better and more focused critical designs, I think."*

Furthermore, students were surprised by what they had achieved by the end of the week. As a participant from WS3 said [8]:

- *"Stigma-free design will always be useful when you are working with any kind of stigma. Critical design will be used more to make a statement and maybe also to open your mind and think differently in the idea-generation phase*."

This positive attitude towards 'SFD + CD' from WS3 did not seem to change because of the shift of the hybrid teaching and learning environment. Although it is plausible that students may have been less motivated due to these unconventional times, we did not notice this in their performance throughout the week, nor in their responses to the questionnaire. Moreover, according to some of the students in WS4, when asked the following question after the workshop: 'What is the most important thing you learned from this workshop?' the responses included:

- *"By first focusing on understanding the real problem (instead of an existing solution), you can come up with more far-reaching and unique solutions."*
- *"To dwell a little longer on what problem and its social consequences you actually want to tackle with your design..."*
- *"What critical design entails and how it can be used to make people think and look at the world with a more critical eye."*
- *"[for CD] to convey a message, it should be as simple as possible, to-the-point design."*

The purpose of our pedagogic method – which entails the conversion from stigma-free design (solving) to critical design (exposing), i.e., the 'critical twist' – was to make the students look at stigma from a novel perspective. By first finding solutions to stigma-sensitive problems in a conventional manner and second illuminating the chosen design challenge in a speculative manner, they had to let go of their initial solutions and consider them differently. In short, what we wanted the students to learn in these workshops was that critical design can work as a healthy challenger to conventional design thinking – not as a replacement, but an add-on.

The results and experiences from WS3 match those from WS4. This indicates that the learning environment, whether being face-to-face or hybrid, is of less importance if the content is relevant and engaging and both students and tutors are eager to do their utmost to make it work.

4 CONCLUSION AND FURTHER CONSIDERATIONS

As mentioned above, the primary aim of WS3-WS4 was to challenge the next generation of designers concerning their way of thinking about product-related stigmas and for them to take an evolving role in shaping our future with respect to the emerging societal challenges, such as health, demographic change and wellbeing [13]. However, the pandemic radically changed the ways we live, learn and teach and forced us to take WS4 into a hybrid environment – which in retrospect was a good thing, seeing that hybrid teaching and learning might change teaching methods across the globe [14]. We hope that

someday we get the opportunity to take the critical design workshop to an even larger group of students, beyond classrooms, universities and countries.

We strongly believe that designing with a critical lens has the potential to innovate the way we teach and learn design, regardless of platforms or learning environments. Moreover, 'SFD + CD' gives us the power to express unity in diversity in a world that is increasingly complex. In addition to the methodical take-aways from WS3 and WS4 – the design methods the students were armed with to tackle the challenges of stereotypes, prejudice and discrimination – they also gained valuable experience of interdisciplinary group work, which will better prepare them for the 'real' world following university.

Despite the different platform, the hybrid version of WS4 managed to maintain both the pedagogical content and the spirit of the earlier workshops. In addition, the students reported that the 'upside-down' methodology was liberating, engaging and effective. The CD twist led the students to experience the fundamental difference between affirmative and critical design, and the feedback from the participants was almost unanimous throughout the years: despite educational background and current methods of working. Like one student said that 'you learn to look at things from another perspective or attitude', which helps in 'realizing the different needs of people to help and understand them' [7].

To this we can add a comment made by Scotland-based educator Ewan McIntosh in a TED talk some ten years ago, which we think is still highly relevant in this context: 'education systems are crazy about problem-based learning, but they're obsessed with the wrong bit of it. While everyone looks at how we could help young people become better problem-solvers, we are not thinking how we could create a generation of problem finders' [15]. We could not ask for a better outcome.

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