TEACHING DESIGN FOR VALUES

CONCEPTS, TOOLS & PRACTICES

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TU Delft OPEN

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

SUMMARY

VALUES ARE AT THE CORE OF DESIGN'S ACCEPTABILITY, SUITABILITY, AND SUSTAINABILITY.

&ROBERTO ROCCO, AMY THOMAS, & MARÍA NOVAS-FERRADÁS

The process of identifying, interpreting, and implementing societal values in university education is an essential part of responsible innovation and designing for equitable, inclusive and sustainable societies. While there is now a well-defined and growing body of literature on the theory and application of designing for values (or 'value sensitive design'), at present there are few comprehensive studies that address the pedagogical dimension of designing for values; the issues, methods and critical approaches involved in teaching design for values. T*eaching Design for Values: Concepts, Tools and Practices* comprises 14 chapters written by both TU Delft educators and international contributors, addressing teaching design for values in a variety of design-based disciplines. The multi-disciplinary character of this book makes it a valuable resource for teachers and students of design. *Teaching Design for Values* also proposes an expanded definition of 'design' to encompass a broad range of disciplines and processes. In doing so it explores the ways that values may be expressed and analysed in a variety of different pedagogical contexts.

TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

CONTENTS

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A WORK OF MANY HANDS

AMY THOMAS, MARÍA NOVAS-FERRADÁS & ROBERTO ROCCO

This book would never have been realised without the support of the Delft Design for Values Institute (DDfV), the TU Delft platform for the discussion of values in design and responsible engineering. TU Delft and colleagues at DDfV are acutely aware of the role of the university as a place where the leaders of tomorrow develop their values to promote positive change.

We are immensely grateful to the authors of this book, who generously agreed to share their knowledge with us and who dare to explore the issue of values in design education, sometimes against the odds of doubting colleagues and institutional conservatism.

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In conclusion, we would like to express our deepest gratitude to our students, who continually motivate us to do better.

TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

'IN DESIGNING TOOLS WE ARE DESIGNING WAYS OF BEING—WAYS OF BEING WITH MORAL AND ETHICAL IMPORT' (FRIEDMAN AND HENDRY, 2019, P. 1)

INTRODUCTION: WHY TEACHING DESIGN FOR VALUES?

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The process of identifying, interpreting, and implementing societal values in university education is an essential part of responsible innovation and designing for equitable, inclusive, and sustainable societies. While there is now a well-defined and growing body of research on the theory and application of designing for values (or 'value sensitive design'), at present the pedagogical dimension remains underexplored. *Teaching Design for Values: Concepts, Tools and Practices* is a resource for teachers of design-based disciplines who wish to foreground values more explicitly in their classes. With fourteen chapters written by both TU Delft educators and international contributors, the book aims to examine the concepts, methods, and experiences of teaching design for values within a variety of fields, including urbanism, engineering, architecture, artificial intelligence, and industrial design.

Through its multi-disciplinarity, *Teaching Design for Values* proposes an expanded definition of design to encompass a broad range of disciplines and processes that deal generally with 'future-imagining' and 'future-building,' including process management. In doing so, it explores the ways that values may be expressed and analysed in a variety of different pedagogical contexts. This book presents the

results of a two-year project starting in February 2020 with the 'Teaching Design for Values' workshop organised at the Faculty of Architecture and the Built Environment at the TU Delft. This workshop was but a small part of a much broader concern for teaching for values at TU Delft, most notably represented by the **Delft Design for Values Institute**, a cross-faculty platform for the growing number of researchers and educators who put values at the centre of knowledge production and education. As is evident through the work of groups like the Department of Values, Technology, and Innovation (VTI) at the TU Delft Faculty of Technology, Policy, and Management, which brings together expertise from economics, safety science and philosophy, topics like responsible innovation are increasingly essential components of a design education. And for a good reason. Paraphrasing Parvin, values are at the core of design's acceptability, suitability, and sustainability (Parvin, 2018), and fundamental to continued technological innovation. As the VTI group note,

> The choice should not be between foregoing a potentially helpful innovation or pushing it through despite justified concerns. Rather, the responsible innovation approach pays attention to important values, in the design as well as in the implementation of technological innovations, and in the institutions that govern them. (VTI, 2022, no page)

This renewed attention to values in education and research begs the question: *what are values and why are they so important for design and management?*

We often forget that values are about 'valuing' alternatives, choosing options and courses of action. Values inform us about how to lead our lives and about which choices to make, as well as how to value the claims and choices of others. There is no apparent reason why values should not play a role when we 'value' options in design and management. The question must be reformulated. It is not about whether values should play a role in design and management, __values are always consciously or unconsciously implemented__, but rather about *whose* values should be represented, and *how* can the design process make sure the values of a wide range of stakeholders are present. As a growing number of justice advocates would argue, it is also about making sure the values of vulnerable or silent stakeholders are sufficiently given attention to, which is in itself a values-based decision. In this sense, valuing design options has an acutely interpersonal and political nature. Here, the issues of communicative rationality and public justification, discussed by Roberto Rocco in Chapter 2, come to the fore. Of course, individual, or personal values do matter. But it is how we decide to evaluate options collectively, sometimes publicly, in communicative exercises and practices, that matter

perhaps the most, as design and management shift from an authorial paradigm towards a perspective that focuses on co- and collaborative design.

This is in stark opposition to ideas of neutrality in science, largely debunked, but stubbornly persistent in design and engineering education. The neutrality bias is the idea that academics and educators should be 'neutral,' somehow apolitical, and purely 'objective.' This so-called 'view from nowhere' or the 'God Trick' in the words of the philosopher Donna Haraway (1988), is impossible to achieve in reality, as everyone is located *somewhere* (historically, socially, physically, morally, politically, and so on), starting from gendered and racialised human bodies as the first territory of dispute (Haesbaert 2020). This 'view from nowhere' is in itself a bias, as it conceals support or endorsement of the status quo, perpetuating ingrained (and consequently unconscious and implicit) biases. One reason for the neutrality bias in education comes from the epistemological paradigm in the so-called 'hard' sciences. Historically, subjects like physics and mathematics were largely seen as 'neutral,' a concept that is now challenged. Paul Ernest in his book *The Philosophy of Mathematics Education* declares that 'if mathematics is considered 'neutral,' then it can bear no social responsibility', meaning that 'the underparticipation of sectors of the population, such as women; the sense of cultural alienation from mathematics felt by many groups of students; the relationship of mathematics to human affairs such as the transmission of social and political values; its role in the distribution of wealth and power; none of these issues are relevant to mathematics' (Ernest, 199, p. xii). But Ernest sees a big paradigm change in course—what he calls a 'Kuhnian Revolution', after American philosopher of science Thomas Kuhn—as an increasing number of mathematicians and philosophers are challenging the two-thousand-year-old notion of mathematics as 'a body of infallible and objective truth, far removed from the affairs and values of humanity', in favour of a characterisation that is 'fallible, changing, and like any other body of knowledge, the product of human inventiveness' (Ernest, 1991, p. xi).

On the other hand, scientific ethical codes of conduct like the Mertonian norms of 1942 suggest a certain degree of neutrality in concepts like universalism and disinterestedness, particularly connected to the validity of methods and the soundness of results. Disinterestedness, for example, supposes a researcher will not procure personal gain in shaping their methodology or in elaborating results. But being disinterested is very different from being 'neutral.' There is a confusion between disinterestedness and universalism on one hand, concepts connected to values such as scientific integrity, thoroughness, diligence, and a self-critical stance, and on the other hand, the idea that scientists and science itself are, or should be, 'neutral.' Even the very idea of objectivity as truth independent from

individual subjectivity seems to be misunderstood as an impossible detachment from one's socio, cultural and political context.

Ernest proposes looking at science as a 'process of inquiry and coming to know, a continually expanding field of human creation and invention,' (p. xii) limited by our human abilities and senses and circumscribed by our cultural and social environments. In science, concepts like ethics and scientific integrity play a determining role, but the knower is always situated historically, socially, and physically. If one sees science as a dynamic process of inquiry, then education has a completely different character, much closer to understanding the learner as an active and situated agent in knowledge production, not a mere vessel where 'neutral' knowledge is to be poured into. In this sense, David Roberts, Vanessa Zadel, Carolina Quiroga, Elizabeth Arenas, Kees Pieters and other authors in this book all claim for encouraging students to confront their own positionality, and face their own biases, power, and privilege, to be able to reflect and 'value' the choices ahead.

The reflections contained in this book point to several pathways to understanding the 'value of' and the 'values in' design and design education. Salient among these pathways is the realisation that the value of design must be understood broadly, beyond its immediate effects on direct users, to consider how design affects 'health, happiness, democracy, and ecologies,' in the words of Lise Magnier and Charlotte Kobus (chapter 6). This position demands a more systemic, structural, and holistic evaluation of the 'value of' design and its effects on and consequences for distant stakeholders. For example, in understanding how the materials used for a certain product may affect the political and /or ecological stability of countries where those materials are abundant, or the effects of certain digital technologies for individual freedom, privacy and democracy. There is also a realisation that exploring values in design demands 'collective exercises' in which these values may be examined intersubjectively in co-design and communicative exercises. In other words, rather than embedding their own values into design, designers ought to explore the collective and societal values sought by wide coalitions of stakeholders, sometimes beyond the immediate 'vicinity' of design.

There seems to be consensus among a number of authors in this book around the idea of self-exploration of values and the 'self-awakening' of young designers towards the complexity of design for values, including the ideas explored by Elizabeth Arenas and Kees Pieters in chapter three. This is consistent with ideas by the Brazilian philosopher of education Paulo Freire for whom education should be built upon the values and the knowledge of learners as much as the educators, and where educators are also learners (Freire, 2018 (1968)).

1. CONCEPTS

The first section on ‘Concepts’ explores the issues described above. It opens with a critical text by Taylor Stone. Stone investigates the applicability of value sensitive design (VSD) and design for values (DfV) with a focus on urban technologies, but not before highlighting their 'vague articulation of values.' Taylor wishes to investigate 'how can we properly appreciate the value-laden nature of technological innovation within the context of urban planning and design,' and in doing so, explores the values of urban technologies, searching a possible foundation for VSD and DfV, in the appreciation 'that technology and society co-evolve, which will continually change the definition or prioritisation of values.' Taylor goes on to develop an analytic framework in the form of six heuristic principles (principles that enable someone to discover something by themselves) that can be used to reveal values in urban technologies, which the author believes can help advance our understanding of the iterative relationship between technology and design, society, and values. It is this relationship that many of the authors in this book seek to explore using the lens of education.

Next, Roberto Rocco investigates why a reflection on justice ought to be part of a planning and design education, a concern that can be extended to other areas of design practice. Rocco’s argument, following political and moral philosopher Alasdair McIntyre, is that justice is an 'internal and necessary good' for the successful practice of spatial planning, without which it is 'meaningless.' Rocco pursues principles of public reasoning and public justification to argue that spatial planning can only be publicly justified if it delivers just outcomes through just procedures. The author rejects the idea that justice is subjective, instead arguing that different justice claims must be decided through public communicative exercises, of which spatial planning is but an expression. The author fully acknowledges that competing justice claims are often valid in themselves and follows Indian economist and political philosopher Amartya Sen in claiming that competing justice claims can be compared and measured against it other, via public communicative exercises, to deliver justice valuations that allow us to go forward. Rocco reminds the reader, always following Sen, that it is not about delivering perfect justice every time, but about making the world more just today than it was yesterday or increasing justice and decreasing injustice. To discuss these issues in the classroom, Rocco proposes four exercises that address public communicative rationality in justice claims and reminds the reader that 'there is value in listening to the arguments of all the members of a community' so that we can collect all arguments available to be able to make decisions.

The third chapter by Elizabeth Arenas Thomas and Kees Pieters is a powerful plea for designers to reflect upon two main questions: 'Is design ever value free? And whose values shape design?' The authors use the notion of decoloniality to urge designers to understand that 'Western knowledge is hegemonic, it is exported as if universal and as if neutral, and therefore defines design in the modern world according to one set of values.' By ignoring this, designers risk reproducing the existing structures of oppression. The authors seek a 'detachment of the Eurocentric base of power, the disengagement of the logic of modernity and the rise of alternative epistemologies' through the notion of *conscientização*, a pedagogical philosophical concept proposed by Paulo Freire that describes 'the process of self and societal awareness that all educational projects should have at their heart to uncover social, political, and economic injustices.' Thomas' and Pieter's text explicitly acknowledges the political nature of design, thus proposing a decolonial design practice through the construction of design stories though which designers interrogate themselves and their own practices. This process of self-interrogation through practice is what *conscientização* proposes. *Conscientização* is a type of 'self-awakening' though continuous critical interrogation of the world and one's practice in it. In this text, design, society, and values are framed within the great narrative of Western primacy, which the authors challenge and interrogate though their design stories. The text is personal and talks to the reader directly through dialogue boxes that invite readers to interrogate their practices.

Chapter four is by Kees Pieters, also a co-author in the previous chapter. Pieters addresses the urgent subject of values and Artificial Intelligence (AI) by noting that 'the ethical discussions regarding this technology tend to be philosophical or sociological, and only rarely manage to inspire those who are actually shaping this technology.' Pieters sets out to do just that by interrogating AI from a variety of scenarios, pointing at the important limitations to AI currently despite its 'promise of autonomy.' It is this promise of autonomy and its connection with values that deserve most attention in Pieter's text, with all the implications for how AI will, in the future, express values. Pieters has a breakthrough when comparing AI to another kind of semi-autonomous system: the so-called 'free-market,' in which the author sees an implicit belief that 'collective behaviour creates a form of artificial intelligence that supersedes human capabilities.' The implications of this connection cannot be overestimated. It is possible that in the future the belief will arise that AI should not be interfered with or limited, just like neoliberal ideology today asserts that the free market should not be interfered with or limited by governmental action, lest the market will not be able to 'function properly'. Indeed, current blind belief in the laws of the market make one ponder what will

happen when we have yet another ‘value-free’ semi-autonomous system with the promise of infallibility guiding our lives. The author uses this argument to explore the problems of neutrality, objectivity, and universality in science. Pieters proposes an 'intermediate language, a *lingua democratica*, that tries to stay close to the background and training of designers of artificial intelligence, but at the same time invites them to engage in critical reflection on their practices, and the artefacts they design.' Pieters concludes by pondering that 'the ethical reflection that is truly characteristic of AI is likely to be limited, owing to the limited autonomy of current technological artefacts,' which 'puts the ethical accountability squarely in the realm of the designers of those artefacts,' making it urgent 'to stimulate the means of ethical reflection in the early stages of the design process.'

In Chapter 5, Matthew Dennis critiques ethics education for engineering students, who are customarily introduced to the ‘five-systems model’, which introduces different models of ethical evaluation and 'shows how the application of different moral theories affects how we think about design dilemmas'. For the author, these approaches are interpreted by young engineers as 'system of constraint to new and innovative design' prompting engineering students to regard these systems (if not the entire mandatory course itself) with a mixture of boredom and hostility.' The author argues that 'many key ethical topics can be more effectively taught by encouraging students to identify positive ‘ethical exemplars’ of digital well-being from today’s popular culture' to propose a new approach to teaching ethics in engineering, 'one that puts a 21st-century conception of digital well-being at the centre of engineering ethics', giving 'students a unique and powerful access point to the ethical considerations to which their designs should respond'. The chapter sketches 'a process through which students can evaluate existing products and services according to whether they actively promote (or are compatible with) their justified ethical ideals', by asking engineering students to 'justify their choice of ethical exemplars' in a guided step-by-step exercise that involves 4 steps: (i) identification of ethical exemplars, (ii) identification of their character traits, (iii) conversion of those traits to values and finally (iv) translation of values to desired recommendations. This approach resonates with the search for self-reflection and self-awakening sought in other chapters of this book, and uses an innovative, unexpected tool based on current student’s digital experiences to build a framework that allows them to pursue positive ethical examples, rather than feel constrained by them.

The section on concepts closes with a chapter by Lise Magnier and Charlotte Kobus, who challenge the teaching of industrial design fundamentally by pointing out that a focus on economic value has pushed the planet to a tipping point. The authors consider that although it may be argued this focus on efficiency and

economic value has lifted many out of severe poverty, it has also created more inequality and imposed severe burdens on the environment. Magnier and Kobus call on industrial designers to 'do better' and to reflect on the impact of their designs on 'health, happiness, democracy, and ecologies' and the far-reaching consequences of their designs not only for their users and clients. The authors make appeal to Bos-de Vos for whom 'consciously thinking about ‘value’ and ‘values’ in all their meanings might assist designers in opening up discussions about values and interests, address tensions, and increase the probability that those involved can collectively work towards a broadly valued end result'. This ‘collective work’ and discussion on the value and values of design takes us back to public rationality and public justification of those values, and to the idea that the ‘value’ of a design must be assessed far beyond its immediate effects. The authors sketch a pathway for (collective) reflection that takes us into a journey of unpacking, codifying, explaining, and making values explicit in communicative exercises. 'Stimulating students to conduct high-quality dialogues between these collaborating actors might help them resolve these tensions while making them more aware of their own values.'

2. TOOLS

If the first section reminds us why value sensitive design is necessary, and what themes, topics and concerns teachers might address, then section two explains how this can be done. What are the tools and methods that make values knowable and explicit in the design process? How can teachers and students work together to formulate new kinds of knowledge? Through what means can institutions support educators and students in reformulating their curriculums? In this section, four chapters address these questions in the fields of architecture, education studies, management in the built environment and the ethics of technology.

Designing for values at its core requires students and educators to re-evaluate what we already know, to confront the status quo, and to reimagine new ways of thinking and creating. It demands a fundamental reassessment of the canons of knowledge, but also the practice of teaching. In his chapter, David Roberts argues that encouraging students to be aware of their own positionality in their disciplines is a critical aspect of radical pedagogy. Using workshops taught in the UK and Denmark as cases, Roberts examines how the act of debating, drafting, and declaring manifestos offers an opportunity to disrupt the conventions of classical architectural design education, and to make space for students to think otherwise.

'The act of drafting a manifesto involves both working through and working towards ethical principles and situations' writes Roberts. By reading aloud historical architecture manifestos, editing, and re-writing them, first as individuals, then as a collective, students are asked to actively confront existing paradigms and to develop their own responses and opinions in relation to them. Drawing on manifestos from diverse geographical and cultural contexts, the workshops analysed in this chapter encourage students to question their academic heritage and consider other perspectives and ways of knowing. Through this process, Roberts argues, the students learn ideas and methods 'essential to developing ethical built environment practice, from positionality and situatedness, to reflexivity and relationality.' But these exercises don't simply ask students to consider their own place in architectural practice and research. The collective process of saying and writing powerful statements together, as a collective, also subverts the individualising tendencies of the profession and the neoliberal university, giving value to collaboration over competition.

In promoting the teaching of value sensitive design, we explicitly ask educators to adapt the way they teach by positioning values explicitly at the fore. One of the biggest hurdles to institutional change is that it requires simultaneous top down and bottom-up approaches; teachers need to develop new curricula, whilst universities need to offer the time, tools, and resources for them to do so. As Rikke Toft Nørgård, Elisabet Nilsson, Eva Eriksson & Daisy Yoo write in their chapter, this requires a 'double pedagogical framework': a system that teaches the students how to design for values, whilst also educating the teachers how to teach it. Setting out a model for such as system, in the form of the 'VASE Framework', the chapter meticulously details what it takes to develop a pedagogical structure that simultaneously helps develop the 'knowledge, skills and attitudes that students need in order to consider the broader context and implications of design and design processes, and through this the possibility for them to become more responsible designers,' and also enables the teachers to create such a curriculum. The VASE framework is not about telling teachers exactly what to teach, but rather about giving educators an 'inspirational repository of various resources for teachers to explore, experiment with and integrate' in their own specific contexts.

Designed to be used across multiple disciplines, each with its own conception of 'design', they create a system with shareable resources that is adaptable to each context. But in order to provide a framework that works across multiple disciplines, there must, perhaps paradoxically, be a consensus on the core foundations of an education in value sensitive design. For Nørgård et al., this is expressed in the three 'pillars' upon which the entire framework rests: 'Ethics and Values', 'Design and Technology', and 'Designers and Stakeholders'. Through their own educational

design research in a European consortium, the authors recognised these foundations, arguing that they provide the necessary skills and knowledge for students to become responsible designers, whilst also tending to various parts of the design process. Within these areas, teaching activities are specified, with instructions and educational kits including lecture slides, prompts, selected readings and more, which the authors believe enables teaching without too much extra preparation. All of this is available through a digestible and well laid-out online platform.

The process of taxonomising, categorising, diagramming, and mapping emerges as a core methodology in the context of value sensitive design.

As Theo van der Voordt writes in his chapter on the management of buildings and facilities, and Udo Pesch writes in his chapter identifying interventions for responsible technological innovation, by breaking down the design, implementation and use process into stages, students are able to better understand the explicit moments in which values play a bigger role, and how those steps might be adapted or changed. For Van der Voordt, the creation of a taxonomy of added value in corporate real estate helps designers understand where the conflicts and synergies arise between the aim to 'support (…) organisational, individual, and societal objectives, and the costs and sacrifices that are needed to attain the aimed benefits.' Focusing on adding value from the perspective of clients, end users, and other stakeholders, Van der Voordt identifies twelve leading 'value parameters': 'four people related values (satisfaction, image, culture, health and safety), four process and product related values (productivity, adaptability, innovation and creativity, risk), two economic values (cost, and value of assets), and two societal values (sustainability, corporate social responsibility.' Through this process of identifying specific values, Van der Voordt argues that it is possible to show students how to support those values through management choices, and how to measure them. As different values may alternatively conflict or strengthen each other, the purpose is to show students that design processes should not only identify values, but also establish which values to prioritise, and how to operationalise values through design choices. In the educational context, this takes place through applying parameters to specific case studies, as students write accommodation plans for a client in practice.

In the field of technology, Udo Pesch argues that students should go beyond identifying different stakeholder values, and to understand their relationality. In his proposition of the 'Socio-Technical Value Map' as a tool for finding interventions for responsible innovation, Pesch argues for the necessity of context and complexity when teaching value sensitive design. The deep embeddedness of technology in society—as something that is simultaneously produced by and for people and institutions—means that its development must not exist in a vacuum. The explic-

it recognition and uptake of values should be at the core of the design process. But this can only happen if that process is fully and comprehensively understood, or 'mapped.' For Pesch, determining who the stakeholders are and what are the values at play is just the first part of this mapping process; understanding the ways in which those values are subsequently 'designed into' technology is a vital second step. Only by knowing this, can designers engage in the third step of 'intervening' to make technology more ethically sound. Through this mapping exercise, students are encouraged to design in a way that positions technology within its societal context throughout the development process, or, as Pesch puts it, 'to reconstruct a sociotechnical public.' Mapping the technology, stakeholders, values, and possible interventions, is thus a mode of designing with and for values explicitly, rendering the designer more accountable.

3. PRACTICES

The final section 'Practices' describes contemporary situated teaching practices that seek to start or consolidate cultural change. While the first two chapters explore this question in Western Europe—with a particular focus on the Faculty of Architecture and the Built Environment at the TU Delft—the final two chapters, respectively written in Argentina and Peru, incorporate relevant innovations taking place in the Spanish speaking world. Consolidating this desirable transnational perspective, the second chapter combines a international pedagogical initiative which also combines fieldwork and teaching techniques in English and Portuguese. While some of these chapters were originally written in Spanish, we made a conscious effort to incorporate them in the book and encouraged authors to translate their experiences into English. This was so that a much broader readership could have access to experiences in Latin America, as these tend to remain 'in the margins' and be seen as 'exotic,' which defeats the purpose of creating an epistemology beyond Western paradigms, that is both diverse and inclusive.

All cases are (unfortunately, one might argue) examples of 'alternative' practices, which are explicitly and intentionally value centred. They have been envisioned from topics like feminism, ableism, and cultural heritage. They all encourage, albeit from different perspectives, a high degree of learners' involvement. Thus, following ideas by Maja van der Velden and Christina Mörtberg (in van den Hoven et al., 2015, p. 45), these teaching practices could be understood as situation-based ac-

tion that encourages mutual learning, since: 'in doings and actions, individually or collectively with other people and technology, skills and knowledge are shared and gained. Thus, design is always performed somewhere by humans and non-humans; their activities do not take place in isolation but are embodied and situated.'

The four chapters address the fields of architecture, heritage, and urbanism and emphasise the social and material implications of designing for the built environment. This is a topic of the utmost relevance in a world besieged by multiple interconnected challenges while urbanising rapidly, as of course of the utmost interest to the editors of this book. As Professor Lara Schrijver has written, architecture is produced and later reproduces cultural values: 'Historically, architecture is understood to embody values on two levels. On the one hand, there is the unconscious embodiment of the accepted values of a society. On the other, there is the intentional inscription of values that the architect or patron believes should be held.' (Schrijver, in van den Hoven et al., 2015, p. 592).

Following Schrijver, there are two dimensions to explore: the unconscious contemporary societal, cultural and political values that still determine the spatial organisation of buildings, and the role of the built environment as a tool to transmute and transpose those value systems beyond the 'fallacy of physical determinism' conceptualised by Herbert Gans in the 1960s. In this sense, we also understand 'architecture to not only guide our behaviour, but in so doing, to shape our values' (Schrijver in van den Hoven et al., 2015, p. 591). Yet, we could expand Churchill's statement 'First, we shape our buildings and then our buildings shape us' to any designed artefact. As the conceptualisation of value-sensitive design has theorised:

> *...technology and human experience are together, with one shaping the other. In this mutual shaping, we observe that neither moves forward on its own, nor is technology value neutral. Thus, design process matters. For researchers, designers, and engineers, at stake is nothing less than human dignity and just societies. (Friedman & Hendry, 2019, p. 180)*

Thus, in chapter 11, 'More than Half of the Picture', Amy Thomas and María Novas-Ferradás, share their experiences on the 'methodological and epistemological challenges at the encounter of feminism and architectural history at the TU Delft'. Through the specific example of two interlinked courses on Architectural History in the first year's master's track on Architecture, Urbanism and Building Sciences, the authors document the institutional and cultural transformations and struggles that made progressive change in the curriculum possible, and allowed for the explicit focus on 'feminism' achieved in one of the seminars organised. Despite the

risks associated with the experimental character of both curriculums, the case navigates the authors' commitment to 'progress, not perfection' (Friedman & Hendry 2019, p. 17), through advocacy in education, incremental and positive change. This chapter also contributes to documenting feminist activism in the school, and the struggles to make 'more than half the picture' visible.

In chapter 12, Bruno Amaral de Andrade and Ana Roders introduce game-based learning as a novel and innovative method for identifying, discussing, and designing heritage values. Gamified Learning Environments (GLE) have a double function of making citizen participation simultaneously more engaging and more accessible, while encouraging citizens to understand their right to heritage. In this chapter, de Andrade & Roders address the opportunities and challenges of GLEs 'for learning over heritage values and citizen engagement in architectural design' in two courses on heritage in the bachelor's and master's levels in the Architecture track at the TU Delft. De Andrade & Roders explore the immense power and appeal of serious gaming to address 'more complex interconnected social issues', to raise awareness and 'encourage creative expression and critical thinking, integrating data and stories from real contexts'. The advantages of GLEs vastly outweigh the disadvantages, to allow better cognitive development, accessibility, interaction, exploration, representation of physical features and finally design of heritage. All these aspects are explored by de Andrade & Roders in practical and engaging exercises in which students are invited to reflect about heritage values and heritage as a right. For the authors, GLEs are 'successful in supporting students as well as other stakeholders to better understand the cultural significance (values and attributes) of heritage assets in the redesign process.'

In chapter 13, Carolina Quiroga from Argentina introduces the remarkable Feminist Architecture Workshop LINA, a pedagogical experience using inclusive values from a gender-based perspective to challenging design paradigms. LINA is a experience and started to take shape in 2020, during the COVID 19 pandemic, as a 60-hour virtual elective followed by students from several universities around Argentina and a few other countries in Latin America. Through lectures, virtual tours, and practical workshops, LINA boosts a collective construction of knowledge while critically challenging the traditional values that guide spatial design in Latin America. It does so by creating a sisterhood of designers inspired and guided by luminaries of feminist thought and activism in Latin America, such as Argentinian architects Ana Falú and Zaida Muxí. LINA seeks to recover and highlight the political dimension of architecture and includes 'cultural itineraries' that tell the story of the transgender community and LGBTQI+ movements, seeking intersectionality. This experience is akin to a social grassroots movement, in which women

architects around Latin America come together to challenge deep-seated assumptions in architectural design and education. Remarkably, during the process of publication of this volume, the LINA Feminist Architecture Workshop was selected as a finalist at the 12th Iberic-American Architecture and Urbanism Biennial, in the category 'Educational Programmes.'

Vanessa Zadel closes this volume. Zadel leads a unique design studio at the Universidad de Lima, in Peru. In her course, students explore their embodied experience as users of architecture and go further by developing empathy towards people with physical disabilities through a series of practical exercises and experiences that inform them about other ways of experiencing architectural space. This implies at times restricting students' mobility, vision, and hearing, to simulate disability experiences, which is done carefully and with help from organisations that work with people with disabilities. Based on this experience, Vanessa argues that putting oneself in other people's shoes is a key aspect of professional architectural accountability, and asks the reader, rightfully, whether attention to users should be an integral part of architectural education from the outset. The author's experience is beautifully simple but also powerful in creating empathy and a sense of accountability. Reading about her course, one is forced to wonder: why don't we have more experiences like this, and why are users almost an afterthought in many architectural courses? As a result of the course, students gain confidence and awareness in their design decision-making processes and learn how to communicate their designs in a more inclusive way.

To sum up, In our endeavour to discuss the complexity of teaching design for values, we make recourse to Friedman and Hendry, for whom

> *Technology is the result of human imagination—of human beings envisioning alternatives to the status quo and acting upon the environment with the materials at hand to change the conditions of human and non-human life. As a result of this human activity, all technologies to some degree reflect, and reciprocally affect, human values. It is because of this deep-seated relationship that ignoring values in the design process is not a responsible option. At the same time, actively engaging with values in the design process offers creative op*portunities for technical innovation as well as for improving the human condition (Friedman and Hendry, 2019, p. X).

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MIND MAP BY TU DELFT STUDENTS. PHOTO BY R. ROCCO. PRINTED WITH PERMISSION.

TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

SECTION

1

CONCEPTS

TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

DESIGN FOR VALUES & THE CITY*

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ABSTRACT

This paper undertakes a critical and constructive investigation into the applicability of value sensitive design (VSD) and design for values (DfV) methodologies for urban technologies, as a means to envision and enact responsible urban innovations. In particular, this paper focuses on the identification and analysis of values in urban technologies. First, an important methodological critique is highlighted, namely the vague articulation of 'values' in VSD and DfV discourse. Next, cities are characterised as open, dynamic, and evolving systems, with 'urban technologies' as co-shapers of this process. This highlights the unique conditions requiring attention in order to arrive at a robust understanding of the relationship between values and urban technologies. Finally, these insights are combined to propose and sketch six heuristic principles aimed at surfacing and analysing values in urban technologies, offering a refinement of value-sensitive methodologies for the context of urban technological innovation.

DESIGN FOR VALUES, VALUE SENSITIVE DESIGN, RESPONSIBLE URBAN INNOVATION, PHILOSOPHY OF THE CITY, SMART CITIES, NIGHT-TIME LIGHTING

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STONE, T. (2021). DESIGN FOR VALUES AND THE CITY. JOURNAL OF RESPONSIBLE INNOVATION. HTTPS://DOI.ORG/10.1080/23299460.2021.1909813 THE PRESENT VERSION INCLUDES MINOR CORRECTIONS AND MODIFICATIONS TO MATCH THE VOLUME'S STYLISTIC GUIDELINES. IT IS REPRINTED HERE WITH THE PERMISSION OF THE AUTHOR, AND IN ACCORDANCE WITH THE TERMS OF THE CREATIVE COMMONS LICENSE.

1. INTRODUCTION: THE MEDIUM(S) OF THE CITY

In Electric Light: An Architectural History (2018), historian of architecture Sandy Isenstadt introduces the concept of 'electric modernism.' Isenstadt argues that electric light was foundational to the changing design and use patterns of homes, factories, automobiles, and public space throughout the 20th century. Because of this far-reaching influence, electric lighting is not positioned as a secondary or peripheral influence, but as formative to the physical and ideological conditions of the last century. 'If modernity itself can be characterised by rapid, incessant change – and modernism as the creative and conscious response to such change – then electric light – instantaneous, malleable, ubiquitous, evanescent – is modernity's medium' (Isenstadt, 2018: 11).

Isenstadt's account of electric lighting can be read as much more than a rich historical description; he argues that the proliferation of, and successive innovations to, a specific technology effectively co-shaped 'modernity.' Electric light's influence extended well beyond its primary technical functions, coming to shape – and be shaped by – the social, economic, and political landscape of the early 20th century. And, the influence of artificial illumination will arguably continue throughout the 21st century. Via the wide-scale adoption of LEDs and 'smart' lighting, we are in the midst of a shift from electric to electronic lighting (Gandy, 2017), which will undoubtedly impact urban nightscapes over the coming decades. Underlying Isenstadt's analysis is therefore a normative claim relevant to considerations of urban technological innovation: in acting as the 'mediums' of urban spaces, technologies such as lighting co-shape the fabric in which we live, co-constituting our experiences, perceptions, and behaviours.

Accepting the formative role of urban technologies in our urban life worlds, at issue in this paper is the analysis of urban technological innovation. This is a practical question with applicability to urgent problems, but also a conceptual question. On what theoretical grounding are we analysing urban technologies as constitutive mediums of our urban spaces? And critically, how can we properly appreciate the value-laden nature of technological innovation within the context of urban planning and design? By advancing these theoretical questions, this paper contributes to the refinement and advancement of responsible urban innovation – how technologies can be used to address specifically urban challenges (Nagenborg, 2020). This is important to consider for at least two reasons. First is the increasing attention paid to cities and public space from within the philosophy of technology, catalysed by the emergence of the 'smart city' (e.g., Nagenborg et al., 2021). Of particular interest are the ethical issues created by these innovations and associated ideologies. This includes, for

example, the evolving role of the public sphere brought about by the notion of the 'experimental city' (Pesch, 2021), as well as the myriad of ethical concerns raised by living labs and smart urbanism (e.g., van der Sloot & Lanzing, 2021). However, as I will argue below, the ethics of smart cities can benefit from a re-orientation towards the ethics of urban technologies. This reveals the social and technical histories, as well as the contextual specificities, within which urban innovations will be embedded. Second is the growing acknowledgement that cities deserve increased attention from practical philosophy as a whole, as they are focal points for many of the social and ecological challenges facing the 21st century. In this broader sense, this paper can be positioned as a contribution to the burgeoning field of philosophy of the city (e.g., Lehtinen, 2020; Meagher et al., 2020; Simon, 2021).

With these broader trends in mind, this paper specifically explores how the theories and practices of value sensitive design (VSD) and design for values (DfV) can be applied to the city; or more precisely, to the analysis of urban technologies. While value-sensitive approaches are often advocated for in literature on responsible innovation, the full potential of VSD and DfV as universally applicable approaches to technology design has yet to be realised. 'It remains an open practical question how (if at all) the theory and method of value sensitive design developed primarily with information technologies will need to be adapted or extended to account for moral values in the design process of other non-information technology' (Friedman & Hendry, 2019: 21). Yet despite the relative nascency of these methodologies, recent years have seen their exploration and application to a variety of domains (e.g., van den Hoven et al., 2015). Relevant to the current inquiry, this has included analyses focused on architecture (Schrijver, 2015; van den Hoven, 2013), housing (Elsinga et al., 2020), energy controversies (Dignum et al., 2016), and public participation in urban planning (Friedman & Hendry, 2019). However, a focused consideration of how VSD and DfV methodologies can be operationalised for the scale and problems of urban technologies has yet to be explicitly undertaken.

As the physical structure of cities, urban technologies inevitably mediate the social, political, and even ecological processes essential to cities and city life. That they are value-laden (purposefully or unreflectively) should be seen as a fundamental component of urban technologies. However, the ontological characteristics of cities also point towards a need to refine how we approach the ethics of urban technologies; and, how we identify, analyse, and operationalise values in urban technologies. As has been argued elsewhere, dominant approaches to responsible innovation risk treating values as ready-made; something 'out there' that is immediately knowable and available for deliberation – what Boenink and Kudina (2021) refer to as an 'entity trap.' Instead, Boenink and Kudina advocate an in-depth hermeneutic approach to identifying values, towards improving the theory and practice of responsible innovation. Further, recent work within philosophy of the city has argued that urban tech-

nologies – and especially urban infrastructures – require a modified approach to their moral appraisal (e.g., Epting, 2016a; 2016b; 2017; Nagenborg, 2020). Urban technologies, such as electric lighting, are complex systems with multifaceted impacts, functional and symbolic dimensions, and a far-reaching temporal resonance. Further, they can affect millions of people over multiple generations in varying ways. This necessitates a refined framework that is responsive to the unique aspects of urban technologies. At a theoretical level, this requires a solid conceptualisation of 'values' in urban technologies, and a means to surface and analyse said values.

The goal of this paper is therefore twofold. First, to conceptualise the category of 'urban' technologies, in relation to the characterisation of cities as open and evolving systems. Second, to use this categorisation to develop an analytical framework for surfacing values in/of urban technologies. For this, six heuristic principles are outlined that serve to elucidate value-level considerations in urban technological innovation. The application of these principles is exemplified via a running case study of urban night-time lighting. With these principles in hand, we can take first steps towards establishing a design for values of – and for – the city.

2. ETHICS BY DESIGN: THE PROMISE AND CHALLENGE OF DESIGNING FOR VALUES

Before moving into the domain of urban technologies, it is useful to ground this inquiry by briefly reviewing the basic tenets of VSD and DfV, as well as a key methodological challenge. At least since Langdon Winner's 1980 article 'Do Artifacts Have Politics?' – in which he argued, among other things, that technical artefacts can embody and/or advance political ideologies – ethicists of technology have been pre-occupied with the relationship between technologies, politics, and values. In addition to ongoing theoretical discourse, this has spurred practical approaches aimed at incorporating moral values into the development and design of technologies. An early – and arguably foundational – approach is the framework and methodology known as value sensitive design (VSD). Originating in the information technology domain and developed by Batya Friedman and colleagues in the United States (e.g., Friedman & Kahn, Jr., 2002), it has since been expanded into a general framework for technological innovation (Friedman & Hendry, 2019). VSD typically employs the 'tripartite' method of conceptual, empirical, and technical investigations, to analyse the values at stake, the needs and desires of stakeholders, and the technical possibilities for achieving the established goals (see Winkler & Spiekermann (2018) for a review of the tripartite methodology in practice). Aligned with VSD and sharing the

overarching goal, but not necessarily adhering to the tripartite methodology, is the broader approach known as design for values (DfV). A first comprehensive overview of theoretical debates, methodologies, and domains of applications for DfV can be found in the Handbook of Ethics, Values, and Technological Design (van den Hoven et al., 2015).

A variety of methodological approaches have been proposed under the headings of VSD/DfV, with the goal of identifying, analysing, and ultimately operationalising values in the design process (for an overview of methodologies, cases, and critiques of VSD/DfV, see for example Friedman and Hendry (2019), van den Hoven et al. (2015)). Most important for the present inquiry are a few core theoretical axioms that unify the approaches, relating to the relationship between values and technology. First is the assumption that technologies – as well as the processes of technological innovation – are not value-neutral, but that moral values can be expressed or even embedded in technologies. As Winner (1980: 127) argued, 'The things we call 'technologies' are ways of building order in our world. Many technical devices and systems important in everyday life contain possibilities for many different ways of ordering human activity. Consciously or not, deliberately or inadvertently, societies choose structures for technologies that influence how people are going to work, communicate, travel, consume, and so forth over a very long time.' Second, value-sensitive approaches are explicitly forward-looking, in that they aim to proactively incorporate values into artefacts, systems, or services – presumably improving the moral acceptability of innovations by steering them towards desirable end goals. Thus, both VSD and DfV posit that moral values can – and should – be identified and incorporated early in the design process as 'supra-functional' design requirements (van den Hoven, 2017). Regardless of the specificities of the chosen methodology, value-sensitive theories therefore assume the possibility of doing 'ethics by design.'

This is undoubtedly an attractive proposition. To align technological innovation with moral values – or more profoundly, to have innovation processes that can anticipate and foster social and environmental goods – is a noble goal. But like any theory, it is not without criticism. As conceptual debates and case studies have developed, critiques have been raised regarding metaphysical foundations, epistemic limitations, and applicability. One perennial critique deserves highlighting, which is significant for the application of VSD and DfV to urban technologies: the problem of how 'values' are conceptualised and defined (e.g., Manders-Huits, 2011; Davis & Nathan, 2015). The conceptual stage of the VSD tripartite method serves to provide theoretical grounding for empirical and technical investigations, and is thus often generative in that it frames the values at stake in any project (Friedman & Hendry, 2019). Likewise, different design methods within DfV – for example the 'values hierarchy' that follows a process of translating abstract moral values into prescriptive norms, and then specific design requirements (van de Poel, 2013) – relies on an initial conceptu-

alisation of moral value(s). Yet despite the need to conceptualise values, it has been argued that much of the literature avoids questions about the metaphysical foundations of moral value (and practically, which values matter in which circumstances, and why). This can, in turn, lead to downstream issues regarding how supposedly value-sensitive designs are realised. It may compromise the efficacy of the intervention or design proposal, and more fundamentally the ability to anticipate use contexts – what has been described as the 'positivist problem' (Albrechtslund, 2008) or the 'designer fallacy' (Ihde, 2008).

It has been suggested by Manders-Huits (2011) and Jacobs and Huldtgren (2018) that a way to overcome this challenge is by explicitly adopting a specific meta-ethical commitment – for example the capability approach – as metaphysical grounding. While I agree that a robust account and justification of the meaning of 'values' is necessary, I take a different approach to resolving (or at least making progress on) this metaphysical critique. Seeking to establish a chosen meta-ethical theory as the necessary foundation for VSD and DfV may ultimately just 'pass the buck,' instead requiring a justification of why that theory is the appropriate foundation, leading down a rabbit hole of meta-ethical debates. An alternative way forward is to appreciate that technology and society co-evolve, which will continually change the definition or prioritisation of values (van de Poel, 2018; 2020). Thus, we can adopt an interactional perspective, appreciating that 'human beings acting as individuals, organisations, or societies shape the tools and technologies they design and implement; in turn, those tools and technologies shape human experience and society' (Friedman & Hendry, 2019: 29). Such a perspective is pragmatic, in that it eschews a final articulation of moral value in place of a dynamic, context-sensitive perspective. As will be discussed below, such a perspective is particularly useful when locating and analysing the value-ladenness of urban technologies.

3. TECHNOLOGY AND THE CITY

The emergence of 'smart city' ideologies and applications, driven by innovations enabled by real-time data collection and monitoring, automation, and AI, have brought renewed attention to the city as a site of technological innovation. This has led to interdisciplinary discourse on the ethics of the smart city, as well as the political ideologies and socioeconomic agendas underlying smart urbanism (e.g., Cardullo & Kitchin, 2019; Kitchin, 2016; Johnson, 2020; Sadowski, 2020; Sadowski & Bendor, 2018; Sadowski & Pasquale, 2015; Shelton et al., 2015; van der Sloot & Lanzing, 2021). This body of literature is largely critical, analysing the dangers related to values such as privacy, surveillance, and inclusion; questioning the dominant (neoliberal) ideolo-

gies; and, drawing attention to power dynamics created by the increasing presence of corporate actors and interests in the public sphere.

These critiques are undoubtedly important. Yet largely absent from this discourse is an ontological consideration of technology in/of the city, and the underlying framing of city-technology relations in smart city debates. It has been noted that proponents of smart urbanism frame cities as a machine to be optimised (Battencourt, 2013), leading to what Sennett (2019) has described as the prescriptive smart city – a form of top-down planning that seeks to impose rationalistic control with the goal of efficiency (and as a result reducing transparency and public participation in place of technocratic control). This, in turn, leads to a focus on short-term strategic management (Batty, 2013), and an over-emphasis on values such as efficiency. Smart cities are thus focused on optimising routines and short-term patterns and behaviours, rather than longer-term goals in urban planning and city building (Batty, 2013; 2018b).

An alternative framing is to adopt an evolutionary perspective of cities that has been advocated in different lines of planning theory, positioning cities as social and infrastructural networks co-located in space and time; as complex structures that are emergent and dynamic rather than static (Batty, 2018b; Battencourt, 2013). Key to this framing is that cities are conceived as open-ended and will necessarily evolve dependant on changing cultural and socioeconomic trajectories, as well as design and policy choices – akin to the interactional theory of technology and society mentioned above. Further, this framing invites a much larger temporal perspective than those driving smart urbanism and associated innovations (Batty, 2018a). Along this line of thinking, Kitchin (2016: 11) argues that smart urbanism urgently requires a re-framing the city: 'Rather than being cast as bounded, knowable and manageable systems that can be steered and controlled in mechanical, linear ways, cities need to be framed as fluid, open, complex, multi-level, contingent and relational systems that are full of culture, politics, competing interests and wicked problems, and often unfold in unpredictable ways.'

To see cities as open, complex, and dynamic systems likewise leads to a different framing of the role of technologies within cities. First is an attention to the mereology of cities and their technological components, or the relation between parts and whole. Cities are comprised of a multitude of artefacts and systems, creating a complex interaction of micro and macro parts (Epting, 2016a). This inherent characteristic of cities, as complex interactions between various actors and systems, makes it difficult to disentangle the holistic notion of a city from its many interwoven (social and technological) components. A second important characteristic is the temporality of cities. They persist through time, gradually changing their physical structures, population size (as well as distribution and demographics), social and economic systems, etc. Varzi (2019) proposes that we should think of cities as processes – not

just metaphorically, but literally. Cities are four-dimensional, unfolding and extending in time and space. Just as a river is defined by its constant flow, a city is in a gradual but constant flux. Parts evolve, change, emerge, or dissipate. Thus, the interaction of city components is both spatial and temporal: cities are built over, and rely upon, a complex entanglement of infrastructures, which in turn embody past ideologies, values, and politics. This is figurative but also literal, in that the underground of cities is a rhizomatic interplay of transit lines, service tunnels, sewers, pipes, cables, and more. A close look at these systems also blurs the distinct boundary of cities, as these underground structures extend outward to water reservoirs, power stations, highways, etc. (Vogel, 2018).

What such a perspective reveals is that cities have many facets, and each can be taken as a point of departure for definitions, categorisations, and analysis. Exactly what constitutes a city is a complex question that has been considered from many angles by various philosophers and theorists, illuminating different aspects of urbanism and city life (see Meagher, 2008). Indeed, the meaning of 'city' varies by discipline and topic of interest, and it is debatable if such a unified theory is possible or necessary (Noll, Biehl, & Meagher, 2020). They have a physical footprint comprised of buildings, roadways, infrastructures, and public spaces. This responds to – and often contends with – their environmental conditions (e.g., weather, topography, and local ecology). Layered overtop is the sociality of cities: the people, institutions, and politics that constitute city life. A central question is thus the relation between the physical and the social; between the dominance and influence of the built environment or the socio-political factors of city life; between 'building' and 'dwelling' (Sennett, 2019). In critiques of the smart city and smart urbanism, the focus is largely on contemporary power structures. Yet this risks overlooking the formative and interactive role of technology in urban life worlds, and the role of technological innovation in the open and evolving process of cities. Cities are, and always have been, technological: 'technologies of all scales – artefacts, buildings, systems, and infrastructures – are inexorably intertwined with the very concept of 'city'' (Nagenborg et al., 2021: 2). Thus, smart innovations are not an imposition of technological capital on an otherwise non-technological system known as the city; rather, cities are fundamentally technological. While smart urbanism and other modern initiatives seemingly impose new tools and innovations, they can also be understood as one iteration in a larger process of technological innovations shaping cities and city life (see Shelton et al., 2015).

Conceptualising cities as open and evolving, as well as fundamentally technological, re-orients the epistemic and ontological grounding through which we analyse urban technologies. First, it allows us to move away from a dualistic view of the physical and social (Varzi, 2019), instead seeing these as inherently entwined within an unfolding process. Equally important, it allows us to step back, and think about how

we think about cities – not as finite and stable entities, but as evolving, composite processes comprised of distinct but interrelated components. Taken together, we can appreciate the interactions and processes that facilitate the ongoing construction and deconstruction of cities, and re-frame our thinking away from a static notion of 'city,' instead towards ideas of cityness (Sassen, 2010; Nagenborg, 2020).

What, then, constitutes an urban technology? Or rather, what is the role of technologies in the complex process of designing, building, maintaining, and destroying cities? Here, I follow Nagenborg (2020) in approaching urban technologies as a hermeneutical, rather than ontological, category. Nagenborg explains that the label of urban '… does not refer to a specific type of technology that shares certain properties. The concept is meant to offer a specific perspective on a technology that considers it as urban technology by a) claiming an interdependence between the technology and the city and b) focusing on the interplay between the two' (Nagenborg, 2020: 347). It is not an exclusive category, but one of context. As Nagenborg explains, the elevator can be scrutinised as an urban technology, in the sense that it enables the inhabitation of skyscrapers, and thus the verticality and density of city centres. And as mentioned in the introduction, electric lighting can likewise be analysed as an urban technology, in that it fundamentally shapes the visual and experiential landscape of urban nights. Considered from this perspective, cities are inexorably intertwined with technology. Put otherwise: if a city is a process, then urban technologies are fundamental movers of that process. Developments to urban technologies, be they mundane or profound, gradual or disruptive, thus serve as stimuli to the process of cityness. This definition admittedly leaves open the critique that all and any technology can therefore be considered an 'urban' technology. However, I do not see this as a weakness, but rather a consequence of the ambiguous borders and boundaries of cities. Positioning an artefact as an urban technology simply requires that we take a context-sensitive perspective and framing, and ask to what degree this technology has affected urban form, urban design, city maintenance, or the socio-political aspects of city life. Importantly, this categorisation allows us to probe the formative role of different urban technologies, the origins and meanings of associated values, and ultimately how this can inform urban technological innovation.

4. SURFACING VALUES IN/OF URBAN TECHNOLOGIES

With an ontological framing of cities as open and evolving, as well as a hermeneutical categorisation of urban technologies, we can return to the challenge of asking what framework could strengthen the application of VSD and DfV methodologies in this domain. Combining the above insights, here I propose six principles to assist in

identifying, defining, and ultimately operationalising values in urban technological innovation. Important to note at the outset is that these principles are envisioned as a set of heuristics, in the sense of offering general guidelines for analysing and interpreting 'values' via their manifestation within urban technologies, rather than a rigid framework. This provides a foundation for surfacing the 'mediums' of our cities (to use Isenstadt's term), at least on a descriptive level. With this, we can become better positioned to move towards making normative claims about the desirability of different policy or design interventions.

To concretise the six principles, Section 4.2-4.6 will continually return to a running case study: night-time lighting. As briefly presented in the introduction, electric lighting can be understood as a paradigmatic urban technology. Further, it carries a rich (and well-documented) social and technical history; it has an enduring and complex interrelation with various values (e.g., safety, sustainability, modernity); and, it is arguably in a phase of innovation and evolution, driven by the introduction of LED outdoor lighting and 'smart' lighting initiatives. Further, it is a technology presently undergoing a moral and political re-evaluation, due to rising concerns over the costs and impacts of light pollution (Stone, 2017; Challéat et al. 2015). Thus, it allows for brief reflections on how the heuristic principles can be applied, in the service of surfacing values in, and of, urban night-time lighting.

However, two caveats are necessary. First, these principles were formulated via a reflexive analysis into the above methodological critiques of VSD/DfV, the categorisation of cities and urban technologies, and ongoing work on a specific urban technology (namely, night-time lighting – see Stone 2019). As such, they represent a generalised framework drawn from a specific urban technology. Because of this, and because of the heuristic nature of the principles, they are not put forward here as final or complete. Rather, they offer a first step towards identifying values in urban technologies, which can be iterated, revised, or expanded upon – either as a universalised framework, or in relation to other urban technologies (see Section 4.1). Second and relatedly, these principles are explicitly focused on a conceptual analysis into the relationship between moral values and urban technologies. These are therefore not meant to offer a complete analysis of urban technologies, nor a comprehensive framework for applying VSD, DfV, or responsible urban innovation. Just as the conceptual stage of VSD's tripartite methodology is one step in an iterative process, the framework articulated here must necessarily be introduced into the specific context of each inquiry. Cities are not homogeneous, but have large variations in size, scale, geography and climate, culture, politics, governance, economics and industry, etc. Further, there can be large social and economic discrepancies within a particular city. Thus, any analysis should be, to a degree, dependent on the context of the specific city (or region, or neighbourhood). It then becomes a question of balancing the requirements or idiosyncrasies of a particular context and situation

with broader frameworks and values (see Epting, 2016b: 442). Likewise, addressing the political and socioeconomic concerns raised by the critiques of smart urbanism, as well as an engagement with (in)direct stakeholders, are necessary steps in realising responsible urban innovations. This analysis does not de-prioritise these issues; rather, it compliments these perspectives and approaches by working to identify and analyse values at stake, towards developing a comprehensive approach to responsible urban innovation. Thus, the below principles offer a means to theorise about the relationship between values, urban technologies, and cities.

4.1. TECHNOLOGY MATTERS

Following the 'empirical turn' in ethics of technology (Kroes & Meijers, 2000), VSD and DfV have moved away from analyses of 'Technology,' instead focusing on the specificities of a particular artefact, system, or otherwise. The analysis of urban technologies should be no different, and likewise move beyond analyses based on abstracted categories such as 'smart.' This is exemplified by the running case study of night-time lighting in the following sections. Urban lighting is a topic unto itself, with rich and interdisciplinary internal debates regarding the multifarious ramifications of technical, policy, and design innovations. The vignettes in Sections 4.2-4.6 thus explicitly frame the case study, not as an investigation into the ethics of smart lighting, but rather as in inquiry into the ethics of urban lighting. Critically, this frames smart streetlights and associated innovations as the latest iteration in a temporally and spatially extended sociotechnical system, rather than as novel impositions onto the city. As will be shown, this can reveal a much more historically and contextually contoured view of the relationship between artificial illumination, urban nightscapes, and moral values.

4.2. BOUNDARY CONDITIONS AND EXTERNALITIES

Accepting the conceptualisation of cities and urban technologies above opens up important foundational questions of scope and scale: to what degree we can analyse (and eventually operationalise) values related to any one urban technology without accounting for external influences. Urban technologies are generally not isolated artefacts, or even an isolated system, but a conglomerate of parts, systems, and infrastructures operating interdependently with (or within) other urban systems. These systems are deeply intertwined, just as individual components intersect. Thus, innovations to one urban technology may affect seemingly disparate social, political, or environmental issues. This means that value-sensitive analyses should examine the complex interactions within this network of urban technologies, and the inter-value dynamics at play therein. By expanding the boundaries of inquiry, we can arrive at

BOUNDARY CONDITIONS: NIGHT-TIME LIGHTING

The various studies of the history of urban nights consider night-time illumination in its totality, as an encompassing infrastructure that shapes perceptions, behaviours, social practices, and politics (e.g., Nye, 1990; Schivelbusch, 1988; Schlör, 1998). 'Urban night-time lighting' is thus approached as a holistic concept (at the city, regional, or even global level). Yet even as an encompassing sociotechnical system, the boundaries between night-time lighting and other urban technologies are fluid. Assuming a distinct boundary and discrete delineation between artificial lighting and, for example, transportation infrastructure, risks overlooking intertwined ethical issues. Elsewhere, we have argued that the introduction of autonomous vehicles could be used to reduce light pollution, via an anticipatory technology development strategy aimed at goals such as 'dark highways' (Stone et al., 2020). In doing so, we connect seemingly disparate ethical and technical discussions, bringing autonomous vehicles into debates about light pollution, as well as inserting values associated with urban lighting as prima facie considerations for the development of high-automation vehicles and surrounding infrastructure.

a better understanding of the values at stake, as well as how to eventually evaluate the individual components – not as isolated artefacts, but as both shaping and reacting to the process of cityness.

4.3. HISTORY MATTERS

In addition to the above spatial considerations, urban technologies have an elongated temporal resonance – decisions made today can last for decades or longer, affecting future generations as well as framing future design and policy choices (Epting, 2016b). Further, urban technological innovations are often not entirely 'new' but respond to a complex history of moral and political decisions, reactions to the consequences of past innovations, and the impacts of evolving behaviours and use patterns. Urban development is a gradual process – when ethical issues emerge, the values, politics, and technologies that precipitated the current situation are crucial to know and understand, before looking forward. This necessitates that value-focused inquiries also look backwards at the layered, iterative history of an urban technology, to appreciate the origins and evolution of identified values (see Vogel, 2018). Arguments have been made for the importance of historically and contextually situated inquiry within fields such as environmental ethics and aesthetics (e.g., Holland, 2011; Maskit, 2014; O'Neill et al., 2008), and more recently within smart urbanism discourse (e.g., Odendaal, 2020; Sadowski & Maalsen, 2020; Shelton et al., 2015). A

similar case is made here for the ethics of urban technologies. Knowing the history of an urban technology – both its technical development, as well as the associated cultural forces that shaped its use – is crucial for appreciating the present context.

HISTORY MATTERS: NIGHT-TIME LIGHTING

The modern development of public night-time lighting can be traced back across multiple technological leaps (i.e., oil lamps, gaslight, and electric light), which occurred over several centuries. While each new technology created significant ruptures in the design and use of night-time lighting, each was also layered over the existing landscape of values and use patterns. As an example, we can return to the 'smart city' trends currently driving a new generation of streetlights, with lampposts being fitted with sensors, cameras, and a host of other novel technologies aimed at monitoring and data collection. While these innovations may offer improvements in efficiency and data-collection, they raise concerns about privacy, surveillance, and power dynamics. More fundamentally, such smart systems appear to extend the technical functions and ontological boundaries of streetlights. No longer simply providing illumination, they actively monitor their environment and those who inhabit it, creating a vast network of nodes encompassing urban spaces. Combined, the novel functions and capabilities of smart streetlights seemingly create a new terrain of moral concerns.

However, the history of night-time lighting offers a different perspective: these supposedly novel issues represent a continuity of the values fundamental to the modern foundations of public lighting. Debates over social order at night – and the resultant tension between safety, privacy, and surveillance – have been a recurring theme for centuries (Edensor, 2017; Schivelbusch, 1988; Schlör, 1998). Streetlights have long been utilised as a form of policing and perceived as a symbol of authority, creating ongoing conflicts between control and liberation in urban nightscapes. At least since the French Revolution, streetlights have embodied a tenuous relationship between safety at night, public order, and citizen's rights. In reference to the practice of 'lantern smashing' during the French revolution as a means of revolt, Edensor (2017: 172) notes: 'Ever since, there has been continuous conflict between seekers of dark spaces and those who authoritatively aim to extend surveillance across the nocturnal city.' While perhaps offering significant improvements in accuracy and monitoring, smart streetlights embody a continuity of values – and value tensions – that can be traced back to the origins of public lighting in the 17th-18th centuries. Contemporary innovations represent new means of realising these long-held goals, just as resistance to them offers fresh versions of protest and critique. Placed in this historical context, we can situate smart lighting innovations as layered over, and responding to, a much longer struggle. Omitting this history risks uncritically repeating past debates (and mistakes), ultimately leading to a short-sited understanding of the value tensions inherent to lighting and public order in urban nightscapes.

4.4. SYMBOLISM MATTERS

Closely tied to situating urban technologies within their broader history, it is crucial to appreciate their symbolic dimensions. Technologies that shape, and are shaped by, cities do much more than fulfil their technical requirements. Rather,

SYMBOLISM MATTERS: NIGHT-TIME LIGHTING

Artificial light at night continues to function as far more than a practical source of illumination. It represents and embodies ideals such as safety and progress, to the degree that it is difficult to disentangle and disassociate the actual functions of lighting from its perceived role. The relationship between safety and lighting is complex, and the measurable benefits of increased illumination are contentious at best (e.g., Gaston et al., 2015; Henderson 2010; Marchant 2004). However, it is undeniable that people feel safer in brightly lit spaces (e.g., Boomsma & Steg, 2012; Haans & de Kort, 2012), even if bright spotlights and strong contrast can actually reduce visibility of the surrounding area. Taking note of the principle History Matters above, we can also appreciate that throughout the development of modern public lighting, this assumed link between lighting and safety has endured (e.g., Schivelbusch, 1988). Further, this is built on much deeper associations between illumination and darkness. 'However efficiently artificial light annihilates the difference between night and day, it never wholly eliminates the primitive suspicion that night people are up to no good' (Alvarez, 1996: xii-xiv). The relationship between illumination and safety is often assumed in policy and design choices, even if this does not align with empirical findings.

The symbolism of artificial light also extends to more abstract notions. In Electric Light, Isenstadt (2018) explains in great detail how the advent and proliferation of electric illumination was a driver of modernity. Similarly, in Electrifying America historian David E. Nye (1990: 35) explains how this technology was utilised to symbolise progress at world's fairs: 'Organisers looked for elements of display at once refined, abstract, expensive, and as modern as possible, and electricity had all of these qualities… Electricity became more than the theme for a major exhibit building; it provided a visible correlative for the ideology of progress.'

A critical analysis of the symbolic meaning of night-time lighting can reveal that something like 'designing for safety at night' requires a nuanced understanding of how the very notion of 'safety at night' is linked to the perceived meaning of lighting, not just the functional qualities of streetlights. It can likewise reveal, for example, that efforts to reduce light pollution cannot rely on technical fixes alone, but must address the inherited ties between artificial illumination, modernity, and progress.

there is an entwinement of symbolic meanings and functionality, which itself often relies on inherited symbolism. This symbolism goes beyond subjective impressions or placebo effects, but is rather an essential and foundational feature driving the development and use of urban technologies. Through acknowledging and analysing their historical and cultural importance, the (perceived) meaning of urban technologies can surface. Appreciating these deeply entrenched symbolic dimensions is key to analysing the morality of urban technologies; and importantly, it allows for taken-for-granted values to surface.

VALUABLENESS OVER VALUES: NIGHT-TIME LIGHTING

In recent years a novel moral issue has surfaced regarding night-time lighting: light pollution. Put simply, this is an umbrella term used to identify and categorise the adverse impacts of excess or poorly designed artificial light at night. This is often sub-categorised into economic costs, energy waste, ecological damages, health effects, and the disappearance of the starry night sky. A great deal of research is underway to quantify these negative impacts (e.g., Davies & Smyth, 2018; Falchi et al., 2016; Gaston et al., 2015), and a recent body of literature has emerged examining the ethics and politics of light pollution (see for example, Stone, 2017; Bogard, 2013; Meier et al., 2015). All of these studies share a common problem frame: that some aspects or uses of artificial illumination are bad, and we should focus on reducing or mitigating these negative effects.

While useful efforts, an alternative approach is to adopt a refined DfV perspective, highlighting those valuable features of contemporary nightscapes that require preserving and fostering. For this, I have proposed elsewhere that darkness should be understood as valuable for contemporary urban nightscapes, and as something through which claims to value both emerge and are fostered or hindered (Stone, 2018; 2019; 2021). Instead of diving into meta-ethical debates regarding environmental values, we can position darkness as something by which, or through which, values can be fostered or promoted. This does not require a defence of darkness as a final or intrinsic value – it simply acknowledges that in our world of abundant artificial illumination, re-introducing darkness into our cities and lived experiences would be valuable. When put into dialogue with the context, history, and symbolism of night-time lighting, a focus on darkness can allow for creative – and importantly value-sensitive – design innovations to emerge.

4.5. VALUABLENESS OVER VALUES

Striving for practical solutions to complex urban challenges requires a shift in focus from values to questions of what is valuable – a balance between abstract articulations of moral values and 'what is important to people in their lives' (Friedman & Hendry, 2019: 24). By focusing on what is meaningful about a specific urban technology, we can re-position discourse away from meta-ethical debates about the nature or definition of value, and instead draw out practical, workable ideas. This follows from the interactional theory of technologies and values supported in Section 2, as well as the categorisation of urban technologies articulated in Section 3. Further, it closely aligns with the practical end goals of VSD and DfV. Importantly, this leads to a prioritisation of things we find valuable for a specific time and place, rather than a focus on philosophical values themselves. However, I am not advocating for the abandonment of the word 'values' in discourse, or of value-sensitive approaches as a theoretical and methodological starting point. Rather, for re-orienting inquiries to focus on those things we find valuable, rather than striving to arrive at a final, defendable definition of certain values (or the philosophical nature of value).

4.6. ABANDON COMPLETENESS

A final, summative principle is the abandonment of (conceptual) completeness as a goal. The temporal and spatial longevity of cities and urban technologies means that relevant values – and what urban dwellers find valuable – will necessarily evolve. Some may endure, but many will evolve, others will fade, and new values may emerge. This requires an abandonment of the goal of achieving a final, definite understanding of the values under investigation. Instead, it acknowledges that the topic under study is emergent and open to change (e.g., van de Poel, 2018). Thus, we must appreciate that analyses of urban technologies must themselves be iterative and conceived as an open-ended process, like cities themselves. To put it more poetically: Winston Churchill's oft-cited and paraphrased quote 'we shape our buildings, thereafter they shape us' is incomplete. Rather, first we shape our buildings, thereafter they shape us, then we shape our buildings again, then they shape us again, and so on.

Appreciating the dynamic relationship between cities and urban technologies provides an overarching framing, but also a starting point for value-focused analyses. A first step is exploring the emergence and foundations of the value(s) at stake, before moving to a systematic application. This requires combining open and explorative inquiries into the topic at hand with testing findings via their practical applicability. The back-and-forth deliberative and iterative exercise between conceptual debates and practical interventions allows for the topic of concern to take shape, and ideally

ABANDON COMPLETENESS: NIGHT-TIME LIGHTING

In the early days of electric lighting, an argument to 'design for darkness' as a means to reduce 'light pollution' would have been – at best – a fringe concern. And, it will hopefully be different 50 years from now. Any success brought about by re-introducing darkness into cities, as well as light pollution mitigation, will change the relative meaning, importance, and priority of values for the future of urban night-time lighting. This is not a problem for the focus on darkness discussed in Section 4.5, but rather an approach that abandons any desire for a definite or complete framework. Light pollution, and the re-introduction of darkness in urban settings, are not issues that can be 'solved' with complete finality. Darkness and illumination are competing interests, but also complimentary. There will – and should be – a continuous striving towards an acceptable balance, which is itself a moving target.

for a useful framing of the problem at hand. It will not be perfect, but perfection is an unrealistic goal – consider the VSD motto of 'progress, not perfection' (Friedman & Hendry, 2019). In sum, this leads towards a pragmatic approach to the ethics of urban technologies, for which 'The aim… is not perfect rightness, then, since there is no absolute standard for reference, but rather creative mediation of conflicting claims to value, aimed at making life on the planet relatively better than it is' (Parker, 1996: 27).

5. CONCLUSION: TOWARDS RESPONSIBLE URBAN INNOVATION

This paper develops an analytic framework, in the form of six heuristic principles, which can be utilised to surface values in urban technologies. The principles build upon an ontological conception of cities as open, evolving and dynamic systems, and a categorisation of 'urban technologies' as those technologies that influence and co-shape cities and city life. Taken together, the framework sketched in this paper offers a means to apply VSD and DfV methodologies to the domain of urban technologies, and thus cities. Principles 1-4 (technological specificity, boundary conditions, historical context, and symbolic meaning) articulate criteria and perspectives to be utilised as a method of inquiry. They ask researchers to carefully examine the urban technology in question, towards arriving at a nuanced understanding of the origins, meaning, and interpretation of specific values. Principles 5-6 (valuableness over values, abandoning completeness) are overarching considerations, articulating an

orientation that acknowledges the complexity of cities, appreciates technology-value interactions, and cautions for some epistemic humility. As such, they are meant to highlight the limitations of our foresight, and offer a modest framing of the ultimate goals of value-based inquiries into urban technologies. Given as a running example, the brief analyses of urban night-time lighting reveal a complex value-landscape that value-sensitive approaches must confront to make useful contributions to lighting policy and design. Apparently straightforward notions such as 'safety at night' are shown to be nuanced and layered concepts, which in turn rely on past decisions and historical associations. It further shows that underlying values, such as modernity and public order, continue to influence the uses and perceptions of cities at night. And, it reveals how innovations outside the traditional boundaries of night-time lighting, such as autonomous vehicles, may influence lighting-related issues.

As argued in relation to both responsible innovation generally (e.g., Boenink & Kudina, 2020) and VSD/DfV specifically (e.g., Manders-Huits, 2011; van de Poel, 2018), continued work is needed to identify and conceptualise values and their relation to technologies (and technological innovation). Responsible innovation will benefit from continued work on processes and frameworks for value identification, and responsible urban innovation is no different. In developing an account of values in urban technologies, and a set of principles aimed at their identification, this paper offers a refined approach to designing for values in – and for – the city. Further, as the principles are aimed at elucidating substantive values in urban technologies, they can complement the political critiques of smart urbanism, as well as the procedural and participatory approaches to urban innovation found in urban theory (e.g., Williams, 2020).

The six principles offer a starting point for the analysis of urban technologies, towards realising value-sensitive urban technological innovation. Thus, while contributing to the development of VSD and DfV as universalised approaches to technology design, they should also be seen as a contribution to the critical and creative re-imagining of our urban futures. At the core of this analysis is a call to think about how we think about urban technologies. Responsible urban innovation can be utilised as a tool to assist in the process of city-building – in envisioning and enacting the types of cities we want. But it should be done with the acknowledgment that no innovation will be perfect or complete. However, they will ideally move our ever-evolving cities in directions aligned with the values we strive to foster and preserve.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

TEACHING SPATIAL JUSTICE: FOUR EXERCISES ON COMMUNICATIVE RATIONALITY & JUSTICE

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ABSTRACT

This chapter investigates why a focus on justice should be included in planning and design education. The central argument, based on the ideas of moral philosopher Alasdair McIntyre, is that justice is a 'internal and necessary good' for the successful practise of spatial planning, without which it is meaningless. It contends that spatial planning can be publicly justified only if it produces (perceived) just outcomes using (perceived) just procedures. It challenges the notion that justice is solely a subjective feeling, arguing that various justice claims must be resolved through public communicative exercises, of which spatial planning is but one manifestation. Although competing justice claims are frequently legitimate in and of themselves, they must be contrasted and evaluated against each other in context in order for justice claims to be appraised and some sort of agreed justice to be reached, albeit in imperfect ways, to ensure policy legitimacy, sustainability, and adherence. This chapter suggests four exercises to address communicative rationality and competing justice claims in the classroom, inviting students to argue their way through those claims from a variety of different perspectives.

SPATIAL JUSTICE, COMMUNICATIVE RATIONALITY, PUBLIC REASONING

1. PROLOGUE

Figure 1: A remote area on the border of Algeria and Mauritania, in the Western part of the Sahara desert. Map Google Earth© 2019, CNES/ Airbus, Landsat/Copernicus. Fair use. The use of this image complies with Google's terms of Service and rules of attribution.

Imagine. Imagine I own a plot of land in the heart of the Sahara Desert, distant from any towns, villages or oases, far from any caravan routes, and far from roads and airports. It is a neat piece of land, and it belongs to me alone. Due to the absence of rules and regulations, I am allowed to do whatever I choose in that plot and to build whatever my heart desires. My freedom is total (provide that I have the means to exercise that freedom). Surely, I will find a way to make some money off my investment, maybe by building a new city (for which I would need more land and maybe some generous bank loans). But would come live in my city then? Who would invest? Truth be told, the benefits I can derive from my small venture are rather limited at the moment. I have complete freedom, but what good does that serve?

Now imagine my plot has been magically teleported to London, to a neighbourhood called Camden. Now suddenly my plot is surrounded by both public and private 'goods.' Private goods are easy to envision. The buildings in the picture are, for the most part, private property, and so is the land. But there are also plenty of 'public goods.' In the economists' parlance, public goods are 'non-excludable' and 'non-rivalrous', that is, no one can be excluded from consuming them, and once they are consumed, their availability does not decrease to other consumers in that community. Public goods, such as parks, paved streets, safe sidewalks, sewerage systems, public lighting, and even air quality, are generated by public activity and are typically paid for with public funds raised through taxes. However, there are also intangible public goods that are harder to 'see' in the illustration, such as public safety, good access and mobility, history, attractiveness,

Figure 2: Camden Town, a distric in Northwest London. Photo by Google Earth© 2022, Bluesky, CNES/ Airbus, Getmapping plc, Infoterra Ltd. & Bluesky, Maxar Technologies, the Geo Information group, Map data ©2022 . Fair use. The use of this image complies with Google's terms of Service and rules of attribution.

and urban vibrancy. Residents of Camden can live full lives and have access to both public and private goods in this wonderfully active neighbourhood. Public goods do not come for free, but are the result of public coordination, regulation, and investment. Much has been invested to create the public goods that make Camden one of the most exciting neighbourhoods of London.

Suddenly, my freedoms are much more limited. Even if I had unlimited funds, I wouldn't be able to do whatever I fancy with my plot of land: there are restrictions on what I may build there, building codes I must follow, approvals I must seek. My freedom to build must not conflict with the already-existing public goods and must not interfere with the freedoms of all the other landowners around me and in the city at large. I am limited. But on the other hand, the quality (and consequently also the value) of the built environment is enormous! My plot is worth hundreds of thousands, maybe even millions of pounds. While living in cities somehow limits my freedoms, I derive enormous advantages from urban life: proximity, density, opportunity, history, identity, shared purposed, and much more. Some would say I am *freer* to pursue my dreams and aspirations in the city, rather than less free.

Evidently, there isn't yet a method for moving real estate from one place to another. There's a good reason why they are called '*biens immeubles*' ('immobile goods') in French and most Latin-based languages. Although of course I can move buildings around, moving land is trickier. Well, I suppose I could always build artificial islands and 'create' land - for which I would need quite a lot of investment.

This story illustrates some basic principles of urban development. It also explains why cities are said to be 'money-making machines,' as the benefits I listed (density, prox-

Figure 3: Street scene in Camden. Camden is an extrenely vibrant and friendly neighbourhood, known for its market by the Regent's Canal near Camden Lock. The area is popular for its alternative and punk scenes. Photo by Hert Niks on Unsplash. Unsplash licence.

imity, and intensity) tend to raise the price of land and, as a result, the rents I can collect from that land. As early as the 1930s, German geographer Walter Christaller put forward 'central place theory', as a means of examining the spatial benefits that led to the development and expansion of human settlements (Christaller & Baskin, 1966). As the decaying 'inner-city' neighbourhoods of some American cities remind us, centrality does not necessarily translate into higher rents (there is much more to say about the reasons for inner-city decay in American cities, many of them connected to structural racism, 'white flight,' suburbanisation, and lack of public investment, but this is a subject for a whole new chapter).

All in all, cities do not exist 'to make money'. Cities should guarantee equal rights and opportunities for all inhabitants, as they are the product of their collective work. I believe most people would agree that cities serve first and foremost a social function, and so does urban land, and the quality of the built environment must be assured via continuous investment, coordination, and regulation.

Public goods can be created via private investment (for example, many company towns in Europe and North America were excellent to live in!). However, due to their history, size, and complexity, cities are a combination of private and public endeavours, and GOOD cities are typically the result of much (public) coordination, investment, and regulation. But how should public goods (and public annoyances) in cities be created and distributed, and by whom? And what are the criteria for 'good distribution'? This chapter seeks to answer those questions at a conceptual level, introducing Justice as an internal good for the realisation of good spatial planning, and suggesting four exercises that illustrate and clarify that position in the classroom.

2. INTRODUCTION

Let's first examine the significance of justice to our story.

Moral and political philosopher Alasdair McIntyre argues that a practice is defined by the goods internal and necessary for the successful realisation of that practice (McIntyre, 2007). In the case of spatial planning, we must ask ourselves: what are the goods internal and necessary to its successful practice? When do we know we have achieved good spatial planning?

As an important tool used in modern societies to decide on the allocation of the burdens and benefits of our association in cities and communities, spatial planning must address competing claims on the allocation of burdens and benefits of development, which again begs the question: how to decide? What are the frameworks and criteria we can use to make decisions about that fair allocation of resources? Justice seems to be a crucial element in deciding upon those competing claims. As American moral and political philosopher John Rawls proclaims in the very beginning of his book *A Theory of Justice*: 'Justice is the first virtue of social institutions, as truth is of systems of thought. A theory however elegant and economical must be rejected or revised if it is untrue; likewise laws and institutions, no matter how efficient and well-arranged, must be reformed or abolished if they are unjust' (Rawls, 2005: 3).

I wish to argue here that justice is a definitive 'internal good' that allows planning to achieve its standards of excellence, without which it is meaningless. In other words, justice is an essential component of planning, without which planning cannot be publicly justified or sustained. Only by pursuing a just distribution of burdens and benefits through just procedures could we ever claim we have achieved 'good' spatial planning. Of course, this also raises the question, 'just for whom'? Shall we adopt a Utilitarian perspective and seek the greatest benefit for the greatest number of people? Or maybe we should focus on Egalitarianism and seek equal distribution? Or maybe we should protect the right to property and entrepreneurship, and protect those who work harder than others, in a sort of meritocratic society? But what is merit? Is a billionaire, by his own virtues, more deserving than a street cleaner? Can we say the billionaire works harder? Or maybe the billionaire has built his fortune on the backs of people who actually work hard? Should the children of a street cleaner be given the same opportunities as the children of a billionaire, so that we can assess their true personal worth on an equal footing?

As you can see, there are no straight answers, but seeking justice seems to be evidently crucial to achieve a good society (and good cities). If this is true, then discussing justice and diverse justice claims should be an integral part of a spatial planning education, lest we fail to address one of the very internal goods that define spatial planning's success. But can we 'teach justice'? And, if so, how?

3. CAN WE TEACH JUSTICE? JUSTICE AS PUBLIC REASONING

Teaching values for undergraduate planning students seems like an odd endeavour. And teaching about justice seems like the oddest endeavour of all, due to the intense subjectivity associated with the concept of justice.

In a poem titled 'The Deepest Sensuality', the great British poet and novelist D. H. Lawrence writes that 'The profoundest of all sensualities is the sense of truth and the next deepest sensual experience is the sense of justice' (Lawrence, 1994: 545). And indeed, we seem to experience feelings of justice and injustice at the very core of our beings. Injustice, even when perpetrated on others, can often cause pain that is experienced as almost physical, sometimes quite literally, as a string of studies in psychology and physiology of pain seems to demonstrate (Carriere et al., 2018; Miller et al., 2016; Sullivan et al., 2009).

We experience justice and injustice viscerally, but justice and injustice are far from being subjective experiences only. Justice is of course also political, and there are public conceptions and systematisations of justice.

As Rawls so masterfully explains in his book *A Theory of Justice* (Rawls, 2005, originally published in 1971), justice should be the outcome of the association with our fellow humans in society, from which we all derive numerous benefits but also suffer burdens. In short, Rawls' conception of justice implies that societies should be structured so that individual liberty is maximised, but with the caveat that the liberty of any one member of a society shall not infringe upon that of any other member. Our freedoms are limited by the freedoms of all those around us.

Rawls recognises that 'although society is a cooperative venture for mutual advantage, it is typically marked by a conflict as well as by an identity of interests' (Rawls, 2005, 4). People generally agree that living in society benefits us all, but Rawls argues that we are also inclined to seek a bigger share of the fruits of that association, in apparent compliance with rational choice theory, which postulates that individuals will pursue their own self-interest by making 'rational' choices that will increase their benefits and advantages. Assuming this is true (at least part of the time), Rawls argues that 'a set of principles is required for choosing among the various social arrangements which determine this division of advantages' (Rawls, 2005, 4). Together with the idea of maximisation of individual liberties, these ideas are cornerstones of liberal democracies, but they also contribute a good deal to neo-liberal thought in economics and have been heavily criticised, as we shall see later in this text. Nevertheless, the idea that we must reach agreements about how the burdens and the benefits of our life in society must be shared and distributed seems to make sense.

Rawls proposes a set of principles under which justice could be achieved. The first is called the 'liberty principle', which we have already discussed. The liberty principle states that 'each person participating in a practice, or affected by it, has an equal right to the most extensive liberty for all' (ACADEMY4SC, 2021). Again, an individual participating in a given society should have access to the maximum amount of freedom available, without infringing on others' right to the same freedoms. The second principle is 'fair equity of opportunity' and states that 'inequalities are arbitrary unless it is reasonable to expect that they will work out for everyone's advantage and provided the positions and offices to which they attach, or from which they may be gained, are open to all' (ACADEMY4SC, 2021). This statement tells us that, as a rule, inequalities are undesirable, but they may be allowed if inequality is conducive to everyone's advantage (think of the advantages gained by a group by having good leadership, for example, in which the leader has clearly some advantages over her or his followers), and when anyone, irrespective of their position in society, has a fair chance to be part of the structures and institutions that provide that advantage (using the same example, that would imply that anyone should have the ability to become a leader, irrespective of their initial position in society).

However, as many have pointed out, from Karl Marx to Edward Soja and beyond, individuals and societies must deal with structural inequalities, which means people are not on equal footing when deciding how resources should be shared, because power and resources have historically been unevenly distributed. According to Marxist theory, the 'modern bourgeois society' is established to protect the means of production and the bourgeois class from the interests of labour (Marx & Engels, 2014 [1848]: Chapter 1), and the owners of the means of production derive their advantages solely from their social position, regardless of their virtues or vices.

As stated by Sorensen, 'Inequality is generated by structural relations, and advantages and disadvantages are attached to positions in social structure. The personal characteristics of capitalists and workers do not matter much for the process that generates inequality' (Sorensen, 1996: 1335). Despite critiques to Marxist theory, especially to the labour theory of value, the idea that inequality is generated by structural relations embedded in an individual's or a group's position in society seems to stand.

To achieve the type of justice advocated by Rawls, we would need to return to a state in which all individuals had the same abilities and capabilities (and thus the same freedoms), so that an individual's position in society did not matter in determining the rules that govern that society. Rawls eschews this problem by proposing a thought experiment in which individuals are shrouded in a 'veil of ignorance' about their own advantages and disadvantages, and from this 'initial position,' they can decide the rules that govern society without regard for their own positions in it and the resulting advantages and disadvantages.

Despite Rawls' theoretical edifice's ingenuity, we saw how structural inequalities make these premises difficult to implement in actual existing societies. Even the most successful democracies must deal with historically constructed and socially and economically perpetuated inequality.

Essentially, Rawls proposes that societies should strive to create those conditions to the greatest extent possible, despite the fact that achieving perfect justice is nearly impossible. To a large extent, liberal democracies seek a pragmatic approximation of those ideas, with varying degrees of success, depending on the economic model they adopt and the architecture of their institutions. For many, Rawls' ideas impose impossible standards, as the perfect institutions they aspire to in order to deliver justice appear to be impossible to achieve in practise.

Amartya Sen, Rawls' former student and intellectual partner, criticises him for pursuing the 'perfect system' for a 'perfectly just society' through 'transcendental institutionalism,' the idea that perfect institutions will deliver perfect justice, despite the fact that the practical world is far from affording those conditions. Sen, therefore, seeks to shift the argument, and to think about how to make actually existing societies fairer tomorrow than they were yesterday. For Sen, it is all about 'enhancing justice and removing injustice' (Sen, 2009: Preface), rather than seeking the perfect institutional arrangements that will deliver perfect justice. In other words, Sen advocates not for a perfectly just society, but for an 'increase of justice' in our existing societies, by focusing on making our laws and institutions more just incrementally.

But Rawls and Sen have more in common than meets the eye. Different from those who believe justice is dispensed by a divine being who judges us by our actions, both Rawls and Sen believe justice is a human invention whose function is to help us live together in society. Paraphrasing Israeli historian Yuval Noah Harari, justice is an 'imagined order', just like organised religion, money, and the State (Harari, 2015). For Harari, imagined orders are narratives that tell people how to behave in society and allow them to cooperate, creating trust among those sharing that narrative. Justice helps us live with each other in society, and is certainly at the root of most, if not all, human social systems, including religion, order, morality, legality, and the State.

In this sense, justice is not something 'out there' to be discovered or unveiled but is essentially a social construction. In this sense, justice is not (just) a subjective gut feeling, but an idea, a concept that we can use to decide upon competing claims, by means of (collective and public) reasoning. Justice claims can be debated, voted on, codified, and institutionalised.

But as Rawls and Sen explicitly acknowledge, there are different conceptions of justice, and as many ways to enact it. As Sen explains, there are many comparative questions of justice that can be resolved relatively easily through sound reasoning. And there are old and rich traditions of philosophical thinking about justice: utilitarianism, egalitarianism, and libertarianism, to cite just a few of the main ones. There

are, he warns, several reasons of justice 'each of which survives critical scrutiny, but yields different conclusions' (Sen, 2009: Preface). Moreover, 'reasonable arguments in competing directions can emanate from people with diverse experiences and traditions, but they can also come from within a given society, or for that matter, even from the very same person' (Sen, 2009: Preface).

In other words, there are many ways to argue for competing conceptions of justice, and different arguments can be equally valid. So maybe we are back to the beginning of this chapter: if there are no ways to arrive at clear unequivocal evaluations of what is more or less just, it is therefore useless to teach justice.

Sen argues that even if we are unable to arrive at crystal clear evaluations about justice claims, comparative reasoned evaluations of what is more or less just are possible. As he points out, there are straightforward evaluations we can make via public reasoning (by comparing the merit of different claims, for example). The process of discussing justice claims is equally important and speaks to the need to enlighten the participants of the discussion about other participants' reasons and ideas and about their own reasons for competing claims of justice. Sen also points out that some reasons of justice might not survive the scrutiny of (collective public) reasoning (Sen, 2009: 45). In short, some reasons of justice can only stand when they are not confronted with other reasons of justice, hence the exercise of discussing (and teaching about) justice contributes to the formation of a more robust public conception of justice.

There is value in listening and speaking about different conceptions of justice in communicative exercises that accept the contributions of all members of a given community equally, in order to arrive not at hard results, but at agreed evaluations of what is more or less just to a certain community.

This speaks to communicative rationality and to the role of human communication in resolving competing claims about the world. As we shall see, communicative rationality has had a strong impact on planning practice.

4. COMMUNICATIVE RATIONALITY IN PLANNING

In the 1990s, a new 'style' of planning started to emerge, championed by authors like Edith Innes, Patsy Healey, and John Forester, heavily influenced by Habermassian communicative rationality (meaning, on the work of German philosopher and sociologist Jürgen Habermas). Communicative rationality is concerned with clarifying the norms and procedures by which agreement can be reached and is therefore a view of reason as a form of public justification (Bohman & Rehg, 2007). This 'public justification' is irrevocably intertwined with notions of democracy, diversity, and justice.

Public justification is also a form of shared truth-forming. As we saw with Rawls (2005), truth concerns validation, whereas justice determines acceptability: what is acceptable or not acceptable as outcomes of people's and institutions' actions and agreements. Both contribute to the formation of a democratic public sphere.

This 'communicative turn' described by, among others, Healey (1996) is important for planners, designers, and managers of the built environment, because it has far-reaching consequences for how they act and interact with others influencing the allocation of resources in the city (distributive spatial justice). In this perspective, planners, designers, and managers of the built environment must make efforts to include the voices of a variety of stakeholders to discuss any given issue arising from the distribution of resources in the city (procedural spatial justice).

These ideas also imply that citizens have a duty to participate in civic debate (Rawls' 'duty of civility') and, as pointed out by Morgan-Olsen, they also have a duty to listen to each other and to the arguments emanating from a variety of sources (Morgan-Olsen, 2013). As we have seen, these issues and more make public participation difficult, even if it is highly desirable.

British planner Patsy Healey offers a step forward to incorporating these ideas into planning theory and practice, and explains the possibilities of a 'communicative turn' in planning asserting that:

> ...from the recognition that we are diverse people living in complex webs of economic and social relations, within which we develop potentially very varied ways of seeing the world, of identifying our interests and values, of reasoning about them, and of thinking about our relations with others. The potential for overt conflict between us is therefore substantial, as is the chance that unwittingly we may trample on each other's concerns. Faced with such diversity and difference, how then can we come to any agreement over what collectively experienced problems we have and what to do about them? How can we get to share in a process of working out how to coexist in shared spaces? The new wave of ideas focuses on how we get to discuss issues in the public realm (Healey, 1996: 219).

Healey asserts that ideas of communicative rationality focus on ways of 'reconstructing the meaning of a democratic practice', based on more inclusive practices of 'inclusionary argumentation'. For Healey, this is equivalent to a form of

> Public reasoning which accepts the contributions of all members of a political community and recognises the range of ways they have of know, valuing, and giving meaning. Inclusionary argumentation as a practice thus underpins conceptions of what is being called participatory democracy (Fischer, 1990; Held,

> 1987) [...]. Through such argumentation, a public realm is generated through which diverse issues and diverse ways of raising issues can be given attention. In such situations, as Habermas argues, the power of the 'better argument' confronts and transforms the power of the state and capital (Healey, 1996: 3).

There are close connections between Rawls' and Sen's theories of justice and Habermas' communicative rationality. For Healey, Habermas' ideas have the potential to reconstruct democratic practice towards more inclusive participatory forms of democracy based on inclusionary argumentation. Inclusionary argumentation implies public reason that 'accepts the contributions of all members of a political community and recognizes the range of ways they have of knowing, valuing, and giving meaning' (Healey, 1996: 219). As a practice, Healey argues, it has the potential to regenerate the public realm in which diverse issues and diverse ways of raising issues can be given attention. In such situations, 'the power of the 'better argument' confronts and transforms the power of the state and capital' (Healey, 1996). We posit that communicative rationality has the power to make sense of, and distribute justice.

In this sense, the communicative turn in planning recognises that communication plays a central role in achieving agreements about how spatial burdens and benefits should be distributed. It goes further to posit the inclusion of 'alternative rationalities', that is, the need to include silent or oppressed groups in the dialogue and communication so as to maximise the chances of just agreements being reached, as the exclusion of certain groups from communication and decision-making leads to unfair/unjust outcomes for those groups. This idea is at the core of procedural spatial justice and includes issues of democracy, participation, diversity, accountability, transparency, and more. This is also very close to contemporary thinkers' ideas on the distribution of power by the recognition of alternative rationalities, such as Foucault's Power/Knowledge theory (Foucault, 1975; 1990; Foucault & Gordon, 1980) and Paulo Freire's Pedagogy of the Oppressed (Freire, 2018 [1968]).

Citizen participation as an activity underscoring procedural justice in planning encompasses a large variety of engagement and participation methods, in practice mostly related to the lower steps of Sherry Arnstein's famous 'ladder of participation' (Arnstein, 1969). But citizens' participation and citizen engagement are not without problems. For Parvin (2018), most democratic theory 'implicitly or explicitly assumes the need for widespread citizen participation'. Parvin points out that not all citizens have the opportunity to participate nor are they willing to. In any case, Parvin ponders, citizens do not participate in the numbers that theorists of participation think are necessary (Parvin, 2018: 31).

Reasons for low levels of citizen engagement in policymaking abound and are as much related to governance styles and other political, cultural, and economic factors as they are to public officials' unwillingness or lack of capacity to engage citizens.

However, in order to advance the idea that communicative rationality, public reasoning, and public justification can deliver urban policy that is both (i) better informed about the pleas, needs, and wishes of all citizens and (ii) more just, because it includes a large range of stakeholders and the voices of the vulnerable and silent, we must find innovative ways to encourage citizens to participate and enable policymakers to guide more meaningful and fruitful forms of engagement. We must also find innovative ways to teach these issues in the classroom, so that students develop an understanding and sensitivity towards justice as a public construction and a necessary outcome of spatial planning.

Despite the serious critiques to participatory processes, it is difficult to imagine the Just City without participation and co-creation, following the ideas of French Marxist philosopher and sociologist Henri Lefebvre and his concept of Right to the City (Lefebvre, 1968), that is, the right to shape your living environment to your needs and desires, or in other words, the right to participate in the governance of the city, fully embracing the 'politics of space'.

5. EXERCISES DISCUSSING SPATIAL JUSTICE IN CLASS

To this effect, we have developed four exercises that present the issues discussed above for the course 'Research and Design Methodology for Urbanism' offered in the third quarter of the Urbanism Master's track at the Faculty of Architecture and the Built Environment (also known as Bouwkunde) of the Delft University of Technology. The exercises are presented briefly and a short discussion on applications ensues. This course runs parallel to a research and design studio on regional planning and design that addresses the double challenge of sustainable transitions to sustainability and spatial justice. It aims at enabling students to do academic research that will support and provide a foundation for their work in the studio. In this course, students focus on traditional forms of academic research, which they must connect to less traditional forms of research in the studio, like 'research by design'. This connection between traditional and non-traditional (design-based) forms of research is one of the characteristics of education and research in the Department of Urbanism of TU Delft. The methodology component helps students explain what a theoretical framework is; build a theoretical framework that sustains research and design in the studio; identify a community of authors and practitioners who write about the core ideas in students' theoretical frameworks; and finally, write an academic report, in which students explain the values connected to and the ethical issues involved in the activity of planning and designing for people.

EXERCISE 1: THREE CHILDREN AND A FLUTE

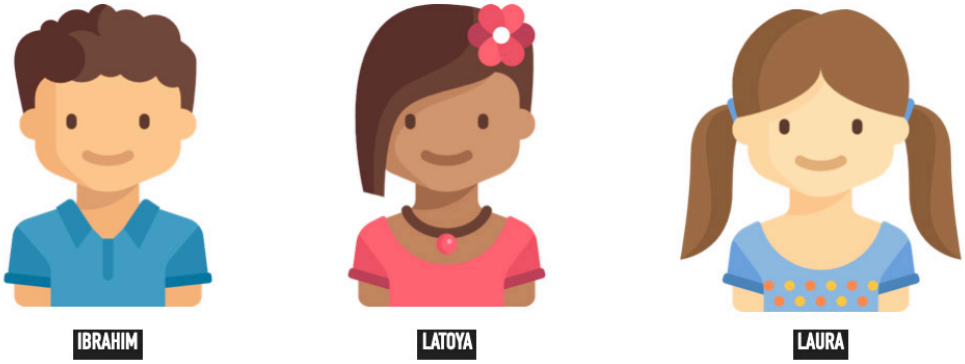

Figure 3: Three children and a flute is a story conveyed by Amartya Sen in his book *The Idea of Justice* (2009). The children's names are different from the ones used in the book. Free icons designed by Freepik https://www.flaticon.com/free-icon/ via @flaticon

This exercise is derived from Amartya Sen's book *The Idea of Justice* (Sen, 2009: 13) in which the author tells the story of three kids who must decide who will get a flute over which they are quarrelling. In this example, we explore how competing reasons of justice can be advanced and how each argument has an internal validity of its own.

The objective is to discuss competing claims of justice and the idea that a resolution can only be found (imperfectly) in public reasoning, in which the claims of each child are measured against the other claims and an (imperfect) decision must be made by the participants of the exercise in a public reasoning exercise. Participants measure the arguments given against their own values, priorities, and arguments. It is important to highlight that all arguments must be reasoned, and everyone gets a chance to speak.

First, the arguments are introduced one by one:

Ibrahim says he is the only one who know how to play the flute, hence letting him have the flute makes more sense, as he will make the best use of it. The others confirm this is true, they do not know how to play the flute.

Latoya says she is very poor, and the flute will make her happier, as she doesn't have any other toys. The other children have lots of toys and having that particular flute does not make much difference to them. The others confirm they do have lots of toys.

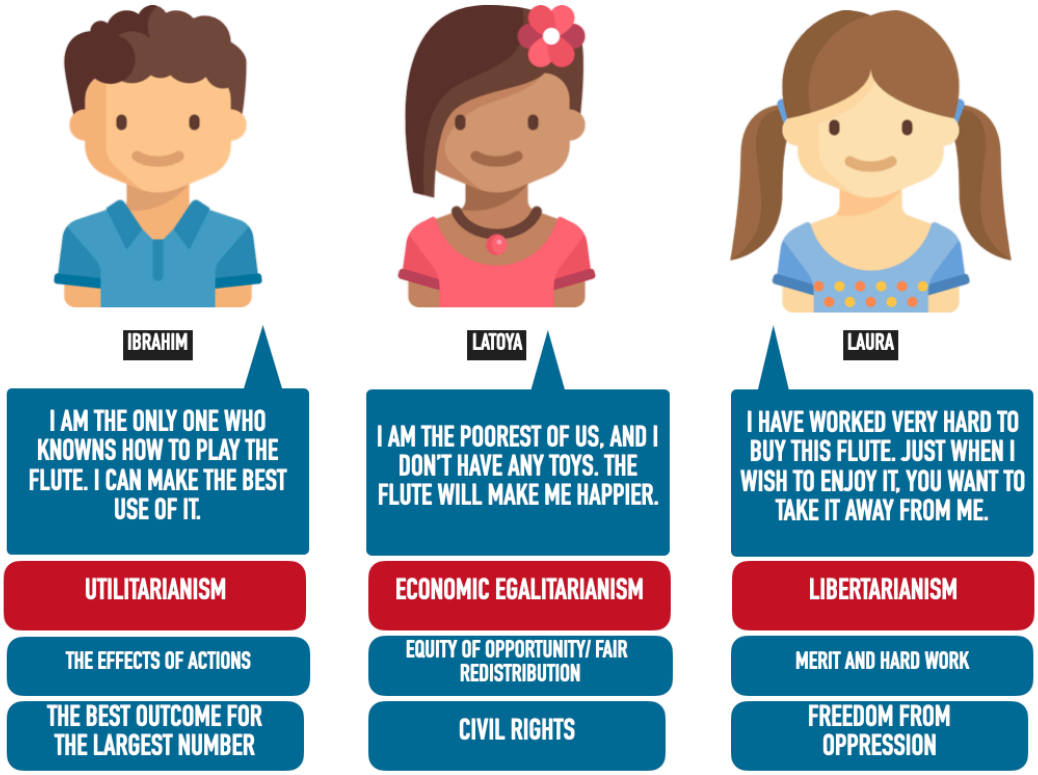

Figure 4: Summary of the political perspective each child represents: Utilitarianism, Economic egalitarism and Libertarianism. Source: Sen, 2009. Free icons designed by Freepik https://www.flaticon.com/free-icon/ via @flaticon

Finally, Laura says she worked very hard to make that flute, and just when she wants to enjoy it, the others want to take the flute away from her. The others confirm this is the case, Laura has indeed made the flute.

After the arguments are explained, and students decide about who should have the flute, they are encouraged to explain WHY that should be the case. The students hear the initial arguments from the children, but they also hear the reasoning from other students, which may influence their own positions.

This is not a role-playing exercise, as students are asked to advance real arguments in which they believe. A voting round may take place using a simple raising of hands or an online voting tool, such as Mentimeter. After voting takes place, the results are discussed and an explanation for the decision is sought.

After results are known, the position of each child in a longer philosophical tradition of justice is explained. Ibrahim is a Utilitarian; Latoya is an Economic Egalitarian and Laura is a Libertarian. The main characteristics of each school of thought are explained and debated.

This exercise has been conducted several times in the course mentioned and in other settings as well. Results invariable point towards consensus being reached about who the flute should go to, even though the debate around it might get quite heated.

In general, students tend to give priority to egalitarianism, even though they are discouraged by the fact that Laura 'owns' the flute (the argument being that the flute is rightfully hers, since she made it) and students often see ownership as the overriding value.

This triggers further debate on how private property is dealt with in advanced liberal democracies and the realisation that although private property is a central tenet in liberal democracies, it can be sometimes overridden either for distributive or utilitarian reasons.

The main outcome is that students realise consensus can be reached, but any solution offered is imperfect, has pros and cons, and must be reasoned collectively.

EXERCISE 2: THE TRAGEDY OF THE COMMONS & ITS RESPONSES

In this exercise, we explore the famous 'tragedy of the commons' as described by Garrett Hardin in his famous 1968 article 'The Tragedy of the Commons' (Hardin, 1968), in which he gloomily warns about the, in his view, inevitable exhaustion of common resources by the pursuit of self-interested rationality. Hardin fully accepts this logic and does not seek for alternative explanations. Using Hardin is problematic, because of his racist worldviews. In the words of the American civil rights organisation Southern Poverty Law Centre, Hardin 'used his status as a famous scientist and environmentalist to provide a veneer of intellectual and moral legitimacy for his underlying nativist agenda' (SPLC, 2019).

In the 'tragedy', individuals who have access to a resource unfettered by social structures or formal rules governing their use act according to their own self-interest (following rational choice theory) with little incentive to limit extraction of the resource, causing depletion of the resource through uncoordinated action.

Despite his ideology tinting his scholarship, Hardin's explanation of the tragedy of the commons (a much older idea originating with British economist William Forster Lloyd in 1833) has been widely used to advocate for privatisation of common resources, allegedly to promote their better use and preservation.

In his article, Hardin blames uncontrolled population growth and a 'Malthusian catastrophe' for the inevitable collapse of world resources. It is difficult not to read here the idea that population growth happens mostly in developing nations, which are overwhelmingly non-white, and preserving 'our' resources means preserving resources from 'them'.

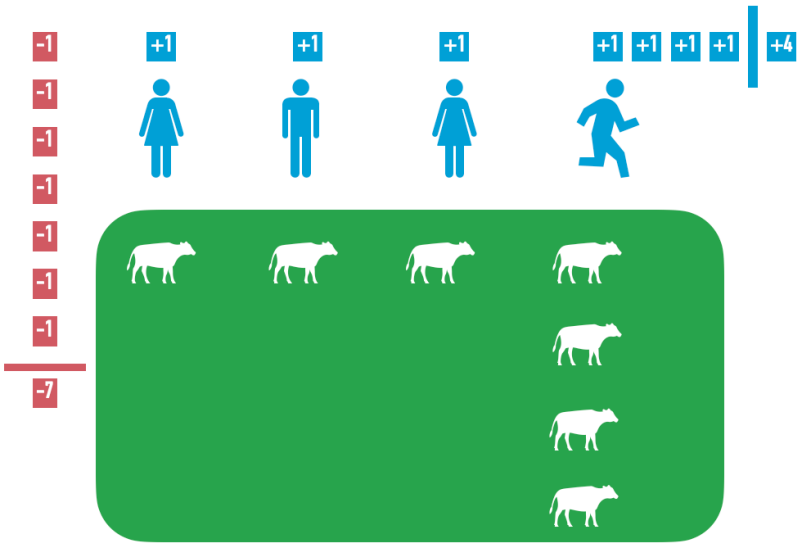

Figure 5: The famous field where a community of farmers puts their cows to graze. In blue, the positive utility of the cows. In red, the negative utility of the field. There are also positive and negative externalities, not explored in this text, that qualify the ownership of cows grazing in the field. This example comes from Hardin, 1968.

Although common resources may collapse due to overuse (such as in overfishing or overextraction of water), throughout history humans have come up with numerous ways to prevent it, through cooperation, regulation, and societal control.

In 2009, Elinor Ostrom was awarded a Nobel Prize in Economic Sciences for demonstrating that traditional and modern societies are often successful in regulating the commons, and that rational choice theory is not a universal predictor of human behaviour. Ostrom shared the prize with Oliver Williamson, a University of California economist. Ostrom was interested in how humans collaborate and manage their resources for the common good. She concluded that rational choice theory seems to ignore the capacity of people to collaborate and reach mutually beneficial agreements, often in communicative exercises.

It is important to note, however, that the exhaustion of common resources does occur and part of the issues generating climate change and natural devastation can be explained via this logic. The idea that unchecked population growth affects the use of resources that Hardin advanced is intuitively correct, but this position has been challenged by the fact that countries in the global north are the main culprits for the exhaustion of natural resources and for carbon fossil emissions, independently of their share of the world's populations (Rocha et al., 2015).

In this exercise, we turn Hardin's argument upside down by highlighting different issues and by inviting students to reflect on how communicative rationality can deliver more just outcomes. The objective is to discuss how public reasoning can deliver more just evaluations of justice.

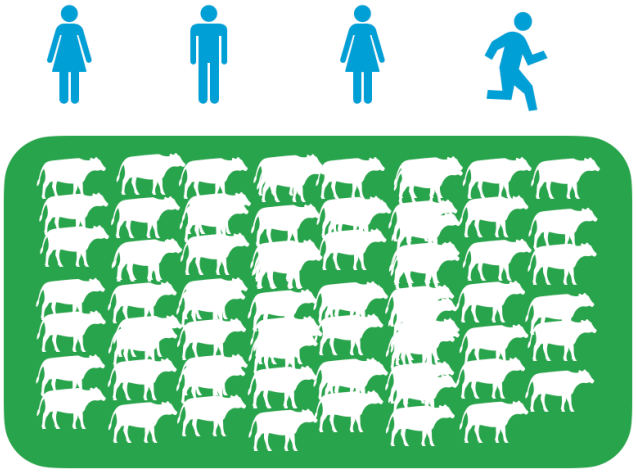

Figure 6 Representation of a collapsed field, where too many cows were put to graze by farmers who, following rational choice theory strictly, have lots of incentives to put more cows to graze, and little incentive to control the number of cows. This example comes from Hardin, 1968. The example has been adapted for this exercise. This theory has been largely debunked by proponents of polycentric governance.

In the first step of the exercise, a simple mathematical equation is explained to students. A community of four farmers owns a field in common. Each of the farmers puts one cow to graze in the field. Each farmer earns the positive utility of one cow (+1) and the field has a negative utility of 4 cows (-4).

But one disturbance is introduced with one of the farmers inheriting money from a relative and hence being able to introduce three more cows to the field (here's our 'structural inequality'). His positive utility is increased to +4, while the negative utility of field grows to -7. The sum of positive + negative utilities for each farmer is -7/4 (+x), where x is the number of cows each farmer puts to graze in the field.

This results in -0.75 (negative utility) for each of the farmers with just one cow and +1.5 (positive utility) for the farmer with 4 cows. This means that while the gains are individual, the losses in the field's utility are shared by all. The incentives for each individual farmer to put as many cows as possible to graze in the field are high, while the disincentives are low. If we follow rational choice theory, as conceived by liberal economists, farmers see an incentive to put as many cows to graze as they possibly can, leading to the collapse of the resource.

Students are invited to reflect and debate on the justice of this arrangement and to extend the concept of the commons to the planet. Students are also invited to decide on possible rules that would allow the sustainability of the resource, and thus to reflect on the ability of societies to regulate the use of common resources fairly. They are also invited to reflect on the concept of the commons itself, as opposed to private property, public property, and other arrangements. There are a large number of issues contained in this example, such as power imbalances, taxation, regulation, governance, freedom, property, and so on, which makes the resulting debate exceedingly lively.

EXERCISE 3: THE SHARK HOUSE DILEMMA

Figure 7: The Shark House in Headington, Oxford, UK. Photo by Magnus Hanson-Heine. Printed with permission. For more information about the Shark House, please visit: www.headingtonshark.com

In this exercise, students are invited to reflect on individual rights and freedoms and the creation and maintenance of public goods by analysing a real-life example, the Headington Shark. The Headington Shark (whose official name is 'Untitled, 1986') is a rooftop sculpture located in Headington, Oxford, England, depicting a large shark going through the roof of a house. The shark was commissioned by the then owner of the house, Bill Heine, a local radio presenter, to represent one's 'feeling totally impotent and ripping a hole in their roof out of a sense of impotence and anger and desperation... It is saying something about CND, nuclear power, Chernobyl and Nagasaki' and was sculpted by John Buckley (Hanson-Heine, 2022).

This example allows students to discuss the limits to private property, individual freedom, freedom of expression, artistic freedom, safety regulations, aesthetics, heritage and more.

An expanded version of this exercise involves a role-playing game in which students are invited to play different stakeholders in a debate where they need to decide on several options available (to remove or to preserve are just two of the options) and to write policy based on the experience. Writing public policy based in the discussion allows students to think in terms of public justification and public reasoning.

The roles in the roleplaying game include, for example, the owner of the house, their neighbours, a councilwoman, the president of Headington's heritage conservation society, shop owners in the area, children, an artist, a planner, a lawyer, a member of the city's firefighters, and so on. They all have diverging interpretations of the Shark and the challenges posed by the sculpture and, consequently, have different justice claims. They also see different solutions and may seek different coalitions and partnerships to achieve their goals. In the end, they must find a compromise and a way to go forward.

EXERCISE 4: A MANIFESTO FOR THE JUST CITY

Figure 8: Composite with the covers of two books published by TU Delft OPEN with the results of the Manifesto for the Just City workshop in 2021 and 2022, respectively. Both books are available from http://books.open.tudelft.nl/home

In this exercise, students are invited to write a Manifesto for the Just City, a 1000-word text in which they express in groups their ideas about what the Just City should be. Group work is central for the objectives of this exercise, as it is a collective visioning exercise, in which conflicting ideas about justice might play a role. It was partly inspired by a workshop given by David Roberts from the Bartlett School of Architecture at UCL, during the International Seminar 'Teaching Design for Values' at TU Delft. This workshop is described by Roberts in Chapter 7.

Manifestos are short documents that aim to convey the ideas, values, and goals of a group or organisation. Political parties and artistic movements have made extensive use of manifestos. But architects and urbanists have produced quite a few manifestos too. The *Charter of Athens* (1933) is a long and detailed manifesto about Modernist principles in architecture and urbanisation, much criticised for its Euro-centric and one-sided view on urbanisation. In 2003, a *New Charter of Athens* was published, focusing on spatial planning as 'vital for the delivery of Sustainable Development'.

At the Manifesto for the Just City, students take part in an online workshop organised by TU Delft and partner universities (the Institute for Housing and Urban Development Studies (IHS) of the Erasmus University Rotterdam; the Winston-Salem State University of North Carolina, USA; the University of Illinois at Urban Champaign, USA; the Morgan State University of Baltimore, USA; and the Cape Peninsula University of Technology of Cape Town, South Africa, and a host of universities around the world who took up this exercise as a course exercise).

During the workshops, students listen to lectures from leading scholars around the world who discuss issues connected to spatial justice, representation, distribution, and so forth. Examples are, Professor Faranak Miraftab from the University of Illinois,

the leading scholar on insurgent planning; Tainá de Paula, an architect, urbanist, and city councilwoman for the city of Rio de Janeiro; Leilani Farha, former UN Rapporteur for the Right of Housing; the Israeli civil rights advocacy group BIMKOM Planners for Planning Rights, who advocate for vulnerable populations in Israel through planning legal rights, including Arab Israelis – that is, Palestinians with an Israeli passport who see their communities ravaged by the misuse of planning laws – and more.

After listening to speakers, students typically have many questions and offer testimonies about how a certain topic is experienced in their own countries. After the Q&A, students are invited to random break-out rooms where they must debate with students from other countries and come up with statements related to the lecture they just watched. These statements are written with people the students have just met, and the objective is to make them discuss. Statements are made available on Google Docs and serve as inspiration for the final texts of the manifestos.

Students also receive a manual on how to write a manifesto, with a short history of manifestos, examples, and instructions on how to write them. Students are encouraged to make their manifestos not only textually robust, but also visually attractive. The idea is that manifestos should work as calls for action and must inspire people.

In the two editions of this workshop organised so far, more than 900 people from more than 100 universities from all over the world took part in the online workshops, although not all of them necessarily deliver a manifesto at the end. In the first workshop (2020) 43 manifestos were delivered by 172 students from 25 universities. In the second edition (2021), 63 manifestos written by 256 students from 48 universities were delivered and then published in book format.

All manifestos delivered are published. In case there are problems with language or content, students are coached on how to improve their manifestos. The idea is to give a voice to a very wide range of students from the most varied backgrounds and educational traditions, which makes the manifestos very varied. Topics include, not surprisingly, housing, mobility, public spaces, the right to the city, inequality and injustice, gender, critiques of capitalism and the fossil fuel-based economy, critiques of the growth-based economy, critiques of planning itself and of politicians. Manifestos invariably advocate for inclusion, diversity, and justice. There is a huge variety of topics add approaches, but many manifestos are rather conventional and 'careful'. We hypothesize that students are exceedingly careful, and many come from educational traditions that do not encourage students to speak up, but rather to comply with pre-established ideas. This experience deserves another chapter by itself, which we hope to write soon. First and foremost, the Manifestos for the Just City have an experiential value, as they expose students to a larger community of people with different values and life experiences. In the words of Professor Romola Sanyal (Rocco & Newton, 2022), we wish to build upon the idea of a global dialogue of equals, that gathers a community of people, teachers, and students around ideas about the Just City and Spatial Justice.

6. FINAL REMARKS

The four exercises described here cover a lot of ground in terms of the issues they address and how they deal with competing justice claims. They do so through communicative exercises that embrace the complexity of the topic, and focus on spatial justice, in which competing claims and competing reasons for justice play a role.

The four exercises are communicative exercises that explore public justification and public reasoning. Justice is explored in its complexity, with all the shortcomings that public reasoning exercises have (limitations of representation, in-group bias, problems with vocabulary to express arguments, implicit and explicit biases, and more), but are nevertheless fruitful in the terms of the richness of results and the realisation by students of the political and public nature of spatial justice.

According to Professor Faranak Miraftab (Miraftab, 2009; 2018; Miraftab & Wills, 2005), our minds are colonised by preconceived ideas about self interest, profit and competition. Those ideas are meaningless unless we agree on how we will live together in our cities, and on a planet whose resources are finite.

There is no freedom possible outside of a society in which we all collaborate with each other, so we can all be free. In the words of Sen (2009), sustainability is meaningless if we do not have sustainable freedom: the freedom to continue to live on this planet in harmony with its natural systems. But in order to do that, we must agree on how the burdens and the benefits of our association must be distributed.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

DECOLONISING DESIGN: 'CONSCIENTIZAÇÃO' OF VALUES THROUGH DESIGN STORIES

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ABSTRACT

People experience a world designed for and by humans, but how much are designers aware of how our personal beliefs shape our professional choices? and simultaneously how do the world communities we live in design our beliefs? This chapter situates diverse professional design practises within critical decolonial reflection and is an invitation to unpack Western hegemony that has taken our planet to the brink. Decoloniality praxis and theory opens doors to consider a plurality of perspectives including those that originate from the Global South, and questions the neutrality of the Western model of thinking. Decolonising requires each of us to ask ourselves questions about our daily practises in our professional careers, to build our '*conscientização*'. We propose thinking about our 'Design Stories' as expressions of our values to redesign for the whole web of life.

DECOLONIALITY, CONSCIENTIZAÇÃO, COMPLEXITY THINKING

1. INTRODUCTION: AN INVITATION TO DIALOGUE

We would like to postulate that there are two root questions that run through conversations about values in design: Is the work of design ever value-free? And whose values shape design?

These questions are central to the dialogue we present in this paper to reflect on values in design from a decolonising lens using conceptualisations developed in Latin America. Decoloniality postulates that Western knowledge is hegemonic, it is exported as if universal and as if neutral, and therefore defines design in the modern world according to one set of values. Decoloniality represents for *Latinoamérica*, and other areas of the Global South, the detachment of the Eurocentric base of power, the disengagement of the logic of modernity and the rise of alternate epistemologies. It has been developed by Latin American thinkers such as Quijano, Castro Gómez, Lugones, Dussel, Walsh, Cusicanqui, Mignolo (Lander, 2000) and taken on by other Global South advocates and thinkers such as de Sousa Santos. Decolonial thinkers postulate that other knowledges are possible, knowledges that are intercultural and transmodern epistemologies of the South.

Decoloniality is about social justice and about questioning the dominance of Western values that exclude the myriad of other value systems on our planet. If we accept that design permeates all aspects of our lives, and it is everywhere in our daily experiences, then we argue that decolonising design becomes essential for inclusion, social justice and for our very survival. At a crucial era in humanity's history on our planet, decoloniality offers a lifeline for the transcultural and ecological changes we need for the survival of our planet (Escobar, 2017).

This is not an exhaustive and comprehensive paper on decolonising design. It is rather an invitation for you to take steps together with us to forge deeper understandings of who we, each one of us, are as designers, and what values are consciously and unconsciously imbued in our designs. How do we explore our values and biases and remain open to reflection with empathy?

To support self-reflection on the questions we are postulating, we will use a pedagogical conceptualisation from the Brazilian educator, Paulo Freire: '*conscientização*'. This is a pedagogical philosophical concept that Freire developed in his book Pedagogy of the Oppressed (1970) to describe the process of self and societal awareness that all educational projects should have at their heart to uncover social, political, and economic injustices.

In this chapter we introduce a variety of design stories from various sources, from personal stories to examples from crowd sourcing resources such as Wikipedia, company websites, magazine articles, and blogs. As we narrate some design stories, we pose questions about 'neutrality' in these designs through the lenses of decolo-

niality, and using the pedagogy of *conscientização*. Each design story will be framed by reflexive musings by the authors - one who is Dutch, with a background in engineering, and the other who is Latin American and with a background in child psychology, both keen students of decolonial thinking. Decoloniality asks us to question what knowledge is, to ask who decides what knowledge is valid? where knowledge emanates from? and whether knowledge can be universal or is it always situated in social and historical contexts? Our aim is to situate the design stories narrated in this chapter and open up to various forms of knowledge and of knowing.

The design stories come from a wide range of design fields and adopt a broad understanding of design. We invite your participation as a reader to join us to challenge ourselves and unlearn what we think of as objective, neutral knowledge. In each section we invite you, through dialogue boxes, to self- reflection and critical questioning of both our ideas and values, and your own, with the intention of developing *conscientização* in our learning. *Conscientização* invites us to have and to nurture a critical stance in our learning that is both political and empowering. Decolonial thinking asks us to take a systemic look into design as a human endeavour and to engage in design for the pluriverse, as invited by Arturo Escobar (2018). We conclude that it is essential to understand ourselves within our contexts, our communities and our values, as co-designers of our world.

2. IS DESIGN EVER NEUTRAL?

Figure 1: Hittite Jug, Turco-Italian Archaeological Expedition at Karkemish, Smithsonian Magazine. https://www.smithsonianmag.com/smart-news/worlds-oldest-smiley-face-found-hittite-jug-180964177/ Printed with permission of the Department of History and Culture from the University of Bologna. No further use allowed.

So back to our first question: Is design ever neutral in the first place? Let's take a look at something seemingly simple like the smiley face. The smiley face is slightly older than we expected.

The smiley, as an ideogram that represents a smiling face, has its earliest known representation in a strikingly modern form on a Hittite jug from 3,700 years ago in Turkey (Borschel-Dan, n.d.; Daley, 2017). Designed in 1963 by Massachusetts-based designer Harvey Ball, the modern-day smiley was apparently conceived in approximately ten minutes. 'I made a circle with a smile for a mouth on yellow paper', explained Ball, 'because it was sunshiny and bright' (Silzer, 2019).

With the increasing popularity of the computer, the smiley face was initially represented as an emoticon formed by three text characters :-). As technology evolved, the means of displaying images improved, and when the smiley face could be displayed in full colour, it morphed into the emoji. The emojis we use today were invented in Japan in the 1990s, and the explosion of fast messaging with images threw up a whole emoji encyclopaedia of thumbs up, waving hands, crying faces and so on that we use today. Originally, emoji faces were all yellow with an assumed whiteness that has been corrected in recent times with an array of skin colours available for some limited emoticons. Roxanne Gray aptly describes the racial assumptions behind the emoji characters in the title of her article 'The unbearable whiteness of emoji,' and raises the need for questioning an assumed post-racial world (Gray, 2013) where a few add-ons are used to create a cosmetic façade of diversity.

Design is a human activity, by humans and for humans. It seems obvious to assert then that the simple answer to the question of neutrality in design is that design is a human endeavour and therefore never neutral (Escobar, 2018; van den Hoven et al., 2015). The simple smiley face shares very similar design features across time, in the simplicity of lines used and the obvious message of happiness it conveys. However, depending on the particular setting, context and culture, the use of the smiley varies, whether it is for profit, for message sending, for punctuating an idea, for representing or, as Gray points out, for erasing a group of people.

Conversations around race and representation are happening now in workplaces, in real world living spaces, and in all the design spaces we inhabit. The questioning of inequity, privilege, segregation, exclusion of diversity, is rightly, and finally, in our view, taking centre stage in universities, institutions and political entities across the world. It is within this context of questioning [the lack of] representation in design-based disciplines that we are looking at design as always being value laden and hence political. Decolonising design means to disrupt the designed world, and we propose using Paulo Freire's concept of '*conscientização*' for the designing of a more equitable world. Decolonising differs from decolonisation in that it refers to the colonising thought structures we still live within after decolonisation. Decoloniality poses the questions of who designs, whose values are embedded in the design, who is represented in a design, etc. We will come back to this in more detail further ahead.

3. DESIGN STORY: WE COLOUR OUR WORLDS

Fig. 2: Coloured pencils manufactured by Berol. Photo by Sam George (Cira), Public domain. Source: https://commons.wikimedia.org/wiki/File:Berol_prismacolor_pencils.jpg.

We would like to introduce the questioning of neutrality in design with a real story from the world of children. It starts in Elizabeth's childhood and still impacts her professional work as an educator and psychologist with young children.

When I was a child growing up in Caracas, I loved my set of Berol Prismacolor drawing pencils. The big sets had pencils in rows of deeply satisfactory graded sequenced colours. Each pencil had a number and a name, the giant sets had all the numbers in sequence. My set was not a giant one and did not have ALL the colours, it was the 48 Art Colour set and was a thesaurus of colour names: 921 brick red, 922 scarlet red, 923 pure red, 924 crimson red, 925 was not in my set. Next to 926 carmine red was the pinky peachey one: number 927, named flesh. This was the default skin colour and it was a given. As a 7-year-old, I certainly did not question the lack of representation of children with other skin colours in my box of colouring pencils. These names have changed since I was a girl, but has the assumption of peach being the default skin colour changed?

As a psychologist and an educator, I see and hear children as young as two and three reflect back to us adults their observations of the world we create for them: they choose light peach as the default to colour a person; in play I overhear them say only boys can be doctors or that girls cannot be superheroes, that women cannot be the bosses of men, that being dark skinned is dirty, and I hear too often brown skinned children who say they don't like their skin colour and they choose peach to colour themselves. These are all stories I have witnessed.

A research project carried out in Belgium in 2018 by the School Network SOM (Samen Onderwijs Maken) asked some children to be a part of a study titled 'The Skin Colour Experiment', with results that echoed Elizabeth's childhood experience (COTW, 2019). As the project's website notes:

The children were told to pick a coloured pencil to use to fill in 'skin colour' on a drawing of a person. Every child picked the light pink shade – even children with skin tones much better matched by other pencils in the box picked this pink colour.

What stands out in the answers of these children is that changing the names of the colours does not suffice to change the notion that 'light peach' is the default skin colour. The reality is that the categorisation of skin colour and the racialisation of humans has been forged for hundreds of years in the sciences, in the arts, in technology, in trade, and in design. So, a simple change of colour names is of course not sufficient for all children to see themselves represented in the world. Equally, the changes being called for at all societal levels for Diversity, Equity, and Inclusion are not going to make an impact if we limit ourselves to an additive name-changing box-ticking exercise. Maybe if we question prevailing paradigms, we can change children's experiences of growing up in more inclusive societies.

A set of colouring pencils for children is a designed object with embedded values. Observing its uses reveals assumptions about which skin colour is the 'norm', whose lives matter and what are the unconsciously prevailing racist epistemologies. Why are children still using peach as the default skin colour when we assume that we are not teaching them these racist notions? However, this is what they are learning. In society and in schools, we are teaching our unconscious biases. This is relevant to all design professions and professions that design.

Designers are both shaped by society and shape society, as design reflects the dominant culture, and also designs the culture. Design is not neutral. Design is value laden, but whose values are being put centre stage? What values do you bring to your professional and student life every day and how do your beliefs and unconscious biases impact your designs and colour the world you see around you?

> '...design is literally everywhere; from the largest structures to the humblest aspects of everyday life, modern lives are thoroughly designed lives....' (Escobar, 2018, Introduction).

Children live in the world we have designed, which they reflect back to us, opening our eyes and making us question the prevailing organisation of the modern world. Arturo Escobar, the author of the thought provoking 'Design for the Pluriverse' affirms that design, as it is taught and practised in most schools, emerges from the epistemological West, from knowledge produced in the Global North. Latin American decolonial thinkers point at this dominant body of Western knowledge as hegemonic. It is exported as if universal and as if neutral. Western based knowledge defines design

in the modern world according to its own set of values, rooted in Greek, Roman, Judaic, and Christian traditions, such as rationalism, enlightenment, secular humanism, postmodernism, etc. (Means, 2012). As Escobar notes:

> Today we would say (ontologically) that development policy and planning, as well as much of what goes on under the banner of design, are central political technologies of patriarchal capitalist modernity and key elements in modernity's constitution of a single globalized world (2018: Introduction).

Decoloniality is a critique of the Western paradigm that has been dominant at the expense of other ways of seeing and being in the world, erasing other epistemologies. Decoloniality grants that Western knowledge production is valuable, but calls for it to be situated in its rightful place historically as not neutral, as having originated in Europe and not universal. De Sousa Santos (2014) describes how Western knowledge undermines the richness of epistemologies from around the globe. The resulting erasure systematically destroys other ways of making knowledge, which de Sousa Santos characterises as 'Epistemicide'. Decoloniality invites you and me and us, as individuals, as collectives, and as members of educational institutions, to open up to a multitude of perspectives and of epistemologies, in turn to address what de Sousa Santos calls 'cognitive justice' (2009: 8).

DIALOGUE BOX 1: DESIGN ARTIFACT

EXPLORE DIFFERENT PERSPECTIVES AND VIEWPOINTS ON A DESIGN.

In this dialogue box we invite you to explore an artefact from your childhood. We ask you to view this designed artefact from the perspectives of others and how the design may impact their equity and inclusion when they interact with the design.

Now imagine how it may be experienced by:

- a person with a visual impairment
- a 10-year-old child immigrant to the Netherlands who is learning Dutch
- a Peruvian hydroelectric engineer

1. What can the person ***perceive in the design object***?
2. What might the person ***know about the use of the object***?
3. What might the person ***care*** about?
4. Would you ***modify*** the design artefact and if so, how?

Adapted from Project Zero Thinking Routines Toolbox https://pz.harvard.edu/resources/step-inside

4. DESIGN STORY: FACE VALUE IN ALGORITHMS

We have raised the question of neutrality as central to the discussion of values in the design process and praxis. That design is never neutral is not a new idea in the design world (van den Hoven et al., 2015). This is often tackled in the teaching of ethics in design and technology by compartmentalising domains and practises: design for specific values such as for democracy, for well-being, for sustainability and ecology; or for specific fields of design, such as architecture, artificial intelligence, engineering, graphic design, industrial technology, and so on. Values in Design is a growing field of research where researchers explore how designers place specific values or political beliefs as central to particular design projects, impacting design decisions and the politics of artefacts such as in design for sustainability, design for democracy, design for inclusiveness, participatory design, value sensitive design (Friedman & Hendry, 2019). The design world and design schools are focusing on ethics everywhere we turn. The hardest question rarely posed is what values are being assumed? (Manders-Huits, 2011). What human rights are referred to? Who decides what are human rights? Are those assumptions universal? Who are they representative of? At the centre of these questions are the notions of neutrality and universality of values.

So, does this mean that the traditional idea of neutrality has been debunked in design education and praxis? The traditional design professions sit somewhere in a space between the so-called 'hard' physical sciences, the 'soft' social sciences and the arts. Hard sciences are embedded in a history of Western positivism, while the arts bring to bear other ways of seeing and being in the world. The social sciences may conceptualise the world in post-neutral paradigms and social constructivism. However, design, like science and technology, continues to be for the most part taught and practised with objective scientific paradigms and as if it were value-neutral (Miller, 2021).

The introduction to 'Design for Values' in the Handbook of Ethics, Values, and Technological Design (van den Hoven et al., 2015), states:

The design of new products, public utilities, and the built environment is traditionally seen as a process in which the moral values of users and society hardly play a role. The traditional view is that design is a technical and value-neutral task of developing artefacts that meet functional requirements formulated by clients and users. These clients and users may have their own moral and societal agendas, yet for engineers, these are just externalities to the design process. An entrenched view on architecture is that 'star' architects and designers somehow manage to realise their aesthetic and social goals in their design, thus imposing their values rather than allowing users and society to obtain buildings and artefacts that meet user and societal values (page 1).

For example, (software) algorithms already perpetuate certain biases (Buolamwini & Gebru, 2018; Dudhwala, 2020). The 'unbearable whiteness of emoji' (Gray, 2013) there-

fore has far reaching equivalents in pattern recognition software, which has proven to have strong biases towards race and gender. Contemporary technology in artificial intelligence needs to be trained with certain data sets in order to make distinctions between various binary categories, such as 'male' and 'female', 'adolescent' and 'elderly', 'Caucasian' and 'Asian', etc If the data sets that are used for training the algorithms consist mainly of young, white university students, the algorithm has too little input to discern between other categories, and will start to make mistakes. This can have serious consequences when this software is being used, for instance, in facial recognition software in surveillance cameras, and can lead to incorrect identification (Ensign et al., 2017). In the USA, it is well documented that the technology often fails to distinguish between different black people (Vogel, 2020). The consequences of 'Design for Values for AI' will be given ample attention in the chapter with the same name in this book.

Possible technological 'fixes' to the problem of representative data sets tend to hide the more fundamental problem of artificial intelligence technology, namely the labels and categories that are assigned to humans, which are used as input for the training sets of the algorithms such as those used for face recognition. Are these labels and categories objectively true and not value laden? Who chooses these labels and based on what evidence? For instance, if one tries to train a system to distinguish between 'male' and 'female' individuals or attributes, what features are being used to label them? What about people who do not identify with either category, or not in the same way that the system would categorise them? The purportedly 'objective' criteria to distinguish between male and female might be defended by pointing out biological differences, but can these be detected by looking at a face alone? More fundamentally, however, this approach ignores the many ways in which gender is perceived in society and by individuals:

In particular, face recognition technology reduces persons and their identity to their body and simplifies the plural nature of identity, as well as its meanings and functions, being committed to the idea that there is one and a single identity that must remain the same across time and space (Bacchini & Lorusso, 2019: 328).

This gender example with one seemingly simple distinction of two categories is already rife with issues related to design values. The complexity only increases as ethnicity, skin colour, dis/ability, and other categorisations are taken into account. These categorisations are value-laden and historically and culturally constructed (Giddens, 1991; Hacking, 2000; Hayles, 1999). As a result, the solutions offered by technological rationality create ethical conundrums that may not be recognised by practitioners. How are we learning together with our students to become aware of these issues? Miriam Vogel reminds us that our endeavours in AI are shaping our world in inadvertent ways:

While racism has permeated our history, AI now plays a role in creating, exacerbating and hiding these disparities behind the facade of a seemingly neutral, scientific machine. In reality, AI is a mirror that reflects and magnifies the bias in our society (2020).

5. DESIGN STORY: COLOUR BLINDNESS

In the design world, the use of colour provides various examples for questioning the neutrality of design categories. Designers know that people with colour blindness may have problems seeing the 'red', 'amber', and 'green' of a traffic light, which can lead to potentially dangerous situations in the public environment. As these colours are also often used in web designs to convey the messages of 'danger', 'beware', and 'safe', we often forget that these meanings are historically and culturally determined, and are often used to (maybe inadvertently) perpetuate Western ideas. In Chinese culture, for instance, 'red' is associated with power and glory. When the Chinese say that the stock market is in the red, it means that business is booming, while in English it means that stocks are going down (Bai, 2010).

Extensive studies show that our perception of colour differs over time and contexts, and can be associated with culture, social class, climate, education, gender, etc. (Kose, 2008; Miranda, 2012; Rose-Greenland, 2016; Surrallés, 2016). Such changes in the perception of colour show that the objective wavelengths our eyes can perceive do not translate into the objective labels we assign to colours, and the meanings that are associated with them.

We have been looking and questioning the ethical conundrums of algorithms within the language and the mindset of Western technology. In the next section, we return to the theories and language of social sciences, in particular that of decolonial thought, which can further reveal the inadequacies of staying within one single cultural hegemonic mindset.

DIALOGUE BOX 2: COLOUR MEANINGS

What are your colour associations?

Can you think of other examples where a category, like colour, is considered 'real'?

What meanings do you assign to colours?

What colour symbolisms are different in your culture to other cultures you may be designing for?

6. WESTERN HEGEMONY AND THE DECOLONIAL TURN

Technological rationality cannot resolve ethical issues around the categorisation of humans rooted in Western objective, dualistic, racist, sexist, ableist thought. Such technological rationality, that keeps emotional, social, human experience at a distance, is an analytic tool that clashes with theories of social sciences, such as decoloniality, and the thought traditions of many Global South cultures and indigenous peoples. The decolonial turn that has arisen in Latin America asks where knowledge production happens by questioning 'who designs', 'who teaches', 'whose truth is taught', 'who benefits from a design', 'whose truth is treated as universal truth for all', and 'how does this truth subjugate previously colonised nations, groups of people and bodies'? (Escobar, 2018; Grosfoguel, 2011)

Decolonial thinking has its roots in critical social perspectives arising in the last couple of decades from Latin American thought, and in the 500 years of resistance of indigenous peoples to the invasion, genocide, theft, and colonisation of their lands by imperialism (Galeano, 1997; Jared, 2005).

A frequent downplaying of the importance of decolonial thought is that colonies are part of a historical past that have been dismantled in the independence of the former colonies in Africa, Asia, the Americas, and Oceania. A conceptual distinction strips and unravels this downplaying critique, namely the distinction between colonialism and coloniality; decolonisation and decoloniality. These terms are distinct and reveal the essence of the decolonial framework (Maldonado, 2018).

Colonialism and decolonisation are the historical and geopolitical power structures of past imperial systems of European kingdoms subjugating other regions of the world: the Americas, Africa, and parts of Australasia. Colonialism, and the subsequent decolonisation, are the subject of historical studies. They are the past. In contrast, coloniality and decoloniality refer to the logic, the prevailing knowledge systems, the ontology, and the matrix of power that are the legacy of the massive processes of colonisation and decolonisation. This logic of coloniality prevails today in the systems of the modern world. The complex societal systems that developed under colonialism remain in social structures and discourses hence the modernity in which we live is rooted in coloniality. Decolonial Latin American thinkers affirm that coloniality, as we experience and live it, is the flip side of modernity: they are sides of the same coin of social reality (Lander et al., 2005).

Across the modern world, the Western systemic globalised paradigm prevails in political systems, fashion, movies, academic knowledge production, mental health paradigms, and so on. Its most humanist objective is to civilise 'others', to modernise us all: the barbarians, the natives, the working classes, the so-called 'dis/abled', the mad, the female, the migrants, the 'ethnic' groups, the dark ones.

For those of us engaged in decoloniality in all sorts of professions, decolonising is not an add-on, it is not another perspective to include, it is not 'let's make sure we are inclusive of all diversity of humans'. It is a shout for survival, the very survival of those of us who are non-white, non-male, non-able-bodied, and so on. It is also a shout for survival for us all as a species and for the survival of our planet as many environmental and human rights activists around the world continue to advocate (Álvarez & Coolsaet, 2020; Trisos et al., 2021). Decolonising is not about refuting Western knowledge, it is about contesting its hegemony and resisting this hegemony that has brought the modern world to a point of imminent danger, with deep economic and social divides, mass migrations, global warming, and the predicted catastrophes these can bring. At its most fundamental level, decoloniality wishes to ethnicise Europe and the northern hemisphere. The world of music gives a loud example of the importance of recognising European ethnicity as what it is, it is one group of ethnicities, and this realisation then validates other forms of knowing in the world.

7. DESIGN STORY: WORLD MUSIC

In the conservatoires of the world, we find many examples that illustrate how decolonial thinking can question the dominance of Western thought as a universal truth applicable everywhere as the superior form of knowledge. The forms of art that are valued as 'Fine Arts' exemplify the assumed superiority of Western culture. Fine Arts and classical music are admired in museums and concert halls, taught in art schools and conservatoires as the highest form of human arts around the world. In music conservatories, the musical expressions traditionally taught are those of Western European classical music (generally from dead white male European composers). The admiration of classical symphonic and operatic music as a superior form of music exposes the power structures that perpetuate Western modes of thinking in art. Forms of music that arise from the Global South are classified as 'World Music', folk, or ethnic music, as if European classical music had no ethnicity, and as if it were universal and neutral (Caizley, 2020). Even in the Global North, forms of music that do not comply with the classical music norms are labelled as folk music or pop music, and seen as less worthy. Yes, these borders are getting more diffused, but the prevailing classifications are still recognisable by all. But isn't all music World Music? Universal descriptive classifications are in fact judgements representing specific value positions. Is not Mozart earthbound and geographically located in a historical period and in a particular ethnic culture? Categorising the European classics as ethnic music sounds odd to our ears, which is a telling sign of the cultural notions of ethnicity of our upbringing. Now, in Puerto Rico, decolonising music at

the conservatoire is being enacted by changing the way music is taught by reconciliation, affirming all good music, and dismissing the idea of best music (Ingle, 2016). As Tlostanova and Mignolo explain:

> [T]here is an unconscious tendency to think that theories that originate in the Third World (or among Black or gay intellectuals) are valid only for the Third World (or Black and gay people), while theories that originate in the First World (and created by White and heterosexual people) have a global if not universal validity. This modern and imperial way of thinking is coming to its end. But we know that the belief that the Whites have knowledge and the Indians have wisdom; the Blacks have experience and the Whites have philosophy; the Third World has culture and the First World has science unfortunately is still well and alive. And what we say is that it is time to start learning to unlearn this assumption among others in order to relearn (2012: 3).

So, how to untangle the knots of our upbringings, to grow in awareness of our colonialised mentality, to become aware of our own biases in the designs we inhabit in our educational and/or professional lives? What we, the authors, are learning and wish to share, is to question, to critically reflect, and to observe how coloniality is present in our daily lives. We wish to focus not on solution-oriented processes nor objectives when designing a curriculum or an algorithm, but rather to focus on unravelling our power positions in these designs, untangling the meanings of a design in the context of the people who will live it, and co-designing with those who will use it. We believe that it is imperative that designers in all professions engage seriously, responsibly, and respectfully with issues affecting people and nature.

DIALOGUE BOX 3: YOUR MUSIC

Explore your musical preferences and what they say about your values.
Thinking of the music example in the text, can you engage in a conversation with a fellow designer, friend, or learner or with yourself about your musical preferences:
What do you listen to everyday?
What variety of genres do you engage with?
How has your family's music history and/or your friend's musical tastes impact your preferences?
How are your preferences influenced by the algorithms of the music apps you use?
The questions are not about what music you prefer but rather how your life history and your experiences and the culture you have grown up in shaped your musical tastes and your musical values. How aware are you of these processes in your musical preferences?

8. IS KNOWLEDGE EVER NEUTRAL?

If we only pursue a type of knowledge based on what can be calculated, we will be turning a blind eye to human reality (Morin, 2007).

The critique posed in the previous section is particularly disturbing for the natural sciences, as the Western model of knowledge production has the pretence of discovering 'neutral', 'universal', 'objective' truths or facts, as if they were not rooted in a certain culture or frame. If we, as practitioners, trained and formed by this mode of thought, are to question the dominance of Western knowledge, it is worthwhile asking ourselves the question of how this particular form of knowledge constructs and constrains our understanding of the world. Arturo Escobar points out that Western paradigms tend to create knowledge by separating things, labelling them, and subsequently categorising them (Escobar, 2018). There is a vast academic critical literature on these deeply philosophical issues of how knowledge is produced. We would like to touch on three issues that we feel are relevant for decoloniality. These are: thinking through differences, confusing ontology and epistemology, and reductionism versus holism.

Thinking through differences is embedded in European ontology (Luhmann, 1996; Niels Lehmann, 2004) as an essential aspect of understanding our world (Deacon, 2013); where the elements of the differences are labelled in a certain way. Differentiation almost inevitably tends to assign certain values to the labels and categories, and with it, ideas on what is 'better' and what is 'worse'. For instance, deaf people can be distinguished from hearing people, and this difference has in the past been used as a 'reason' to categorise them as dumb, and to disable them, placing barriers to their participation in society. The difference between hearing and deaf thus results in a value judgement of deafness, and of deaf people as being defective. The world over, deaf communities have been opposing this, and consider themselves as a specific culture with a specific linguistic identity (Woll & Ladd, 2011).

The labels and categories we create are often considered as real, neutral, and objective, although created unconsciously with values. They are presumed as real entities and used within the scientific method as if they were real categories. A pervasive example are the ideals and values classically associated with White, Western able-bodied males as representing the ideal health and body proportions of humans. These ideal proportions are considered to be 'real' in the most literal sense of the word. The scientific method justified the colonial agenda of White Western superiority well into the 20th century, and the consequences of this colonial thinking are still very much present today.

9. CONFUSING ONTOLOGY AND EPISTEMOLOGY

The notion of objectivity in science can be criticised as often confusing epistemological and ontological concepts (Atlan, 1993). A label or category can be a useful epistemological construct to organise scientific observations, but that doesn't mean it is an objective reality. The epistemological construct becomes part of the beliefs we hold about reality: our ontology. If, however, one then projects these labels and categories onto entities and beings, and considers them to be real characteristics of the observed, then these labels and categories can subjugate entities and beings. In other words, the description of a phenomenon becomes the way that the phenomenon is considered to 'really' be. This may need to be explored a bit further, and in order to do so, we borrow a very useful distinction from complexity thinker Edgar Morin, the distinction between the 'knower' and the 'known'.

Morin considers Western science to be blind to its role in organising knowledge (Morin, 2008). Its pretence of objectivity, and its purported neutrality puts the observer (the knower) in a weird place, when justifying the outcomes of scientific inquiry. First, the knower is awarded for being the 'discoverer' of the known, but once the knowledge that has been attained is shared with the scientific community, he or she is removed from the equation. The knowledge, which now has become a 'real' part of the known, becomes the defining identity of the known with potential powerful consequences, which are not always benign. For instance, the manner of labelling and categorising different ways of being human depicted in the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2017), which is the worldwide standard for psychological conditions, has met severe resistance from 'patients', and some mental health care professionals. Labels such as 'autism', 'depression', 'ADHD', or 'schizophrenia' are used to medicalise people's identities. People and children become disabled by these socially accepted categories (Dehue, 2010; Finkelstein et al., 1993; Hornstein, 2009; Oliver & Barnes, 2012). As a result, people who are labelled and categorised this way experience a society that dehumanises them, silences them, disables them, and denies them their human rights.

DIALOGUE BOX 4: FIND THE KNOWER IN THE KNOWN

Explore yourself as a 'Knower'.
With a partner or small group, choose a certain artefact, and then each one of you chooses one lens and takes turns talking about how you might see or think about the artifact through that lens. Think about how you see the world through your lenses. These could be related to your:
Role in your family
Race
Dis/ability
Culture
Ethnicity
Gender
Sexuality
Anything else about you

10. REDUCTIONISM VERSUS HOLISM

Another characteristic of the way Western thought organises its knowledge, is by splitting up 'wholes' into 'parts'. The rationale behind this is to understand the 'whole' by looking at the 'parts'. But by doing so, the organisation of the 'whole' is usually broken (Atlan, 1993; Deacon, 2013; Schön, 1984). This manner of organising is often called reductionism, and the implicit assumption behind it is that the known can be likened to a puzzle, where the different pieces can be put back together to recreate the original. Most forms of organisations cannot be put back together that simply, and an organisation gets lost when it is split up, most notably under the influence of entropy. 'You cannot unbreak an egg', in the terms of the physicist Brian Greene (2005). Reductionism also forces the knower to make certain assumptions as to which parts are important, and which parts are not relevant (the 'details'). By doing so, certain norms and values are imported, and hence invalidating the 'neutrality' or 'objectivity' of this mode of scientific inquiry.

Reductionism in all its facets has a long tradition of critique within the scientific community itself, and many solutions and alternatives have been proposed. The logical counterpart, holism, gained some traction after the 1970s, when James Love-

lock wrote his seminal book The Ages of Gaia (1988). Holism tries to understand the known in all its facets, without breaking up the organisation. However, one quickly runs into the problem of scope; where do knowers draw the boundaries? and is their training sufficient to cover all aspects of the whole? As a result, knowledge production always takes place between these two extremes. On the one hand, reductionism runs the risk of 'knowing everything about nothing', while holism may result in 'knowing nothing about everything' (Morin, 2006; 2008). For the purposes of this text, it is important to realise that, either way, the limitations of getting to know 'something' already gets in the way of creating 'objective, universal knowledge', and the labels and categorisations that are used are only epistemological constructs, and never characteristics of reality.

11. ABSENCES: PEDAGOGY AND DESIGN FOR THE SILENCED

Morin's concepts of the knower and the known in complex thought come to the heart of some of the questioning of the objectivity and neutrality of Western sciences. The knower is absent in the theories. The scientist or designer is named, exalted, and celebrated, but their identity is not considered an essential part of the study of their contributions to knowledge, maybe at best only as a historical fact. Decoloniality poses further absences such as the absentees in the knowledge production of the West: workers, women, the disabled, the Queer, those from Global South, the enslaved, or 'other' cultures, etc. Referring to the absence of knowledge from the geographies outside of the borders of the West, de Sousa Santos (2007) and Fanon (2008) used the term 'the zones of non-being' to describe geographies of the world whose populations are dehumanised in multiple ways in the intersectionalities of their beings (Grosfoguel, 2011). So much knowledge and experience are lost because they occur in the peripheries, the borders, of the rationalistic West and are discredited as forms of knowledge. Meanwhile, the universalised knowledge of the West is the one under which we all operate, and that determines policies in international bodies, governments, seats of knowledge production such as universities. As de Sousa Santos (2007) explains:

> So, what I am trying to do is a critique of the indolent and lazy rationality, that considers itself unique, exclusive and that is not exercised sufficiently to be able to see the inexhaustible richness of the world. I think that the world has a epistemological diversity that is inexhaustible, and that our categories are very reductionist (page 20).

Paulo Freire, one of the few pedagogical theorists from the Global South to be celebrated in the Global North, put respectful listening and learning with the students at the centre of his Pedagogy of the Oppressed (1970). Freire's Latin American lens had the overt political objective of democratising education. Freire used dialogue as the methodology of pedagogy and of educational research. Dialogue is the means to achieve *conscientização* – that is awareness of one's social reality, awakening critical thinking, and reflective encounters between people to create political awareness. His pedagogy and theoretical framework were developed teaching illiterate peasants to read and write through curricula and texts created with the learners and based on community dialogue. The mechanics of teaching literacy were similar to other methods but the materials and the inclusion of the learners in the learning project were radically different. Freire's impact on literacy pedagogy around the world cannot be overstated. He not only taught his students how to read and write, but his method of *conscientização* created possibilities for his students and millions more around the world to be active creators of their own lives (Walsh, 2014). Relationships became centre stage in the learning process, because *conscientização* happens within communities. The notions of social awareness within communities, of collective questioning, of participatory research became central tenets in Latin American thinking and shaped decolonial thinking.

The concept of decoloniality invites us to think more broadly, beyond the status quo, to acknowledge power structures, to question the 'grand masters', to become aware of our values, to work collectively, and to look outwards. Decoloniality suggests finding a plurality of paradigms in design practises, looking beyond the borders of the design field we inhabit. We have contended that design is value laden and hence political. The same can be said of education, which is after all a designed human endeavour. Decolonial thought invites us to think of a decolonial pedagogy in design where students, designers, teachers, practitioners all have a voice and listen to each other.

After your reflections in the dialogue box, we leave you with this quote from Freire's Pedagogy of the Oppressed:

> [T]he more radical the person is, the more fully he or she enters into reality so that, knowing it better, he or she can transform it. This individual is not afraid to confront, to listen, to see the world unveiled. This person is not afraid to meet the people or to enter into a dialogue with them. This person does not consider himself or herself the proprietor of history or of all people, or the liberator of the oppressed; but he or she does commit himself or herself, within history, to fight at their side (1970: Preface)

DIALOGUE BOX 5: YOUR EDUCATION

Thinking of your educational experiences from school and university.
Can you identify experiences of education as banking and others where you were part of the dialogue? Which have been more common in your experience?
What values have you been influenced by in your education?
Why might this question matter to you?
Why might it matter to people around me/you? [family, friends, city, nation]?
Why might it matter to the world?

11. CONCLUSION: OUR IDENTITIES AS DESIGNERS OF THE WORLD

This chapter is not a comprehensive introduction to decolonial thinking, but an invitation to unlearn, to question, and to reflect on our own personal and social intellectual positions and our design stories. As authors, we have many questions left and we have throughout the chapter attempted to frame dialogue boxes to engage with you in this text, to share our reflexivity, self-awareness and the rich complexity of what it is to create with others.

There are so many possible collaborations to participate in and with collectives from around the world that we have not even touched upon here. Decoloniality asks us to take a systemic look into design as a human endeavour and reframe for a pluriverse knowledge of possibilities, this cannot happen in isolated pockets around the world. There is much to learn from and with the Global South and through critical alliances.

DIALOGUE BOX 6: DESIGNER IDENTITY

Think about a design you have recently worked on individually or in a group, use these questions to reflect on your values and your identity in this design work.

VALUES

What values does this design invite us to think about? (Values are kinds of things that people value – fairness, justice, safety, respect, traditions, a nation or group a person belongs to, capitalism, creativity, etc.)

Dig a little deeper into any of these questions: Are they your values? Others' values? Whose?

Does the work affirm or challenge your VALUES or raise puzzles about these values?

IDENTITIES

Who is this design speaking about? And who is this design trying to speak to? (Not necessarily the same people!)

Dig a little deeper into these questions: Is anyone left out of the story that should be in it? How do you fit in or not fit in this story? Why?

Adapted from: http://pz.harvard.edu/sites/default/files/Values%20Identities%20Actions_0.pdf

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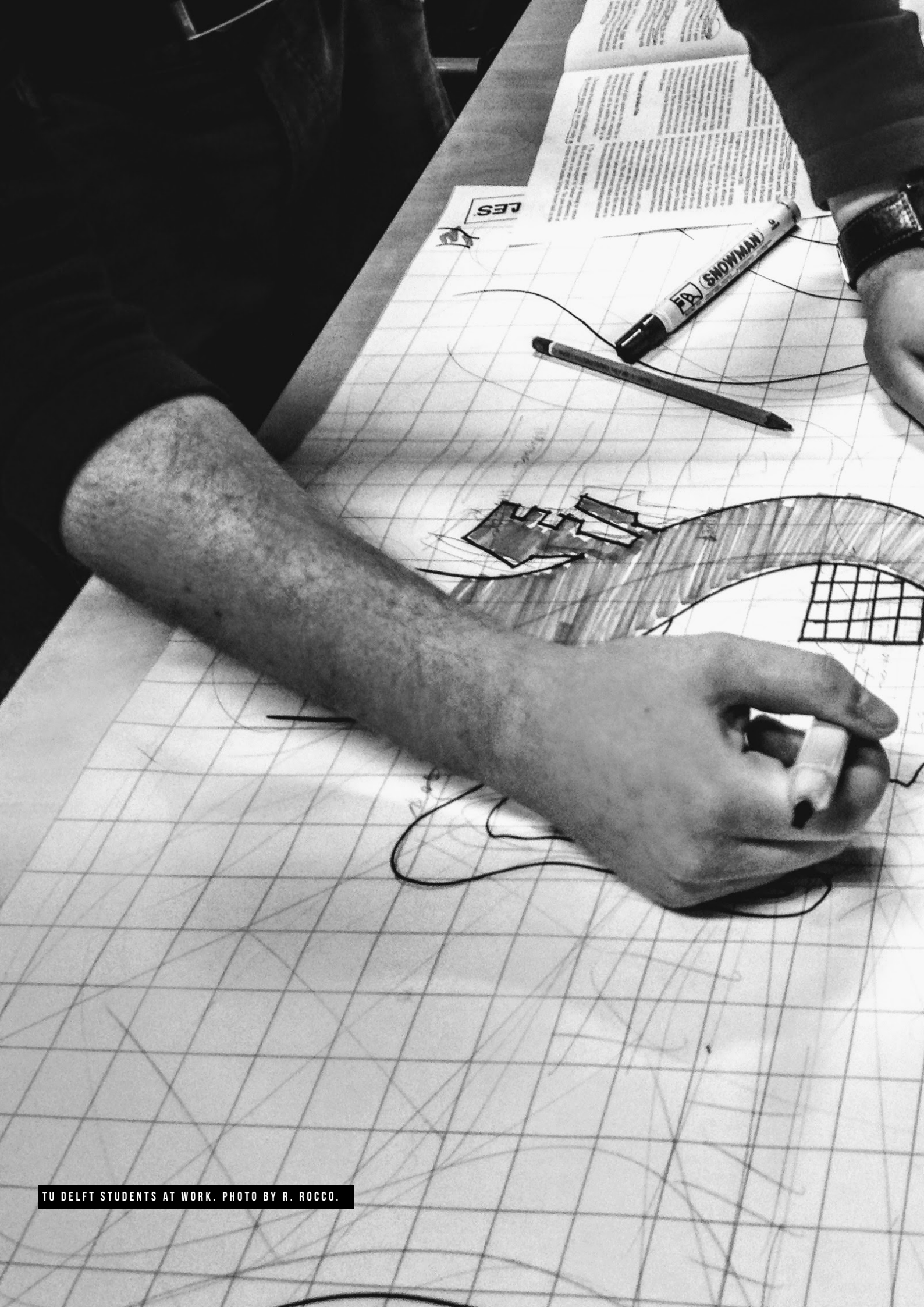
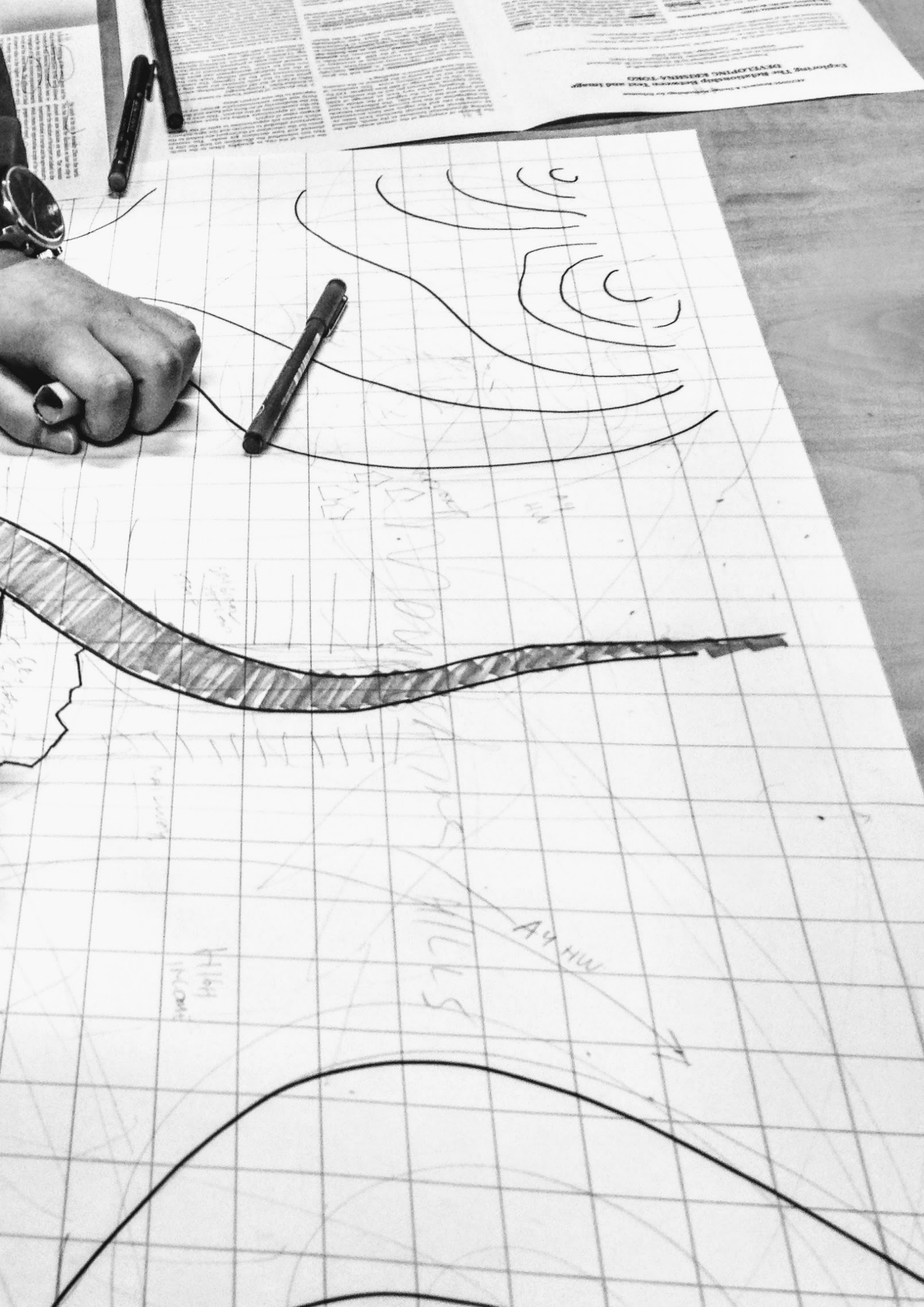


TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.



DESIGN FOR VALUES FOR ARTIFICIAL INTELLIGENCE

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ABSTRACT

Teaching design for values for artificial intelligence (AI) has attained certain urgency, with reports of algorithms that spread conspiracy theories, perpetuate biases on gender, and stigmatise people of colour. The ethical discussions regarding this technology tend to be philosophical or sociological, and only rarely manage to inspire those who are actually shaping this technology.

This contribution aims to explore some ethical questions regarding the design of AI. It is suggested that, rather than autonomous behaviour, the transition from classical machines can be found in the enormous capabilities of AI to process and classify labels and categories. These are externally provided by human users, and therefore give a superficial idea of human-like intelligence. The resulting expose on the man-machine divide may offer a more sobering account on the promises, risks, and threats of AI than the hype often suggest.

ARTIFICIAL INTELLIGENCE, COMPLEXITY THINKING, MAN-MACHINE DIVIDE, DESIGN FOR AI, PATTERNS

1. INTRODUCTION

Of all the innovative technologies that emerged in the 20th Century, Artificial Intelligence (AI) tends to capture the imagination the most. In part, this is due to the fact that AI is intimately related to robots, the most human-like manifestation of a machine. Obviously, the robot is more than AI alone, and many of the efforts to make it look human lie in innovations in mechanical and chemical engineering. However, since academic thought in the West tends to place the seat of 'self' in the human brain (Descartes, 1999) and as AI is strongly associated with the 'machine brain', the developments in this field have traditionally been riddled with philosophical reflection and concerns about its impact on our humanity (Simon, 1996). Even though critical thought about the values related to AI is very similar to that about technological innovation in general (Arthur, 2009), there are some issues that are most strongly associated with AI. These common issues predominantly concern the distinction between 'human' and 'machine', particularly because the robot promises to blur this distinction. This contribution seeks to address the challenge of designing for and with AI and to explore how values not only shape the designs of the artefacts that are made with AI, but also how values are processed by these artefacts and how this influences the world we live in (Pieters, 2021).

2. TALKING ABOUT AI

> ***I've seen things you people wouldn't believe. Attack ships on fire off the shoulder of Orion. I watched C-beams glitter in the dark near the Tannhäuser Gate. All those moments will be lost in time, like tears in rain. Time to die.***
>
> Roy Batty in Blade Runner (1987).

It may come as a surprise to the reader that research in artificial intelligence is almost as old as the computer, and therefore has a track record that is much older than the hype often suggests (Hassoun, 1995; Rosenblatt, 1958). Already in the 1950s, academics started modelling neural networks, abstract representations of human brain cells, and early academic publications included the findings of this research. It wasn't surprising that these developments caught the attention of philosophers and writers, particularly of science fiction, and provided a platform to critically reflect on the implications of AI, both in literature or in the (then) upcoming new media of television. Of course, literary interest in the human-machine is much older, and has its origins in zombies, golems (Deacon, 2013), and Mary Shelley's monster Frank-

enstein (Shelley, 2013). The word 'robot' (Czech for 'forced labour') was first coined as early as 1920 by Czech playwright Karel Čapek. The cyborg, a mixture of human and machine, was first mentioned by the American scientist Manfred Clynes in 1960 (Clynes & Kline, 1960), and has become an archetypical presence in science fiction today, as presented in pieces of fiction like Robocop or The Terminator. In fact, science fiction authors such as Isaac Asimov and Philip K. Dick contributed to the first ethical thoughts on robotics, such as the 'three laws of robotics', that Asimov introduced in a short story as early as 1942 (Asimov, 2018).

It is not surprising therefore that AI, maybe more than any other field of technological innovation, has always held the interest of philosophy, and many of the early AI practitioners did not shy away from critical reflection on their field of expertise. In fact, if one takes any interest in AI, one cannot escape deep philosophical questions, such as 'what is intelligence?' or 'what is consciousness?'

Philosophical reflection, however, has some serious drawbacks when dealing with technological innovation, and critical reflection on AI is not exempt from such drawbacks. In general, philosophy tends to be very good at reflecting on what is, and far less effective on what is to come. As a result, critical reflection on innovation tends to lag behind actual developments. As an illustration, consider the public interest in blockchain, the technology behind bitcoins (Casino et al., 2018). This technology matured during the bank crisis in 2008, with technological roots that are decades older, but only started to gain public attention around 2014 (i.e., six years later). The graph below showing the frequency of Google searches on the term blockchain is indicative (https://trends.google.com/trends):

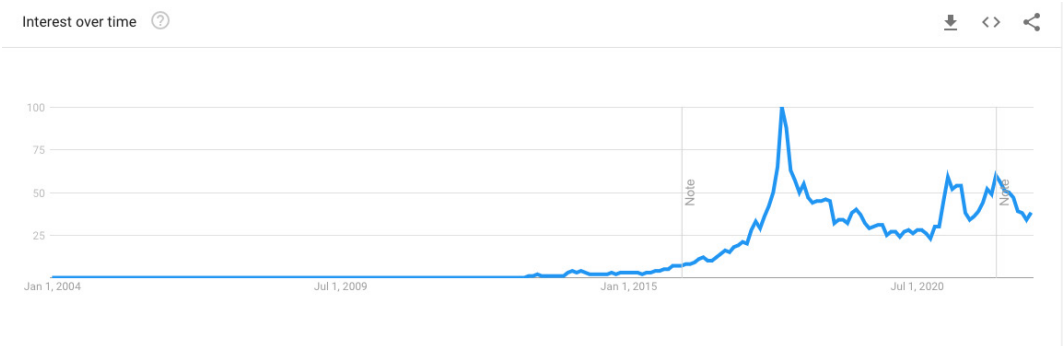

Figure 1: Google trends search for 'blockchain' from 2004 to August 2022. Source: https://trends.google.com/trends/explore?date=all&q=blockchain

The result of this lag is that critical reflection on new innovations is mainly left to the pioneers who are shaping the technology. These pioneers tend to be more interested in the opportunities and promises that innovation brings, and are far less focused on its dangers, risks, and side effects. Therefore, the early stages of innovation tend

to ‘techno-positivism’ between ‘consenting nerds’ (Troxler, 2015). The problems and challenges only become apparent when the technology has found its place in society, when it already has taken a more definitive shape (Jonas, 1985). Robert Oppenheimer’s infamous remark, after he witnessed the first blast of the atomic bomb he had helped to conceive and develop, reminds us of the consequences (Temperton, 2017): ‘Now I am become Death, the destroyer of worlds.’

As the account goes, his interpretation from the sacred Sanskrit text, the Bhagavad Gita, escaped from his lips as he witnessed ‘the radiance of a thousand suns burst at once in the sky’ unfold before him (Bhagavad Gita, Chapter 11, Schloka 12)

There have been a few attempts to develop intermediate languages that support critical reflection at the forefront of innovation, such as the ‘lingua democratica for genomics’ (Derkx, 2008) that was developed when biotechnology became a concern for the public and for policymakers (Derkx & Kunneman, 2013). This initiative aimed to develop languages that use concepts which are already common practice for technology innovators, such as patterns (Pieters, 2010a), but currently these initiatives still play a relatively marginal role in steering innovation.

The challenges of AI are closely related to those of technological innovation, but there are also some that are distinct, in particular because this technology takes place at the border between human and machine. Western thought especially tends to make a separation between ‘self’ and the body that contains the self, most famously expressed in the 16th century by René Descartes: ‘Cogito Ergo Sum’ or ‘I think, therefore I am’ (Descartes, 1999).

This statement already suggests that the ‘I’ can be fully determined by the ability to think, and that the body is little more than a container for the self. Even the neurological processes in the brain are not really relevant to understanding self-awareness or self-consciousness. One can draw a parallel with a similar divide between body and soul that is often expressed in religious thought, where the latter is trapped in the former, until death breaks the unwanted bond. In a way, the complexities of having, or being, an embodied ‘self’ are reasoned away, and are not considered to be important to understand the self. This also implies that a ‘thinking machine’ should be able to develop these characteristics, and eventually come to have a mind of its own.

It has been said that technology is neutral, in the sense that the presence or absence of technology does not have any ethical implications for humankind or the world we live in (Miller, 2021). Even if we would agree with this highly contested stance (Winner, 1980), technology still amplifies human ethical behaviour, and this would suggest that every step we take under guidance of technology takes place on an increasingly steep slope, and that the ‘goodness’ or ‘badness’ of even a small step becomes significant. Especially in discussions on AI, promises and threats are present in equal measure, at least in the public eye. The promises include a better, or easier life, where robots will take care of tedious tasks, and allow us to pursue our dreams

and passions (Winston & Edelbach, 2008). On the other hand, people are losing jobs through automation as we speak, and alarmists are even envisioning a future where self-aware robots wipe out humankind because there is no (longer) any use for us.

AIBO IN HEALTH CARE

One of the dilemmas that caught the public's attention around the turn of the millennium concerned an artificial pet called Aibo. This robot dog met severe criticism in some countries where it was given to elderly people as a companion (Tamura et al., 2004). Aibo did not suffer from a bad temper and did not require daily care, so it seemed the perfect pet for elderly people, especially those with dementia. Despite the positive responses from the owners, many people were concerned to find out that elderly people were offered this, in their view, poor replacement for real care, and believed that the elderly were better served with 'real' alternatives. When the experiment ended, however, few seemed to be interested to find out if these alternatives were actually implemented. At the time, it raised the question whether some prefer lonely people to have no company whatsoever, rather than that they are given the company of an artificial pet. In the end, research eventually did suggest that lonely people welcomed their artificial pets (Banks et. al., 2008).

Since Aibo, more initiatives have been taken to introduce artificial pets in health care, but generally these pets are still considered to be a poor replacement to human social interaction or real pets (Edwards & Beck, 2014).

What do you think?

3. THE HUMAN-MACHINE DIVIDE

Modern science and, with it, most of the technology that is developed today, is designed by mathematical formalisms which consist of long lines of cause and effect. This basically means that most machines can only do one thing, and choice is at best caused by conditions in the environment of that machine, such as an operator who is working with it. The 'intelligence' that these machines may superficially display is pre-programmed; the machine is not intelligent by itself, but merely carries out the 'intelligence' of its maker.

It is worth pointing out that this also applies for most computers. Even though the formal chains of cause and effect in computer programmes far exceed those of a traditional machine, and conditional statements are more elaborate, the computer still only performs tasks assigned to it, and therefore is not really autonomous (Wooldridge, 2000).

The distinctive difference of AI, as opposed to other technological innovations, is that it promises to give the machine a certain level of autonomy (Lane, 2014). The designer of the machine may provide certain constraints, boundary conditions, and even certain goals that the machine should pursue, but the machine is allowed to find its way on its own terms and achieve those goals on its own accord.

SOMETHING TO THINK ABOUT

If a machine is given certain autonomy, but the designer still provides the goals that the machine must pursue, can we really speak of 'autonomy' in a similar way that we humans describe our autonomy? How does this relate to a situation such as a workplace, when we give up certain aspects of our autonomy to pursue collective goals, such as defined by the roles we have in the organisation?

Currently, estimates of the level of autonomy of AI give it as comparable to that of insects, such as bees. Such measures should be considered with great caution, because we do not really know what concepts such as consciousness or autonomy really are, and whether the specific embodiment in a computer is comparable to that of an organism. For that reason, some researchers prefer to speak of 'computational intelligence', instead of AI, in order to respect the specific medium in which the intelligence resides (Tenne & Goh, 2010). AI then becomes a broader term, which could also include bio-technologically created organisms, or basically any intelligence present in media that are artificially created by humans.

Regardless of the philosophical implications, AI is made distinctive from other forms of technology by this promise of autonomy, even if only in a rudimentary sense. This has certain ramifications for the designers of autonomous technology. If a traditional machine can only carry out a programme that is determined by its maker, then it is clear that the ethical responsibilities of how the machine influences our living environment are also primarily a concern for the maker, or the organisation that takes the legal responsibility for the maker's work. If, however, a machine attains certain autonomy, and thus freedom to make its own decisions that the designer might not have foreseen in advance, then the ethical responsibilities start to shift between the designer and the machine. Considering the current state of AI autonomy, this issue is fairly comparable to similar discussions being waged on 'designer organisms', such as artificially created bacteria or viruses (Peng et al., 2014). Besides the ethical issues of traditional machines, the ethical responsibilities of the designers also include the question whether it is safe to introduce an artificial entity into the world, of which

the effects are uncertain or unknown. As the autonomy of the machine increases, this discussion will intensify, but it will not necessarily change. If, as a general guideline, ethics always implies the freedom to make a choice (Heiss, 1975), then the discussion on ethical responsibilities will also fan out over the various dimensions on which the machine can make autonomous choices. Take, for example, an autonomous car. If, for the sake of the argument, we assume that the car is able to make a great deal of autonomous choices as to the best route to take, the ethical responsibility we could assign to the car is still fairly limited, since the same type of choice is repeated in a lot of different situations and are all limited to choosing the best route amongst a set of alternatives.

Currently, the justification of this choice is usually pre-programmed by the designer, and is based on the shortest or most convenient route. If, however, the car can also make autonomous choices on why it decides to choose one route over another, then a new layer of choices presents itself, and shifts the ethical responsibilities a little bit towards the machine.

However, it could be argued that the car can only take up ethical responsibility if it is able to justify its choice to take one route over another. It should be able to 'know' which choices it can make, take a decision given the circumstances it has at its disposal, then reflect on the choice that is made, understand the possible outcome of alternative choices, and maybe in hindsight draw a different conclusion. Currently, there are no autonomous technologies that we know of which are able to make autonomous decisions at such a sophisticated level, and therefore we can conclude that with the current state of technology the ethical responsibility lies squarely with the designer of that technology. It also means that for the current state of AI, the issue of ethical responsibility is fairly comparable to other technologies with limited forms of autonomy, or that of organisms for that matter.

For instance, we do not hold other primates, or other intelligent creatures such as whales or elephants, accountable for their actions. If a wild animal harms humans, we usually respond to this by killing it. The justification for this is hardly based on ethical considerations, for instance, on the question whether the animal could know that its action was bad. This demonstrates that (our view on) the autonomy of animals is still considered to be such that we cannot speak of ethics. For similar reasons, the issue of accountability for AI is not likely to become topical for years to come.

SOMETHING TO THINK ABOUT

The interest of autonomous technology, such as self-driving cars or trucks, has legal implications for the designers of that technology. For instance, international maritime laws state that a human always has to be on board a vessel, and that person can be held accountable for possible accidents that may happen. With the current interest in autonomous shipping, human presence on board a vessel is being reduced, and possibly eliminated altogether in the future. This has certain precedents for the legal accountability of being on board a vessel and has led some members of the EU to state that the programmers of the software will be held accountable for accidents that can happen (Komianos, 2018; Mast et al., 2016; Pieters, 2015).

4. AI AND ITS MEDIA

In the previous section, the difference between computational intelligence and AI was briefly introduced. This distinction is related to the specific medium in which the 'intelligence' is situated. Although computational intelligence draws a significant amount of attention, artificially manufactured biological and biochemical AI is likely to claim increasing attention in the coming years.

A similar distinction can be made between artificial and 'real' or 'natural' intelligence, but with a precautionary remark that such distinctions are epistemological constructs and not necessarily ontological truths. With developments in artificial biological intelligence, we can already envision a blurring of these distinctions, which also applies to the distinction between computational and 'real' intelligence. Here we can see two developments, which are currently already taking place:

1. The Cyborg: in this scenario the human body is augmented with technology, and AI becomes part of the human presence
2. The Borg: in this scenario, borrowed from Star Trek, the human individual becomes part of a technologically organised collective. AI determines the choices of the collective, and biological organisms are its vessels.

Both scenarios are currently becoming manifest, and the challenges related to both forms of organisation are getting public attention. The Cyborg scenario relates to our increasing interconnectedness with mobile devices, wearables, and medical devices, especially implants such as pacemakers and insulin pumps. The foundations of these developments are decades old, but currently these devices are becoming

increasingly 'smart', and an increasing number of human functions are being monitored, and the data produced sent to central servers for further processing (Smith & Smith, 2021). This already raises concerns for privacy and security, but the likely next step brings these concerns to a next level, namely when these devices not only monitor bodily functions, but also control them. In this case, the question of why we should need these devices becomes urgent. In fact, we have millennia of evidence that shows we can live without them! Every bit of autonomy that we delegate to smart devices implies an increasing dependency on smart technology, and through this, also increased dependency on the companies that control the data that flows to and from these smart devices.

SOMETHING TO THINK ABOUT

Philosopher Mark Coeckelbergh discusses four potential objections to introducing AI assistive technologies in health care practices as replacements of human care:

> *First, a robot is able to deliver care, but it will never really care about the human. Second, AI cannot provide 'good care', as true care requires empathetic contact with humans. Thirdly, AI may be able to provide care, but in doing so violates the principle of privacy, 'which is why they should be banned'. Finally, AI technologies such as robots provide 'fake care' and are likely to 'fool' people by making them believe that they are receiving genuine care (2010).*

These objections can be considered very anthropocentric. Obviously, most objections also can apply for human caregivers, so why raise the bar to the highest level for this technology?
One can see these differences in expectations between human and machine in many discussions on AI. For instance, it is accepted that people cause accidents when driving cars, but an autonomous vehicle, such as Tesla, gets worldwide attention when it causes even a relatively minor accident. Why do we expect technology to be flawless, and are we so forgiving to our own shortcomings?

What is your take on this topic?

The 'why?' question is closely associated with the Borg scenario. Humans are social creatures, and every discussion on autonomy or freedom of choice is constrained by our need to belong to a certain social constellation. Governments, religious organisations and, more recently, marketing have been very effective in tapping into this need in order to create artificial desires that serve a certain purpose. In recent years,

developments in gamification have introduced new means to influence behaviour (Lay et al., 2021). Gamification tries to stimulate the reward centres in our brain, in order to create an addiction to the technology that we engage with, with the result that it becomes very difficult to resist them.

The rewards can be many and range from the feeling of belonging to an elite group, to the promise of status and success, to something as simple as a virtual crown, diamond, or bonus points when a certain challenge has been met (Luce & Raiffa, 1989). Many large tech and game companies work with psychologists in their research and development teams, and create an uneven battle when trying to resist this development. Recently, AI has increasingly been used in these gamification efforts, and the effects can be seen in the use of personalised advertisements on websites.

An extremely topical manifestation of the effects of AI influencing our behaviour can be seen in discussions on the use of algorithms in social media. In this particular case, algorithms are used to predict which content is likely to appeal to a user, which is then offered for viewing. If the user takes the bait, the algorithm 'knows' it made a correct choice, and then starts feeding the user more similar content. In itself, this seems like a reasonable strategy, because users get what they want most. However, this also means that users are increasingly exposed to more of the same information, creating information bubbles where like-minded people are continuously having their standpoints and beliefs reaffirmed, while contradicting ideas are filtered out, and those who express them can even become subject to demonisation.

Additionally, most people tend to favour very distinct and outspoken ideas, rather than nuanced ones. Over time, this leads to people becoming trapped in epistemological bubbles of increasingly outrageous ideas (Bozdag, 2013; Bakshy et. al., 2015).

The resulting self-reinforcing feedback loop, or the pattern of 'convergence-inducing process' (Pieters, 2010a), has recently been associated with the increasing popularity of conspiracy theories on the Internet, and even with influencing elections by foreign powers. This means that AI has become a potent instrument of propaganda and warfare, and a threat for democratic processes in the world (Lewandowsky et al., 2020). AI therefore has become a major influence in shaping society and the world we live in, which makes philosopher Luciano Floridi believe that we are currently witnessing a metaphysical shift, a 'fourth revolution' after Copernicus, Darwin, and Freud, that forces us to rethink our human rights in this day and age (Floridi, 2014).

The pattern of convergence-inducing processes has been identified in pattern recognition software, which is often used in cameras, and which has proven to have strong biases towards race and gender (D'Ignazio & Klein, 2020). Contemporary technology in AI needs to be trained with certain data in order to make distinctions between various categories, such as 'male' and 'female', 'adolescent' and 'elderly', 'Caucasian' and 'Asian', etc. If the training sets of the algorithms are mainly based on the input of young, white university students, the algorithm has too little input to

discern between other categories that are present in the real world, and will start to make mistakes. This can have serious consequences when this software is being used, for instance, with facial recognition software in surveillance cameras, and may lead to incorrect identification of people. Miriam Vogel, the CEO of EqualAI, explains in a blog post how this self-reinforcing pattern of feedback works:

> As we have learned, law enforcement activities such as predictive policing have too often targeted communities of colour, resulting in a disproportionate number of arrests of persons of colour. These arrests are then logged into the system and become data points, which are aggregated into larger data sets and, in recent years, have been used to create AI systems. This process creates a feedback loop where predictive policing algorithms lead law enforcement to patrol and thus observe crime only in neighbourhoods they patrol, influencing the data and thus future recommendations. Likewise, arrests made during the current protests will result in data points in future data sets that will be used to build AI systems (2020: 1).

The obvious solution, namely to diversify the training sets, is also problematic, because then the software has growing problems creating distinctions between what it perceives as almost equal data sets. Although the software is becoming increasingly sophisticated, it still means that the ultimate training set for these applications should contain data of every individual in the world, during different phases in their lifetimes, under different personal circumstances. And this data poses serious threats to individual privacy.

Earlier, the current developments in AI were compared to the ideal of 'autonomous machines', and it was argued that progress was yet not really significant enough to warrant serious ethical debate. The real impact of AI lies, in fact, in the ability to learn and to classify an enormous number of categories and labels, and to increasingly recognise distinct features between these classifications. This is something that a traditional machine could never achieve. However, it is important to realise that these classifications are always presented to the AI externally, by design! As Miriam Vogel points out, understanding the norms and values that are inherently associated with these classifications is a vital responsibility for the designers and users of AI, and should get serious attention in their education.

It is worth pointing out that even though AI is becoming an increasingly sophisticated instrument of classification, the self-reinforcing feedback loops between humans and the algorithms are not very complicated, and can be conveyed quite easily. This changes when the collective becomes more intelligent than its constituents, and the collective becomes the organising principle, rather than the individual elements. In this scenario, AI might become the prime decision-maker, and the individual elements of the collective may be deemed less important, or replacea-

ble, with regard to the goals of the collective. This could include the human constituents of that collective. It is worth pointing out that this scenario, like all the other scenarios that have been discussed so far, has equivalents that are currently topical, or else has historical precedents. In this case, we can see similar ethical discussions arise when a country sends young, able-bodied people to war. The ethical justification is often that the individual sacrifice is needed to save the collective (the nation, the group, etc.). In the case of the Borg scenario, it is interesting to ponder whether humans would be willing or capable of pledging that sort of allegiance to the collective when leadership has become non-human.

Another equivalent to the Borg scenario can be found in the neo-liberal ideology of the 'free market' (Friedman, 2005). Free market ideology can be distinguished from other forms of societal organisation, in the sense that it does not believe in a supernatural being, or a human representative or representation that takes the place of such a presence. These hierarchical structures, where a human with god-like capabilities resides at the 'top' of the hierarchy can be traced back to the dawn of agricultural societies, and in that sense is an organising principle that is at least 8000 years old (Christian, 2005). Neo-liberal capitalism, on the other hand, assumes that there is an organising principle at work that regulates supply and demand, the 'invisible hand' of Adam Smith, the 'Father of Economics' (A. Smith, 2003). According to the neo-liberal conceptions of his ideas, individuals act primarily in their self interest (rational choice theory) and by doing so, increase the likelihood of general prosperity. Government intervention can only cause 'market failure', and should be limited, so as to not hinder the 'naturally' well-functioning marketplace. Here, one can see an implicit belief, in which collective behaviour creates a form of artificial intelligence that supersedes human capabilities. Obviously, the other extreme, where one governing body is responsible for, and 'leads' all the complexities of society, is based on a belief that everything that can happen can be managed and overseen by that authority. Here the human mind is considered powerful enough to understand everything that might possibly happen, or at least those things that are considered to be relevant.

SOMETHING TO THINK ABOUT

Posthuman philosophy is one of the most extreme contemporary schools of thought on the cyborg scenario. Thinkers such as Donna Haraway (1991), Rosi Braidotti (2019), and N. Katherine Hayles (1999) suggest that with the blurring of the man-machine divide, but also between 'real' and virtual presences, the idea of humanity and in its wake, humanism, is allowing for new conceptions of a shared future, that is less anthropomorphic, and allows for the inclusion of non-human presences, who are still poorly represented in the humanist traditions. Rights of animals are an obvious candidate for these posthuman views, but their critique goes much deeper and questions the very nature of how we label and categorise other presences, and how these labels and categories are used in systemic power relationships. We can see a relationship with similar discussions on gender fluidity and identity politics, but posthumanists consider these debates just a step towards a posthuman future which allows for a wide range of fluid identities, which overlap with other identities, such as with other species and, evidently, with intelligent machines. Hayles, for instance, sees the 'human' as a historical construction that emerges from historically specific understandings of technology, culture and embodiment. This implies that our perception of what it is to be human changes when technology changes, and is not fixed in space and time. The robot, in this respect, is not only a simulacrum of humans, but it also alters our perception of what it is to be human.

What is your take on this topic?

5. DESIGNING FOR AI

The previous sections have given a rough historical sketch of developments in AI, and attempted to discern some patterns that have equivalents with other societal developments, and can be summarised in the following graph:

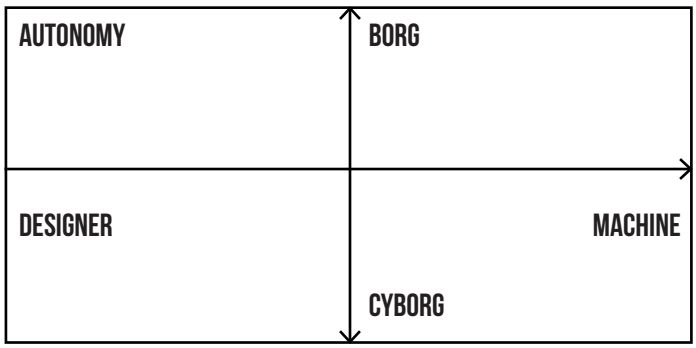

Figure 2: Ethical Plane of AI. Diagram by the author.

In this figure, the x-axis represents the shift from designer intelligence to machine autonomy, while the y-axis represents the Borg/Cyborg scenarios. Most developments that are related to the ethical discussions on AI can be placed somewhere on this plane. It is worth emphasising again, however, that AI is strongly connected with other technological innovations, and so developments in wearable devices, which can be positioned as designer oriented Cyborg technologies, take place at the same time as robots who are influencing public opinions in social media, which could be considered designer-oriented Borg technologies. The combination of these various innovations actually shape the future of robotics, and even though they cover a plane between Borg and Cyborg technologies, in the view of the author, it is hardly making any significant progress into machine autonomy as to warrant any meaningful ethical debate that is unique to AI. For the assessment of the ethical issues at the forefront of these innovations, it is sufficient to find viable contemporary or historical equivalents of debates that have already been waged. Sources of such debates for Borg technology are likely to be found in societal or sociological literature, those for Cyborg technology in medical literature, and those for machine autonomy in the ethical debates concerning animal rights.

In the light of the views depicted above, design for values for AI is by and large based on exploring the ethical accountability of the designer of this technology, and is an issue related to ethical debates in innovation in general. However, as most designers of AI have a background in the natural sciences, it is worth exploring some of the beliefs behind the natural sciences in greater detail, in order to expose the often-implicit beliefs behind certain epistemological or ontological constructs that shape the norms and values of designers, and which are coded in concepts such as 'truth' and 'objectivity'.

6. NORMS, VALUES, OBJECTIVITY, AND TRUTH

One of the complicating factors when exploring the values for design in AI is that the designers are predominantly trained in the natural sciences, and present themselves as being neutral with respect to values that are conveyed in the descriptions of subject matter (Atlan, 1993). The dominance of this belief system contributes to a sense that knowledge is 'universal', which basically means that it cannot be criticised, except for certain innate inconsistencies which eventually will be banished by scientific 'progress' through the scientific method. The grand goal of the natural sciences is to develop a unified body of knowledge about our universe and our life-world that is internally consistent (preferably 'exact') and complete. There has been a wealth of criticism within and from outside the sciences about the feasibility of these goals and

aims, but for the purposes of this chapter it is important to realise that the beliefs of 'technological rationality', as this system of beliefs is often called (Schön, 1984), are part of the cultural training of designers of AI, and provide the justifications of the activities they pursue. Amongst others, these beliefs include the following:

> 1. Neutrality: the knowledge is true regardless of the beliefs and opinions of people, including the discoverer
> 2. Objectivity: the knowledge provides accurate descriptions of subject matter. The things that are described are considered to be part of subject matter, or the 'object'
> 3. Universality: knowledge, if proven to be true, can be applied to similar phenomena discovered anywhere in our known universe

As the artefacts that are designed by AI enthusiasts are considered to 'contain' these beliefs in themselves, it follows that the artefacts of AI, or any other technological innovation, are themselves value neutral, objectively 'true', and universally applicable.

It can be argued that, if technological rationality purports to create knowledge about our lifeworld that is neutral, then it must exclude descriptions of agents whose actions are determined, in large or in part, by certain values, such as is the case with human beings. We have seen earlier that AI can, and usually does, contain certain values which are usually defined by their goal-directed behaviour, but in this regard, human actions currently by far exceed the best that AI currently has to offer. And this also applies to the designers of AI!

As a result, technological innovation often produces narratives where there is not a clear distinction between how and why they are, or need to be, made. The descriptions of an artefact's operation are usually predominantly expressed in the objective, neutral language of mathematical formalism, but the justification of the design activities often maintains the pretence of being equally neutral, objective, and universal, when in reality it is not (Mitcham, 1994). Scientific or technological 'progress' is then perceived as holding a universally applicable, objective 'truth' that does not need to be defended, and certainly does not call for critical reflection. Technology then runs a severe risk of becoming ideology, where the promises of the innovation are exalted, and the risks are ignored (Jonas, 1985).

When 'teaching for values' (van den Hoven et al., 2015), it is of utmost importance for students to realise that norms and values by their very nature never meet the standards of neutrality, objectivity, and universality, even though some of these may, by societal and cultural coding, seem so obvious that they may appear as being so. Especially in the popularisation of science, there is a risk of presenting norms and values as fact, which is particularly present in research that aims to 'enhance'

humans through technology (Grey & Rae, 2008; Kurzweil, 2006; Vizcarrondo, 2014). The rhetoric here tends to assume as fact that so-called human shortcomings need to be 'fixed', despite the wealth of literature in the social sciences and the humanities which demonstrates that illness and dis/ability are also socially constructed and historically situated (Dehue, 2010; Hornstein, 2009). Educational values for design therefore must introduce students to these views, especially in AI, where the human-machine divide is extremely value-laden, but also where naive conceptions of human traits or alleged shortcomings may result in technological designs that are poor simulacrums of certain human aspects.

In some areas of science, the nature of objectivity is being criticised, and the purported neutrality of the natural sciences is being questioned. One specific area of critique, called complexity thinking, or 'complex thought', tries to move beyond critique, and explores ways to marry the unmistakable strengths of science, engineering, and their derivatives with the critiques that have been identified (Cilliers, 1998). Thinkers such as Edgar Morin have demonstrated that the objectifying view of science tends to omit the role of the observer (e.g., the scientist or the designer) in the knowledge acquisition process (Morin, 2008). The observer derives certain knowledge from that which is observed, and this is then projected back onto the observed as if this knowledge is really represented in the subject matter. Subsequently, the observer is removed from the equation, and is only revered as being the 'discoverer' of that knowledge, after which anyone can describe the object in the terms that were shared.

With Morin's focus on both the observer as the observed or, in his terms, the 'knower and the known', knowledge becomes a relationship between both parties concerned, which allows this relationship to become more of a mutual agreement (or dialectic) rather than something that is imposed on 'the known' (Sennett, 2009). In many ways, these views resonate with the critiques of science that have been raised in, for instance, gender studies since the 1970s and 1980s (Haraway, 1988). However, Morin specifically aims to move beyond critique and transform such 'situated knowledges' into methodological constructs that can enrich research in the natural sciences.

For the purposes here, this view allows us to consider designed artefacts in relation to the world with which they are engaged. The narrative that describes the design and function of the artefact can still be described in the manner of technological rationality, but the manner in which both designer and artefact engage with their lifeworld can be described within a different framework, such as one that includes norms and values. As a result, one could make distinctions between lateral and transversal ethics, where lateral ethics follows discussions on the making of the artefact, its purpose, or its function, while transversal ethics tries to explore the wider consequences of the engagement, the motivations of, and justifications offered by, the

designer, and the effect that the artefact will or may have in our world (Pieters, 2021).

Even this brief and necessarily somewhat superficial introduction to design for values for AI has one hidden gem for the keen student of these issues. From the previous argument, it may have become evident that current thought on AI crosses academic domains, from hardcore mathematics to the social sciences and humanities, if only because of the idea that the robot might be or become a simulacrum of humans. The prevailing tendency of Academia towards specialisations prevents us from understanding processes and patterns that are not affected by the epistemological boundaries that are drawn by these specialisations (Morin, 2008; Schön, 1984). Even more so, the inevitable biases created by specialisations make it difficult to appreciate the arguments for admitting the contributions from other sources of knowledge, and lead to critiques that do not reach their intended audiences.

The complexity-informed approach proposed here for Design for Values in AI borrows insights from many domains, from hardcore tech to postmodern philosophy. This may offer an inclusive lens to understand these patterns and processes. We invite students to be inspired by the alien worlds of other disciplines, where thoughts are expressed that may initially be confusing and frightening but with patience and openness may become an inspiration for further research.

In my view, education for the Design for Values in AI should cater for students who take pleasure in such exercises across scientific domains, and who manage to negotiate the skills of expertise in one area with the curiosity to engage with other areas as enthusiastic amateurs.

7. CONCLUSION

This contribution has explored the issue of designing for values in AI, using elements of an intermediate language, a *lingua democratica*, that tries to stay close to the background and training of designers of artificial intelligence, but at the same time invites them to engage in critical reflection on their practices, and the artefacts they design. Particularly for AI, the difference between designer and artefact promises to become less clear as artefacts are designed to be(come) human-like, and this means that the culture and training of the designers of AI in the natural sciences will find intersections with methodologies and philosophies that are more commonly found in the social sciences and the humanities.

This particular exercise has used elements of reductionism to create distinctions between designer and design, man and machine, Borg and Cyborg, objectivity and normativity, and to explore the ethical dimensions of AI in a manner that is not uncommon in the natural sciences and technology education. An attempt has

been made to find contemporary or historical patterns that are fairly comparable, and which may inspire designers to deepen their understanding of the ethical consequences of the products they make. We have also argued that the ethical reflection that is truly characteristic of AI is likely to be limited, owing to the limited autonomy of current technological artefacts.

As this puts the ethical accountability squarely in the realm of the designers of those artefacts, it is of utmost importance to stimulate the means of ethical reflection in the early stages of the design process, when the artefacts are still being conceptualised, and so prevent the 'blindness' with regard to norms and values that objectifying science tends to have. For, most of all, Design for Values for AI presents us not only with the challenges of design, above all with our own perceptions of what it is to be human.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

DESIGNING FOR DIGITAL WELL-BEING: A NEW VISION FOR AN ETHICS OF ONLINE DESIGN

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ABSTRACT

This chapter offers a sketch of how teaching ethics for engineering students at higher education levels could be improved. Today, engineering students are invariably introduced to the so-called 'five-systems model'. This model presents them with different models of ethical evaluation (deontology, utilitarianism, virtue theory, care ethics, and the capability approach), showing how the application of different moral theories affects how we think about design dilemmas. Although introducing ethical discussion into the design education process is to be welcomed, the five-systems model is insufficient in its current form. Students often find it overly abstract and far removed from practical concerns, and there is also a danger it can precipitate relativism about values. This chapter provides the building blocks for a new approach by exploring how the notion of a moral exemplar can be used to give a concrete instantiation of values. Doing this allows students to grasp their own value systems and to share these with other designers in the educational environment.

DIGITAL WELL-BEING, EXEMPLARS, ENGINEERING ETHICS, FAME, CELEBRITY

1. INTRODUCTION

Over the last decade, online users have begun identifying a constellation of problems with the digital products and services that are offered by major tech corporations. Chronic distraction, screentime fatigue, overt political manipulation, and deception by pernicious algorithms have all contributed to a growing concern about the effects of prolonged immersion in the online space. Major tech companies have responded to these concerns by launching products that aim to help users utilise online services in ways that are more compatible with digital well-being (Brey, 2015; Burr & Floridi, 2020; Burr et al., 2020). Google launched its own digital well-being site in 2018, and most major social media companies did so shortly afterwards. By the same time, universities and research institutions began responding to public and political pressure to improve digital well-being by providing teaching in ethics and moral philosophy to students in computer science, engineering, and STS (Calvo & Peters, 2014; 2013). Although higher-education institutions in Europe have been ahead of this trend, some have bemoaned how slowly it has happened in the US, especially as this is where the major social-media platforms initially began and are now largely based. It was only in 2015 that Stanford launched a mandatory ethics module for the computer-science degree that a whole generation of tech titans graduated from in the late 1990s. MIT finally followed suit in 2018. The aim of these new courses is to encourage those who will go on to create the next generation of online products to design more ethically.

Nevertheless, despite long-overdue attempts to put ethical values in the driving seat when designing future online products, integrating ethics with corporate research culture typically encounters problems on multiple fronts. Not only are companies structured in a way that requires them to prioritise profit over ethical concerns, but there has also been kick-back from would-be future engineers themselves. Student engineers often complain that the ethical training they receive at under- and postgraduate level is otiose (if not actively inimical) to their ability to prosper in the entrepreneurial environment in which tech start-ups have to live and breathe. This can have the effect of creating two seemingly incompatible evaluative vocabularies, each of which we may imagine running through the mind of a programmer or an online engineer. On the one hand, the incubator and accelerator schemes in which many programmers participate urge them to boot-strap their way to profit, swiftly scale up, then seek acquisition by a wealthy competitor or go for an IPO. On the other hand, programmers are taught by educational institutions to constantly prioritise ethical concerns while seeking this kind of commercial success. These two competing concerns can create multiple conflicts of interest. Overcoming these conflicts requires us to find innovative ways to teach ethics, so that programmers will retain the insights of their ethical training throughout their working lives, long after they have left higher-education institutions.

The aim of this chapter is to sketch a way by which teaching ethics could be improved for programmers at higher education level. Today, programmers, designers, and other kinds of online engineers are typically introduced to the so-called 'five-systems model' (5-SM). This model presents them with several models of ethical evaluation (deontology, utilitarianism, virtue theory, care ethics, and the capability approach), as a way to show how applying different moral theories affects how we think about design dilemmas.

While this approach is clearly a valuable and a tried-and-tested way to broaden our ethical intuitions, many who teach such courses report that engineering students can still regard these systems (if not the entire mandatory course itself) with a mixture of boredom and hostility. In what follows I provide the building blocks for a new approach. By developing the ideas of 'ethical exemplars', I argue that engineering ethics for programmers do not have to be presented as systems of constraint on new and innovative design. Rather, many key ethical topics can be more effectively taught by encouraging students to identify positive examples of digital well-being from today's popular culture. We are naturally fascinated by the lives of celebrities, sports stars, political leaders, entrepreneurs, spiritual gurus, and religious teachers for many reasons, but one important reason is that these figures can use the online space to promote their own ethical perspectives. Putting a 21st-century conception of digital well-being at the centre of engineering ethics gives students a unique and powerful access point to the ethical considerations to which their designs should respond. After showing how future programmers can identify contemporary ethical exemplars, I sketch a process through which these students can evaluate existing products and services according to whether they actively promote (or are compatible with) their justified ethical ideals. By requiring online engineering students to identify and justify their choice of ethical exemplars, I show how they can improve their ability to design for human flourishing in a way that goes far beyond the schematised discussions of morality that all-too-often defines today's ethics seminars.

2. ETHICS EDUCATION IN ONLINE ENGINEERING TODAY

Today, ethics education for online engineers has many strands, varying across educational institutions, national boundaries, and cultures. In this section, I focus on what I refer to above as the 'five-systems model' (5-SM), which are typically prominent in Europe and North America. In fact, much online engineering (coding, programming, interface design, etc.) takes place in emerging economies, often those located in the Global South. Here programmers and online engineers receive varying degrees of formal ethics training. This rarely includes the 5-SM, which takes a predominantly Western perspective (Vallor, 2017; 2016). Many of these day-to-day programmers in the Global South have little or no formal education, or work freelance. As long as we

bear these caveats in mind, it is correct to say that the 5-SM continues to be deeply influential in mainstream ethics teaching in Anglophone countries (US, UK, Canada) and to a lesser extent in mainland Europe. So, what precisely is it? And how does it aim to inform the ethics education of today's online engineers?

At the heart of the 5-SM is the contention that future technological innovations can be ethically evaluated using a variety of perspectives. These perspectives offer insights into how decisions can be made in the design process. Let us take an example that has recently garnered heated attention. As mentioned above, since 2018 excessive screen time has become increasingly viewed as a threat to the digital well-being of users. Warnings about excessive screen time typically come from psychologists, as well as from lobbying groups such as the US-based Center for Humane Technology. Researchers such as Jean Twenge, for instance, have now become important voices in articulating the claim that excessive screen time is especially harmful for children and adolescents (Goodyear, 2018 et. al; Grau, 2019; Goh et al., 2019). While these claims have been disputed (Orben & Przybylski, 2019a; 2019b; Orben et al., 2019c), there is now a growing consensus that excessive screen time – especially when this time is spent on social media – has a wide variety of negative consequences for tech users. Understanding this danger using the 5-SM reveals there to be five correspondingly different ways to deal with screentime, with each way or 'system' shedding light on a different ethical aspect of the problem. For care ethics, for example, the primary concern is the welfare of the screen-users; for the capability approach, the key issue is what capabilities screens increase or inhibit; for utilitarianism it is a matter of balancing the costs and benefits of screen time, etc. So, what precisely do the five systems of the 5-SM look like?

The five approaches can be summarised in the following way:

2.1. DEONTOLOGY

Online technologies should be designed in accordance with the moral duties we have to ourselves and to each other. For example, regarding screen time, do we have a duty to ourselves or others to reduce our screentime, if excessive screen time impairs our ability to fulfil moral duties to ourselves and others?

2.2. UTILITARIANISM

Online technologies should be designed to maximise the amount of utility they produce. There will be costs to developing these technologies, but these costs can be mitigated by the benefits to the yield. For example, regarding screen time, what is the net benefit or deficit of screen time? How does screen time contribute to our overall digital well-being?

2.3. VIRTUE THEORY

Online technologies should be designed to be compatible with ethical character excellences, that is, moral virtues. These technologies affect our character, so we should design them so that they cultivate the character traits we most care about. For example, regarding screen time, does this impact positively or negatively on digital well-being? How might this work?

2.4. CARE ETHICS

Online technologies should be designed to foster our ability to care for one another. We should not design technologies that are harmful to our own ability to care for others or for ourselves. For example, if excessive screen time is harmful, what care issues does this raise for those in our custody, such as children and young people?

2.5. THE CAPABILITY APPROACH

Online technologies should be designed to maximise the exercise of our capabilities. Design choices that inhibit our ability to exercise our capabilities or limit these capabilities should be avoided. For example, regarding screen time, does screen time increase or decrease our capabilities to do something or for performing a specified task? What are the relevant ways this works?

Finally, it is important to note that each system can overlap in numerous ways. This should be expected insofar as ethical thought from different epochs and geographies still shares many commonalities. Nevertheless, the 5-SM works because there are often differences, which lead engineers to think about their designs from alternative points of view. First, applying one ethical system to the design of a technology sometimes points to a strikingly different design solution to the technology in question. This often happens in deontological approaches to the design of technology when they are compared to utilitarian ones. Adopting one approach can yield strikingly different results, which reflects how advocates of each of these ethical traditions can vehemently oppose each other on certain issues. Second, ethical systems can offer markedly different reasons for us to design a technology in precisely the same way. This gives rise to the kind of ethical overlapping mentioned above. Different ethical traditions can offer different reasons for the very same ethical action. In the case of screen time, explored in each of the approaches above, we saw that they offer markedly different reasons why excessive screen time is perilous, while agreeing that ethical design involves measures to reduce it.

3. CRITICISMS OF THE FIVE-SYSTEMS MODEL

Now I have explained what the 5-SM is, we are ready to explore its strengths and weaknesses. In what follows, I shall be as charitable as possible because generally the introduction of ethics for online engineers is vitally important, even if current incarnations of it could be improved upon. Prior to the 5-SM, designers had less ability to think through the ethical issues clearly, so the introduction of this model in Western education represents definite improvement. In short, the structure of the 5-SM has a mix of advantages and disadvantages, the most important of which I outline below.

Offering engineering students five different perspectives, palpably demonstrates that ethical design is a messy, complicated, and fiddly business, one that can rarely be resolved with a one-size-fits-all approach. This gives us strong reasons to think that different ethical problems need to be addressed using different ethical systems. Moreover, we should add that even when one has chosen the right system, then there is still a painstaking process of applying this system in the right way. Deciding that a deontological approach is best suited to regulate digital well-being, for example, says nothing on key questions pertaining to which duties? whose duties? and how to resolve conflicting duties? Given that 1) ethical problems in design are messy, and 2) these problems cannot all be approached with a single system, then 3) offering engineering ethics students five ways to tackle them is – to at least some degree – useful. Nevertheless, this advantage also harbours potential disadvantages, which are important to understand if we are to propose an alternative to the 5-SM.

The first concern we may have is connected to what philosophers discuss in debates about 'moral relativism'. By continually presenting students with five ethical systems, which result in distinctly different design decisions, these students may well be inclined to pick the system that is most ethically sympathetic to the product they are evaluating. Think back to the pressures on the design environment that we encountered above. The tech corporations for which many future programmers – as well as other kinds of employees – would like to work are often structured in a way that requires their employees to prioritise profit. This also applies to many intermediary institutions – accelerators, corporate-funded labs, etc. – that share this corporate structure. This requirement does not just apply at the point of hiring, but it permeates the entire corporate structure, and connects to pay, promotion, and other incentives. The motivational environment created by the technology corporations that digital engineering students will eventually work for provides these individuals with strong reasons to simply pick the ethical values that most accommodates their creations. Offering them five such systems increases the options for doing this, but most importantly increases the strength and prevalence of the idea that ethics is a highly subjective enterprise with multiple perspectives that can be chosen according to one's own point of view.

The second concern we may have relates to the potential skills that engineering students take away from the process. The purpose of ethics education courses that use this model is to improve the ethical sensibility of programmers. Upon starting jobs in which they will design new online technologies, we hope that a programmer who has a solid ethics education will have the ability to infuse their designs with ethical values, so that they contribute to building a better world, both for individual users of online technology and for society as a whole. Nevertheless, a discursive course in which students are required to debate the various perks of one system over another, primarily promotes their ethical reasoning, rather than their ethical sensibility. Ethical sensibility is closely connected to ethical reasoning, of course, although one's sensibility and one's reasoning about ethics are two different things. Those who are able to reason well ethically are likely to possess a more developed ethical sensibility. We can see this in the perception of ethical distinctions. Those who have strong powers of ethical reasoning have to make use of a wide variety of ethical distinctions, and these distinctions are an important part of seeing the nuance of ethical problems.

Nevertheless, ethical reasoning is not the same as having a well-developed ethical sensibility. It is perfectly possible to make ethical distinctions, but not to correctly apply them. In addition to this, how we apply ethics seems to be the most important thing. It may be that well developed ethical reasoners are likely to have a well-developed ethical sensibility, but it does not follow. As the tabloid press likes to document, many do not 'practice what they preach'. In the same vein, the 5-SM model teaches engineers to make ethical distinctions, rather than improving their ability to be morally good in their lives or to design ethically in their work.

Despite the correlation between a well-developed ethical sensibility and strong ethical reasoning, the latter quality comes with other features that seem less-than-ideal when designing ethical technology. Because ethical reasoning requires us to explain and justify our ethical evaluations to one another, it can result in a competitive atmosphere, especially within a classroom context. Pitting one ethical theory against another can similarly lead to a situation in which advocates of the various views argue at length. This combative approach can be reinforced by the 5-SM insofar as students tend to side strongly with one ethical inclination over another. Many ethics teachers will immediately recognise this. As many ethics teachers will also recognise, there is often a sharp dividing line between utilitarians and deontologists. A system that focuses on ethical reasoning is geared towards reinforcing these divisions. Nevertheless, we should not forget that ethical reasoning is important and that it is closely linked to developing one's ethical sensibility. This is one of the advantages of the 5-SM. Requiring students to evaluate one another's ethical reasoning can shed important light on their own ethical sensibility, as well as how it can be improved. I return to the idea of ethical sensibility in the next section, where I discuss how an alternative approach to the 5-SM may do a better job at cultivating it.

Finally, the third concern with the 5-SM is what could be described as its general conception of ethical thought as a restrictive practice, that is, the way that it encourages students to take a certain view about what the very practice of ethics is. Strictly speaking, this is not due to the fact the 5-SM comprises five different ethical systems, but rather due to how two of the most popular ethical systems within the 5-SM are dominant – deontological and utilitarian approaches. Although the 5-SM nominally refers to five systems, these two systems are typically given much more attention, in part because they invariably suggest different ways to resolve the same ethical dilemma, or at least very different reasons for resolving these dilemmas in the same way. This is a problem because these two systems view ethics as a system of constraints: ethics tells us what we should not do, it circumscribes the parameters of ethical behaviours, and when it is applied to design choices it invariably makes decisions based on what is morally permissible. Focusing on deontological and utilitarian approaches, then, creates the impression that ethics is most properly understood as a system of constraints. Its primary purpose is to tell us what not to do.

In recent years, the conception of ethics as a restrictive enterprise has been challenged by prominent moral philosophers, especially by those working outside the deontological and utilitarian traditions (Harcourt, 2015: 166; Skorupski, 1998; Taylor, 1991: 4–5; Williams, 1993 [1972]: xiv, 73–81; 1985: 6–8; 2008 [1993]: 41–2). These philosophers distinguish between 'ethics' and 'morality', although they have made this distinction in various ways. One common way is to reserve the latter term (morality) for other-regarding concerns, while reserving the former (ethics) for aspects of our conduct that are directed towards the flourishing of our own lives, including but not limited to our relationships with others. This means that the term 'morality' is significantly narrower in scope than the term ethics because only part of what is constitutive of a good life concerns constraints on how we treat others. Distinguishing the terms in this way means that 'ethics' refers to all aspects of the good life, whereas 'morality' refers to a subset of these concerns. In short, ethical concerns are more wide-ranging. Its parameters reach far beyond our obligations to others, as ethics includes the importance of self-cultivation, or how one lives a life orientated towards health, wealth, beauty, and pleasure. Understanding ethics in this way means that ethical technology – as opposed to technology that does not violate moral rules – can be understood as technology that contributes, facilitates, or otherwise nourishes human flourishing. The remit of ethics is significantly broader than the concerns that the deontological and utilitarian traditions typically prioritise – it requires a vision of a fully flourishing life.

In the next section, I lay out an argument for why an approach to engineering ethics that focuses on ethical exemplars, rather than concentrating on theory, is the most effective means to give students the passion they need to design ethically. I argue that learning values-based theory is vital for engineers, but it comes alive when

channelled through actual characters (whether fictitious or not). As we will see, packaging theory into examples of lived lives has additional upsides too. These relate to each of the main points we explored above. It mitigates the first danger we encountered above, moral relativism, because each ethical exemplar is living to a single and coherent system of values. Building a life requires not vacillating between multiple world-views, but rather requires living according to one world view, even allowing for change, contradiction, and personal idiosyncrasy. Furthermore, a teaching method based on ethical exemplars also has an advantage relating to the second issue we examined in this section. Rather than teaching engineering students the debating skills that are more common in a philosophy seminar room, it asks that they focus on specific examples of a life well lived.

4. SKETCHING AN ALTERNATIVE APPROACH TO ENGINEERING ETHICS

Now that I have examined three criticisms of the 5-SM, we are ready to explore an alternative approach to ethics teaching, one which aims to avoid the three problems listed above. This teaching method asks engineering students to choose their favourite ethical exemplars in public life, think of the values these individuals embody, then to envision how their future technological innovations might be compatible or even actively promote these values. In what follows, I will call this model the 'ethical exemplars method' (EEM). This method aims to encourage programmers to think more deeply about how their future designs might be used, what kinds of behaviours they might facilitate or encourage, and how these creations may contribute to a life-world in which their chosen ethical exemplars would thrive. One strength of this approach is that it is both intellectually and emotionally stimulating. It directly engages soon-to-be programmers at higher-education level by allowing them to share their passion for celebrities and other famous individuals. Because of this it may well be memorable enough for engineering students to remember long after they graduate. This method is summarised in figure 1.

As we can see, the EEM begins by asking online engineering students to identify their ethical exemplars (Stage 1). This should be a collective and discursive exercise. Higher-education students are no exception in finding the question of which contemporary figure exemplifies their ethical ideals very engaging. This is partly due to how this requires students to answer two questions: First, which ethical character traits or virtues are worthy of emulation? Second, which famous figures exemplify them? Asking these two questions is likely to generate intense discussion.

Stage 2 also may well generate heated discussion. Once the ethical exemplars have been chosen, this stage involves deciding which character traits make them an ethical exemplar.

Stage 3 involves a conversion process. This requires students to extrapolate from

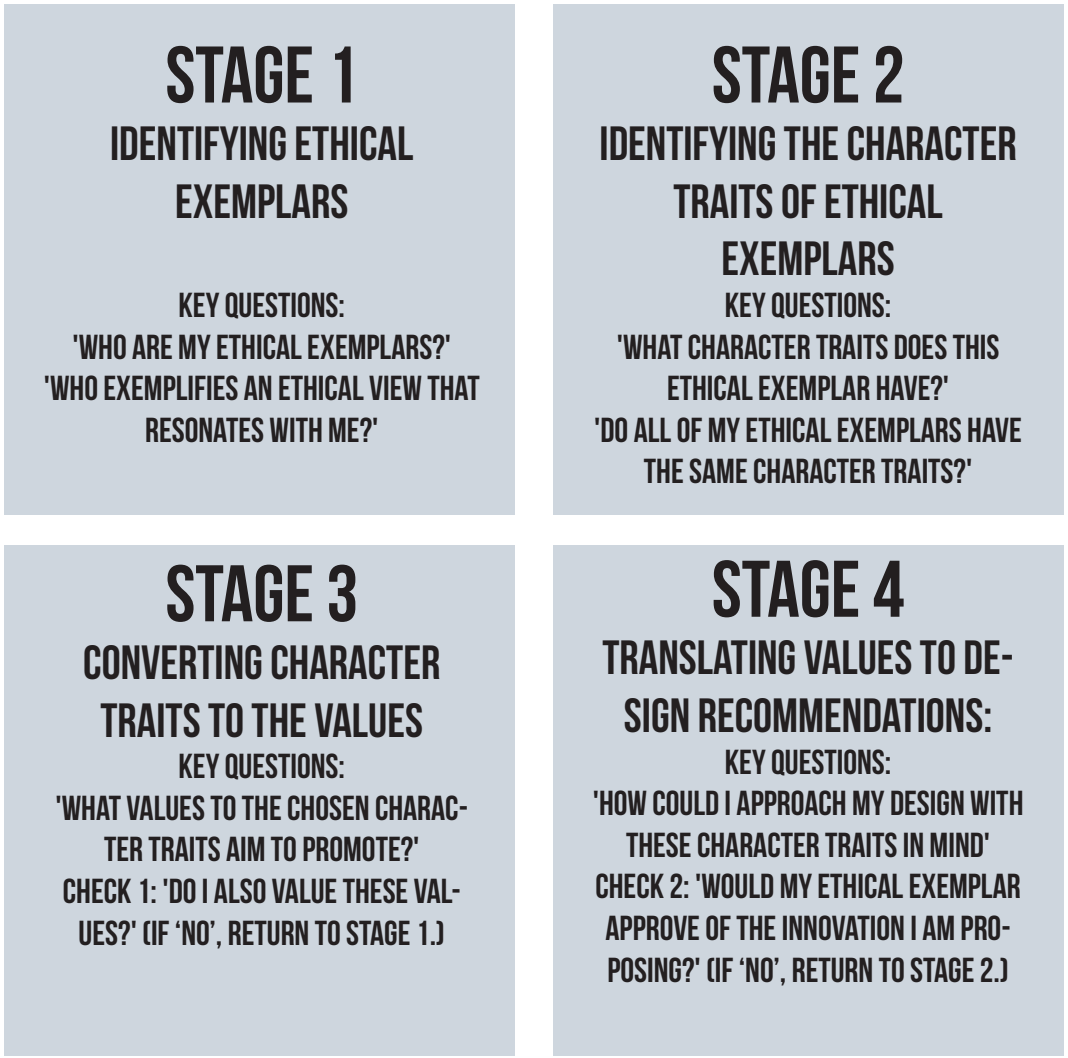

Figure 1. Overview of the Ethical Exemplar's Model (EEM).

virtuous character traits to values. It also requires them to dispense with exemplars if the values of their character traits do not align with their own values. This can happen when the exemplar has numerous character traits, some of which are not ethically relevant or are actively inimical to ethical behaviour.

The final stage (Stage 4) requires students to think about how the values they have identified could be translated into design recommendations. Converting values into design recommendations is difficult, and has been shown to give many challenges. Nevertheless, the values that the students will have from the EEM will be highly personal, so there is some likelihood that they will be easier to convert. The last stage of the process is to ask whether the chosen ethical exemplar would endorse the design recommendation. If not, then there has been a breakdown in the process, and students should move back to Stage 2.

5. ADVANTAGES OF THE ETHICAL EXEMPLAR'S MODEL (EEM)

Now that we have seen how the EEM might work, we are ready to discuss its advantages, so the aim of this section is to tease out how the EEM fares alone, as well as compared to the 5-SM. First, there is reason to think that it is easier to discern one's own values by engaging in a process of identifying ethical exemplars, rather than trying to introspect on one's own values directly. Much psychological research indicates that introspecting on one's own values is hard because our values are typically too closely embedded with our way of life to be discerned easily (Higgins, 1996; Vazire & Carlson, 2010). This means that it is difficult to see one's axiomatic commitments, and the everyday values one lives by, from a first-personal point of view. Values are embedded in and permeate our world to such an extent that it is difficult to abstract them in the way that introspection requires.

Take friendship, for example: identifying one's values can be a distinctive benefit of friendship (Cocking & Kennett, 1998). As Aristotle puts it, friends can act as a 'second self'. They have the power to verbally tell us what we are like much more than we can ourselves, and they provide a lens for us to view our own actions differently. The importance of friends for self-knowledge, especially when it comes to value-related concerns, has been confirmed by both the empirical and theoretical literature (Higgins, 1996; Dennis & Werkhoven, 2018; Longworth, 2015; Vazire & Carlson, 2010). We best come to know ourselves through knowing others, and this applies to our values too. This is indicated by the fact that introspection often yields trite lists of unimaginative values, rather than those that distinguish us from others. Furthermore, by identifying those whose lives exemplify what we value, we develop the power to go beyond the values that we currently live by. Picking one's ethical exemplars allows us to think about what values we aspire to, irrespective of what lives we actually lead. Few would contend that their own life embodies all the ethical values of their exemplar, as this is precisely why an ethical exemplar is chosen in the first place.

Second, ethical exemplars are subject to historical change. The values they exemplify are closely tied to the historical era in which they obtained. We can see this by considering this question: How does asking people from one's generational cohort which ethical exemplars resonate with them differ from another cohort (say, the first cohort's parents or grandparents). There may be some similarities – athletes, film stars, humanitarians, and progressive politicians – but the identities of these individuals will often be different. Take examples from US politics. Generation Y may admire Alexandria Ocasio-Cortez most, Generation X might prefer Barack Obama, whereas Baby Boomers may have been most inspired by the achievements of John F. Kennedy. Each of these famous individuals will resonate with members of the public in a specific way, due to their own experiences. This applies to those who are actively

trying to include values in the online products and services they are trying to design. Because our relationships with celebrities and other famous individuals are highly personal, we can vividly picture their values. This makes it much easier to envisage the kinds of values that one stands for. Asked about the character traits of Alexandria Ocasio-Cortez (known as AOC), certain values come to mind; asked about the ethical commitments of President Obama, other values do. Each of these individuals have a specific set of values that they are associated with. Discerning these values is easy because they are embodied by a person who has often spent their entire time in public life striving to promote a certain way of life.

Third, we can see that 1) discerning the values of ethical exemplars, then 2) applying them to the design of technology, differs strikingly from the 5-SM. Instead of trying to apply five abstract ethical theories to concrete design choices, the EEM starts with a concrete embodiment of values – how an admired person has lived their life – then works back to the values that the person ascribing the values prioritises. While this process is not always easy, it connects up several desirable outcomes. The ethical exemplars that students pick out are typically those with highly emotive and personal values. They differ according to, say, which generation one is in, and there will be many personal differences on top of this too. The advantage of this specificity is that these values really count for the person who expresses them, they are easily memorised, and they are highly concrete. For these reasons, the ethical exemplars model does well compared to the 5-SM in terms of providing a way for online engineering students to think clearly about how they chose to incorporate values in their design practice.

So far, then, we have seen that the EEM has strengths in terms of how it can elucidate a design student's values; it makes these values clear to the student in a way that mere introspection would struggle to do. At this stage of the analysis, however, we have discussed ethical exemplars in general, focusing on how these exemplars might be useful in discovering the kinds of values for which one wishes to design. This is useful, as it reveals the general characteristics of the EEM, but to understanding how effective this model is for online engineering in particular, requires that we think more deeply about the kinds of exemplars and role models that are popular online. The EEM is widely applicable, but it is particularly useful when we think of online celebrities and prominent persons who can be used to encourage online engineers to design for digital well-being. As we will see, the first reason for this is because many of today's most popular public figures have a strong online presence, one that only increases our fascination with the online space.

We can see this demonstrated by a recent survey commissioned by Lego Group. Although this survey was intended to mark the 50th anniversary of NASA's moon landing, researchers from Harris Insights and Analytics were shocked to discover that in a cross-cultural sample from the UK, the US, and China three times as many 8- to

12-year-olds wish to be YouTubers than astronauts. Given that this demographic has consistently said that being an astronaut is the top choice of profession since Neil Armstrong landed on the moon in 1969, this change is highly significant.

Needless to say, the lives of YouTubers embody many values; some ethical, some not. Many of these values are not the kind that could be used to inspire ethically aligned design. Nevertheless, online celebrities often use their platforms for explicitly ethical aims. These aims express their values in powerful ways that resonate with millions of fans and followers, including many aspiring designers. Take Kim Kardashian West, for example. Since 2018 Kardashian West has increasingly turned to activism. In 2019, she tweeted that 'This Dutch 'tradition' called: 'Black Pete' is disturbing!' (17 November 2019). Not only did this tweet appear in the feeds of Kardashian West's 70 million Twitter followers, but it was also retweeted widely, which led to numerous articles about the so-called tradition of 'Zwarte Piet' appearing in the Dutch and international press. In a similar intervention, in the aftermath of the 2020 US election, Kardashian West used her platform to discuss the dangers of social media. She writes: 'I love that I can connect directly with you through Instagram and Facebook, but I can't sit by and stay silent while these platforms continue to allow the spreading of hate, propaganda and misinformation – created by groups to sow division and split America apart' (September 2020). How can this tweet be used to discern Kardashian West's values? One theme that it is possible to see is a clear commitment to social justice. She is worried about the current state of the world (and how social media platforms have contributed to this state) and wishes her followers to help her change this. Similarly, as the 'Zwarte Piet' example shows, Kardashian West reveals that she is prepared to speak out against ingrained historical prejudice that she believes is masquerading as a 'tradition'.

The online activities of celebrities such as Kardashian West show how celebrities who resonate with young people can be used to ignite a discussion on values. While Kardashian West may be regarded by some as a rather unlikely ethical exemplar, we have seen above that she demonstrates at least the intention to use her platform to discuss a range of ethical topics and to speak out against social injustice. Asking those who regard her as an ethical exemplar will indicate how relatively easy it is for them to think of the values that her tweets on these matters promote. It shows a strong commitment to racial justice, criticism of gross cultural insensitivity, willingness to challenge others about the moral wrongness of their views, etc. All these values can be discerned in her highlighted tweets. Similarly, the 2020 comment on social media platforms like Instagram and Facebook reveals a keen political interest in the dangers of the free distribution of unmoderated content.

From this we can see that many celebrities and famous individuals are interested in expressing their values through their public actions. Furthermore, programming and design students are familiar with the lives of famous individuals as ethical exem-

plars, so this could be a useful way to extract their values. The reasons for regarding famous individuals in this way will no doubt vary, but there is a significant trend towards online celebrities taking up explicitly ethical positions (and being roundly criticised when they do not). Ethical behaviour is, then, an increasingly important part of the persona of today's online celebrities, which means that the lives of these kinds of famous individuals are eminently able to be analysed in ethical terms. One of these terms is values. Once students are able to identify those celebrities that they regard as ethical exemplars, discussing values is a relatively short step.

6. CONCLUSION

In closing, I wish to stress that there is clearly much that is valuable in the 5-SM. Compared to the very real possibility that engineers may receive little or no ethics education, the 5-SM is highly preferable. Moreover, the EEM can easily be used in conjunction with the 5-SM. It is not a zero-sum game, and the disadvantages of the 5-SM can be mitigated when this model is complemented by another approach. Such a combined approach could preserve much of what is valuable in existing approaches to ethics education, as well as expanding it in important ways. It is also worth acknowledging that the 5-SM does have some philosophical resources that will be used in developing the EEM. Each of the five systems of the 5-SM makes use of ethical exemplars to practically illustrate what a flourishing life looks like. While the use of such ethical exemplars is most common in the virtue ethics tradition, the key thinkers in, for example, the capability approach and care ethics also make use of them. This is because illustrating what it is like to have virtues, capabilities, or to have care-orientated concerns can be easily demonstrated by using examples of individuals whose lives have been motivated by these things. The path towards an improved way of teaching ethics to online designers and engineers may well benefit from being updated, but it is possible to enjoy the benefits of the new approach I have sketched above in combination with existing approaches.

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TU DELFT STUDENTS IN CLASS. PHOTO BY R. ROCCO.


1.039.

TEACHING ASPIRING INDUSTRIAL DESIGNERS TO UNDERSTAND VALUE(S)

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ABSTRACT

This chapter describes 'Understanding Values', a course that teaches aspiring designers who aim to design for values to disentangle how different notions of value and values influence the design process, the design outcome, and how the outcome is evaluated. The course strives to make abstract values more tangible by asking students to analyse the values supported or hindered by an existing product-service system and how it brings or destroys value for a broad range of direct and indirect stakeholders. Various theories, methods and tools are brought forward to help them perform their analysis and come up with a more acceptable alternative value proposition. Students are also encouraged to conduct high-quality dialogues to reflect on their own values as designers, the ethics of design and the value tensions they experience during the course. These reflections in turn serve as input for the development of their own code of ethics.

HUMAN VALUES, VALUE AS WORTH, VALUE TENSIONS, VALUE PROPOSITION, ETHICS OF DESIGN

1. INTRODUCTION

Human beings have always engaged in design to improve their lives, whether to enhance food provision, the quality and availability of shelter, or comfort in general. In other words, designing has enabled individuals to fulfil their needs, to survive, and to thrive. A specific kind of design focusing on designing products, industrial design, emerged with the Industrial Revolution. The goal of industrial design was to create value for users and consumers who would buy and/or use these products, thereby enabling organisations to capture economic value (Hesket, 2009). Arguably, our capitalist focus on economic value has helped to lift many people around the world out of severe poverty; however, it is now clear that this has also excluded many others, while leading to unprecedented climate change, pollution, and loss of wildlife and biodiversity.

WE CAN DO BETTER: DESIGNING FOR VALUE AND VALUES

Based on these observations, industrial designers are asked to do better. Critics and scholars urge us to reflect on what is destroyed in the act of creation (e.g., Papanek & Fuller, 1972; Tonkinwise, 2014; Bowles, 2018; Monteiro, 2019), and on what really deserves to be created as opposed to what can be opportunistically made available to users to capture economic value. As designers, we have to ask ourselves what impact our design outcomes will have on health, happiness, democracy, and ecologies. We have noticed that many of our students feel the same and want to do better; the question is, how can they translate their intentions into design decisions? Value Sensitive Design (VSD) or Design for Values (DfV) are approaches developed to consider (moral) values deliberately and continuously in the design process with the intention to improve design outcomes for a broader range of stakeholders. In this chapter, we do not intend to argue that creating value for users and enabling capturing value for organisations should be left out of the design process, because, after all, this endeavour can help the viability of the outcome. What we mean by doing better is that while designers strive to find interesting value propositions for users (possibly to capture economic value), they are also consciously and explicitly thinking about the values of – and value for – other stakeholders and the consequences of design outcomes on those not directly interacting with the outcomes.

UNDERSTANDING VALUE(S): A COURSE TO OBTAIN AN UNDERSTANDING OF THE VARIOUS NOTIONS OF VALUES INVOLVED IN DESIGN PRACTICE

Successfully designing for values requires an understanding of the notions of values involved in the design process. With this in mind, the renewed BSc in Industrial Design Engineering at TU Delft proposed the introduction of a course named 'Understanding Value(s)'. The course runs in the second semester of the first year of the curriculum. An overarching aim of the semester is to enable students to learn how to design products with a digital existence beyond their physical manifestation and/or how to design business models that comprise a cohesive combination of a product and a service: a product-service system (PSS). The knowledge imparted in our course aims to serve as a basis for reflections regarding the desirability (in the broadest sense) and viability of not only the PSS developed in the design project running in parallel, but also all the subsequent design projects the students will be involved in. Specifically, the course seeks to disentangle how different notions of value and values influence the design process, the design outcome, and how the latter is evaluated. We aim to explore value and values with literature originating from different fields: design, economy, psychology, sociology, anthropology, and philosophy.

To illustrate the course, we draw on our practical experience in design projects, and on our research and teaching experience in social venturing, circular design, and sustainable consumer behaviour, where understanding value(s) plays an important role. For example, research in sustainable consumer behaviour often highlights gaps between the environmental values of individuals and their environmentally supportive behaviours. These gaps are often explained by tensions in how individuals hierarchise their values (e.g., safety and sustainability) but also tensions between values and value (e.g., the price premium to which consumers must consent for a more sustainable alternative). A commonly experienced tension in the course on 'social venturing' involves capturing economic value and addressing a societal issue in parallel.

This chapter serves as a map for the course and may give pointers to the readers on how to apprehend the various notions of values for design education. We start by clarifying how the notion of 'value' differs from 'values' and outline our choice of mediation approach concerning design outcomes and their value. Following the structure of our course, we explore the meanings of value(s) from different stakeholders' perspectives and further clarify how we plan to help students uncover what is of value to whom and why. The learning activities, besides lectures, are developed to enable students to experience value tensions. Students are asked to engage in dialogue sessions, reflect in groups on an existing product-service system and modify the value proposition. The course culminates in a personal code of ethics, capturing the value tensions experienced and decisions on how to deal with these tensions. The blue boxes highlight some of the tools we provide to students

to identify and understand stakeholder values, map the value of an existing product-service system for different stakeholders and modify the value proposition of this product-service system to one that might be more morally acceptable, or argue why it should stay as is. The grey boxes illustrate the arguments brought forward using examples from our own research and practice.

2. VALUE AND VALUES, TWO CLOSE TERMS WITH SEMANTIC DIFFERENCES

VALUE(S) – GUIDING PRINCIPLES OR QUALITIES WITH WORTH?

People frequently use the words value and values in common language without explicitly explaining what they mean by these words. However, the plural and the singular version of the word can have distinct meanings. For example, in economics, the notion of value is most often used in its singular form, referring to the economic or utility value of an object. In contrast, those in the field of psychology generally refer to the notions of human values as part of one's personality; that is, they most often use value in its plural form, in the context of a set of values. In an analysis of how the notions of value and values play a role in the design process, Bos-de Vos (2020) distinguished between values as ideals or guiding principles and value as a descriptor of qualities with worth. Following this distinction, values are considered as abstract beliefs about what is of value in life in general, while value is a quality attributed to a specific design outcome.

RELATIONSHIPS BETWEEN VALUES AND VALUE

Notions of both value and values can play a role in the design process and are interrelated. Collaborating actors, who may bring different ideals and underlying motivations, co-create a product, a service, a system, or a combination of those, which aims to create value or worth for different stakeholders (e.g., clients, users, society). In the evaluation of the design outcome, value judgements regarding its desirability will be highly influenced by the values of the 'evaluator' (e.g., the company that commissioned the project from a design agency, the user, a government, or indirect stakeholders).

In addition, it is important to emphasise that the choices regarding the development of a design project, or how to embody certain values in a design outcome, are based on the values and ideas of those involved in the design process. As a result, these choices can neglect the values of those not involved, fail to tap into the full potential of the

design, and lack value for those left out of the process– or even destroy value. The research of Bos-de Vos (2020) brings forward that consciously thinking about 'value' and 'values' in all their meanings might assist designers in opening up discussions about values and interests, address tensions, and increase the probability that those involved can collectively work towards a broadly valued end result.

3. MEDIATION PERSPECTIVE ON DESIGN OUTCOMES AND VALUE- INFLUENCE ON TEACHING AND DESIGNING

DESIGN MEDIATES

In our course, we adhere to the view that design mediates how we exist in our world and how we experience our world (Verbeek, 2006). The mediation view also entails that values can be intentionally (or unconsciously) embodied in a design, but we cannot fully predict how people will experience and interact with that design. Therefore, how the design will promote or hinder certain values is a result of an interaction between the design and people (Friedman & Hendry, 2019). This view differs not only from the instrumental view on design, whose proponents contend that designs are value-free because they are only instruments in the hands of people (e.g., 'guns don't kill people, people do'), but also from the deterministic view, according to which values are inherently embedded in designs.

To illustrate the unpredictability involved in promoting or hindering values, we share a reflection on designing a smart energy system to make patterns of energy use at home more sustainable. We considered the protection of privacy from intrusion by the data collector (so that the energy provider would not be able to access data about energy usage which are strongly related to lifestyles and habits) but discovered in our first trial that the privacy of people living together might still be affected. Our system facilitated the surveillance of co-dwellers, which was not appreciated by adolescents who value their autonomy and privacy.

WHAT IS WORTH?

Coupled with the mediation view, we define value to exist in the relationship between object (in our case the design) and subject (the 'evaluator' of value). This means we have neither a subjective view on the value of design outcomes (a matter of taste) nor an objective view on value (inherent intrinsic value of a design). The value attributed to a design is often more concerned with the value of what it enables or

disables more than the design itself (Tonkinwise, 2014). In addition, value attributes are not static. Value changes constantly as products age, as people change and as their social contexts and societies change (Boradkar, 2010). Something that is considered to be of value by some people at a certain place and moment in time can lose its value – or be considered to be destructive to what is of value – in a different context, to different people, or even to the same people. For example, the symbolic value of a ring somebody was given by a romantic partner will change when the relationship ends.

CONSIDERING DIFFERENT TYPES OF VALUE ATTRIBUTES

In a chapter about the worth of things, Boradkar (2010) defines 11 types of value that individuals can attribute to things: economic, functional/utilitarian, cultural, social, aesthetic, brand, emotional, historical, environmental, political, and symbolic value. Such a taxonomy enables designers to put words on the different qualities with worth. Boradkar insists that while this taxonomy can help to map some of the basic drivers people use to evaluate the worth of things, the complexity of valuing things should not be underestimated. Often, different types of value can overlap (e.g., the symbolic value and the brand value of a smartphone often coincide), or people derive the general worth of an item from an aggregate of several value types.

ITERATE AND REFLECT

Our stance entails that we want to teach our students that a reflective, iterative process in design is important when considering value(s). This means that designing for value(s) is not very effective as an afterthought, because that makes it more likely that a drastic redesign (or even the cancellation of the launch of the design outcome) will happen when the design project is nearly finished, at which point all resources allocated to the design project have already been depleted. Students might experience the ineffectiveness of considering values as an afterthought in our course, as they will be assigned an existing product-service system to evaluate. We hope this experience is an argument to engage in conceptual and empirical inquiries at

an earlier stage in order to define design requirements. However, we would like to bring forward in our course that developing a list of requirements only in the early stages of the design process will not be effective either as we cannot fully predict how people will interact with the design outcome or how others will experience its value. Instead, to get designing for value(s) right, the process must be a constant iteration of conceptual (conceptualisations of relevant values and possible value tensions), empirical (investigation of the context in which the design is situated), and technical investigations (what to design) (Friedman & Hendry, 2019).

4. UNDERSTANDING HUMAN VALUES AND VALUE TENSIONS

HUMAN VALUES IN A DESIGN CONTEXT

In a design context, understanding the human values at stake is fundamental for two reasons. First, these values will influence the directions that collaborating actors/stakeholders co-creating the design are willing to take. Second, human values will influence how the design outcome is valued by users and others affected by the project. Therefore, we make an extra effort here to define human values. There are many definitions of human values, but they all share multiple features (Schwartz, 2012). Values are concepts or beliefs about desirable end states or behaviours that transcend specific situations, guide the selection or evaluation of behaviour and events, and are ordered in terms of their relative importance in a value system. Human values are learnt, socially shared principles that can help us balance and fulfil three universal types of needs for our survival: basic needs of individuals, needs for coordinated social interactions, and survival needs of groups (Schwartz & Bilsky, 1987). Van de Poel and Royakkers (2011) emphasise the social structuring character of human values and define them as 'lasting convictions or matters that people feel should be strived for in general and not just for themselves to be able to lead a good life or realise a just society'. Values are different from attitudes and preferences in that values are abstract ideals that are important to us in general while attitudes and preferences are more concrete and represent things that we like or dislike (Maio, 2016).

A TAXONOMY OF HUMAN VALUES

Several taxonomies of human values were developed to determine distinctive value clusters and values that are close to or oppose each other in different domains like religion, philosophy, and psychology. One of the most widely used and tested taxonomies was

developed by the social psychologist and cross-cultural researcher Shalom Schwartz. In 2012, he published a refined version of the value theory defining 19 values (see Figure 1), which has been tested worldwide (in 82 countries) and appears to be shared in different cultural settings (Schwartz et al., 2012). The values can be categorised into four higher-order values: conservation (i.e., self-restriction, order and avoiding change), openness to change (i.e., readiness for new ideas, actions, and experiences), self-transcendence (i.e., transcending own interests for the sake of others), and self-enhancement (i.e., pursuing own interests). In addition, the values placed on the left have a social focus (i.e., they revolve around others and established institutions) while those on the right have a personal focus. Furthermore, the values at the top of the circle express growth and self-expansion and are more likely to motivate people when they are free of anxiety, while the values at the bottom are directed towards protecting the self against anxiety and threat (Schwartz, 2012). It is also important to note that while these values are rather stable within individuals, changes in life stages (e.g., becoming a parent), and cultural transitions (e.g., moving to a new country, starting a job) can cause a change in their value system (Maio, 2016).

Though the basic human values are seen as part of an individual's personality, it is worth noting that cultural values or normative value orientations can be considered when exploring the value systems on which cultures – that is, nations, regions, religions, but also professions, organisations, or even teams – may differ (e.g., hierarchy, egalitarianism, harmony) (Schwartz, 2011).

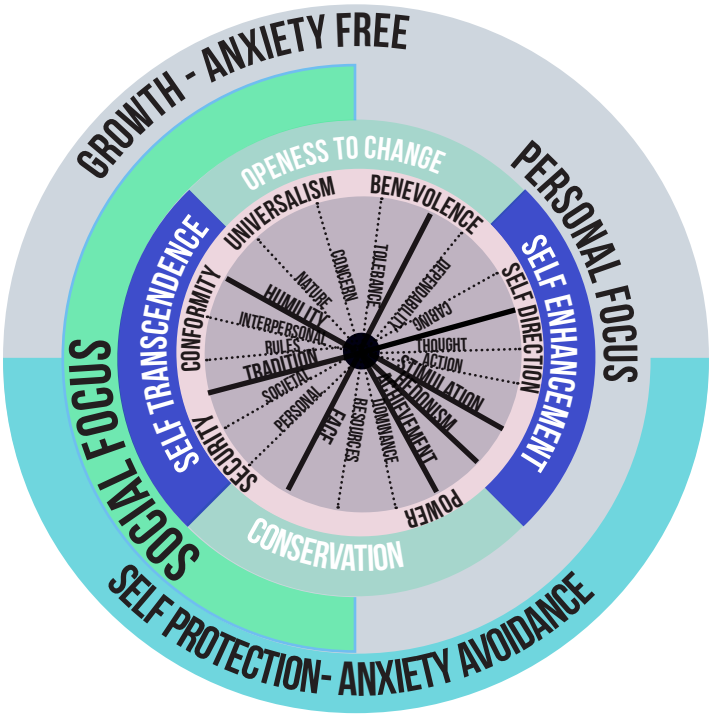

Figure 1: Circular motivational continuum of 19 values, adapted from Schwartz (2012).

VALUE SYSTEMS AND INHERENT TENSIONS

People generally share and agree on values; however, they can have divergent value systems and experience value tensions. A value system corresponds to the order and priority an individual, or a group of individuals, grants to their values (Schwartz, 2012). While individuals may share a certain set of values, the relative importance of these values will often be ordered and weighted differently. For example, most people will agree that equality (a universalist value) and personal health (a conservation value) are important values. However, when considered in the context of a whole set of values, people might order them differently, which will in turn lead to different value judgements and behaviours in certain situations.

We can experience value tensions at various levels: among individuals, in and between groups, in and between nations. It is important to note here that when we disagree amongst each other on what is worth pursuing or not, this does not mean we have a completely different set of values, but mostly that values are prioritised differently. People or nations that assign a high priority to conservation values in their value systems will especially value tradition and conformity to rules, which might create tensions with people whose value systems prioritise values related to openness to change and self-direction. The latter will value freedom and choosing their own goals, which might conflict with prevailing traditions and rules. Finally, tensions can also emerge between people who share the same or very similar value systems. Abstract values need to be operationalised in our decisions, meaning that they have to be translated into more concrete actions and people can disagree about the actions needed to pursue a value.

> Values themselves are often too abstract to truly be in opposition. For example, sustainable and development are two words that are easy to put together – the resulting compound term sounds good to us, but when we want to connect decisions and actions to these two words, we notice that tensions arise. Pursuing those values simultaneously is easier said than done.

We also experience tensions regarding the operationalisation of our own values. For example, one can experience tension between a value with a personal focus such as hedonism and a value with a social focus such as care for nature. A typical example is someone who is torn between caring for nature and pursuing their hedonistic values by travelling by plane to a faraway destination, which would generate an unbalanced personal contribution to global greenhouse gas emissions and thereby harm nature (see https://www.theguardian.com/travel/2019/jul/31/carbon-calculator-find-out-how-much-co2-your-flight-will-emit).

When designing a service to reduce the number of severe bike accidents among Dutch seniors, we had to deal with a tension between the values of safety and autonomy. Our objective was to promote, amongst other things, helmets, mirrors, and three-wheel bicycles to improve safety for senior bike riders on the road. However, in interviews, we learned that many people did not want to be seen with these aids and considered it patronising when people around them would start suggesting them (autonomy). Although they did value their own safety, it was hard for them to acknowledge they were getting old (and therefore experienced reduced sight, hearing, and reaction time, while finding it harder to turn their head) and needed more aid to remain safe. Giving up their bike was not an option either, because riding the bike was connected to the values of freedom and autonomy. However, talking about getting older and remaining safe by using an aid was often taboo and went against their sense of autonomy.

5. DESIGNING FOR VALUES

AN ITERATIVE PROCESS: FROM ABSTRACT TO CONCRETE AND BACK

As discussed above, abstract values need to be operationalised, or in other words translated into more concrete actions, and for designers this means translated into a design. Effectively designing for values is an iterative process. We might start with a specification of value-related goals and further define concrete means to get there. In the early stages of the design process, this might entail translating values into design requirements, going from values to a set of norms, and then creating even more design requirements, as suggested by van de Poel (2013). However, as we cannot be sure that others will agree on how values are to be translated into requirements, or into design outcomes, we can also go from concrete to abstract in our evaluations. Then we move on to the attributes of our design outcome, whereby we ask others about the perceived consequences and related values (see blue box on laddering). In practice, students can perform laddering interviews and see how attributes and experienced benefits/harms connect to values. In this activity, they might uncover that we can disagree on the 'goodness' (or 'badness') of specific attributes, while the reasons for making these judgements are related to the same values. Alternatively, they might find out that people agree on the 'goodness' (or 'badness') of an attribute, but for different reasons.

LADDERING

An interesting technique for designers to evaluate how abstract user values are supported or hindered and how they are related to the definitions of the worth of design outcomes is 'laddering'. Laddering has been used since the end of the 1980s to uncover means-end chain models (Reynolds & Gutman, 1988). This technique originally comes from the domain of personality psychology (Hinkle, 1965) but has mostly been used in marketing and advertising, and more recently in user experience design (Abeele & Zaman, 2009). In the marketing field, it has been mainly used to get from product attributes to the underlying personal values influencing purchase (i.e., the means-end chain). According to the Means End Chain theory, there is a hierarchy of consumer perceptions and product knowledge that ranges from attributes to consumption consequences or benefits to personal human values. By continuously asking in an interview 'why is that important to you?', one can go from specific appreciated product or service attributes to benefits and, finally, to personal values. For example, handlebars could be positioned on a bike (attribute) in a way that makes it possible to mount a child seat there (benefit) and thereby contribute to a sense of freedom, a value that is worth pursuing. However, it is important to note that while sometimes attitudes and preferences for certain attributes and benefits are driven by values (e.g., one may have a positive attitude towards the shape of a bike helmet because it resonates with their values of personal security), this is not always necessarily the case (e.g., one can dislike eating melon without it having anything to do with their values).

While performing laddering interviews with car owners, one of the interviewees stated that he was happy that he drove an electric car. We asked him why that was important to him. He replied that he loved new technology and always wanted to be at the forefront of using new technologies (stimulation). This reason is different from the reason why our government promotes electric vehicles: to reduce emissions for liveability in city centres, electrify energy demand to become less dependent on fossil fuels for sustainability, and independence from unstable nations.

DESIGNING FOR VALUE TENSIONS

In the design field, we have been particularly interested in how to design for value tensions on all levels (e.g., Ozkaramanli, Desmet & Özcan, 2016; Dorst, 2015; Tromp & Hekkert, 2018; Friedman & Hendry, 2019). In dealing with value tensions, van de Poel (2009) distinguishes between optimising and non-optimising design methods. When optimising – or maximising – we are looking for the best solution. The ambition is then to make abstract values measurable and testable in order to compare outcomes and/or to define a 'super value' overarching all other values, such as human happiness (following the utilitarian view of Bentham and Mill (Troyer, 2003)). Happiness is then considered the ultimate purpose of society and human life. It would mean we choose to design for the outcomes that cause happiness for the greatest number of people and, as a corollary, decrease pain for the greatest number. However, the meaning of human happiness is still vague. So, we would have to define happiness more accurately, which would entail revisiting the underlying values. Furthermore, in practice, it would also require us to create a complex model with value indicators aggregating how much happiness and pain a design project may cause. We would thus base our decision on the result of this model to define the best solution, even though value indicators are often incomplete and misleading. Another pitfall of maximising happiness for the greatest number lies in the fact that it may fail to protect minorities against oppression. Lastly, such an approach also fails to take non-human well being into consideration.

Though an optimisation approach for a super value like human happiness might be valuable in setting grand ambitions, non-optimising methods might be more apt for the job of dealing with value tensions to make some progress. One of those non-optimising methods is 'satisficing' (Simon, 1957). Satisficing helps us to continuously adapt and deal with vagueness and value pluralism. It entails that we look (iteratively) for solutions that are 'good enough' considering thresholds related to relevant values. This also means we need to judge what is 'good enough' when dealing with value tensions, which entails that we need to understand the values at stake: what do these values imply in this context for different stakeholders and why are these values important in this context for different stakeholders? Different conceptualisations of the values at stake and considerations about whether they are worthwhile pursuing in this context may lead to alternative options to address the value tensions. Hence, the identification of stakeholders is important when designing for values. To this end, our students will be asked to identify the stakeholders – in their broadest sense – of an existing product-service system.

6. IDENTIFYING STAKEHOLDERS

WHO VALUES WHAT?

In our course, we will build up complexity by considering the value of the PSS for different stakeholders, starting with the users, the organisation, and its value network. We then add the stakeholders beyond the direct and the intended ones to our consideration set, exploring how the PSS affects societies, the ecologies in which they live, and the concepts that are important in these societies.

USER VALUE(S)

The user can be defined as the person who uses the design outcome (in our course the PSS). One of the most common design approaches, 'user-centred design', considers the user the main beneficiary of the design outcome and therefore the ultimate judge of value of the design outcome. Designers following this approach therefore perform user research and design throughout an iterative process to optimise user experience and, by doing so, increase the probability that the design outcome will be valued by the user (Norman & Draper, 1986).

DESIGNING FOR DILEMMAS

In the context of user-centred design, designers can explicitly address value tensions felt by a user. Ozkaramanli, Desmet, and Özcan (2016) bring forward three specific directions for doing so. The first is resolve where the design outcome enables the user to pursue two opposing values simultaneously. The second is moderate where the design helps the user to prioritise pursuing one value over the other. The last direction they mention is trigger, where the design outcome aims to draw attention to the tension without facilitating the pursuit of one of the opposing values. The idea of addressing value tensions explicitly is that designers can heighten the perceived value of design outcomes.

How much money a user (or a consumer) is willing to pay is considered a fundamental index of user value, but so too are the time and effort invested during the use phase (Zeithaml, 1988). However, as mentioned before, how value is attributed

to a design outcome is far more complex. We cannot fully predict how users attribute value or how their value system couples with the outcome. Symbolic user value, for example, relates to the more abstract meaning that individuals attach to their products/services. This value is sometimes disconnected from their utility or from the meaning that was once designated by the producer. For example, some individuals chose the brand Fred Perry to express their belonging to far-right ideologies. The brand itself had to withdraw some of its shirts from the market and publicly express its disagreement with far-right values. In this course, students will first define the intentional value proposition based on publicly available information on the PSS and compare the value proposition to how users possibly attribute value and which values the attributes are associated with. When redesigning the value proposition, they can consider the users' value tensions that they might have uncovered in their analysis.

To exemplify how user value can change over time, our research about consumers' replacement behaviours revealed that in addition to a loss in functionality, a common cause of premature replacement was 'satiation': a phenomenon in which people enjoy a product less the more often it is used. In this case, the emotional value that individuals assigned to their product decreased so much that people would deem their products worthless even though they did not demonstrate any loss in performance. Thus, in design for product longevity, designers should strive to develop strategies to keep the perceived value as high as possible for a long period of time (e.g., not only via a timeless design style, design for product care, and repairability, but also by decreasing the rhythm of new product launch) and to heighten the perceived value of the old product (e.g., via upgradeability).

ORGANISATIONAL VALUE(S)

To be successful, for-profit, non-profit, and public organisations need to remain of value for others. For-profit organisations mainly do so by continuously creating new value for their existing or new customers and capturing economic value for their shareholders. How an organisation intends to be of value for the receiving party is expressed by its value proposition(s). A value proposition often contains a target customer, the task that the customer can complete with the design, a statement of the need or problem solved and the expected benefit(s). A business model explains how an organisation aims to capture economic value (Bowman & Ambrosini, 2000; Lepak, Smith, & Taylor, 2007). For-profit organisations need to capture economic value to generate profit, and by doing so create economic value for shareholders. The purpose of for-profit organisations is predominantly understood to be the maximisation of shareholder wealth (Moore, 2000).

Organisations often perceive it as difficult to pursue both the creation of economic and social value. Social value is often ill-defined but can be found in goods or services that are perceived to have a positive impact beyond economic value: a positive impact on our ecology, our (collective) health or happiness, for example. While for-profit organisations must keep in mind their social value (to have a licence to operate), non-profit organisations traditionally focus on trying to create social value rather than economic value. Non-profit organisations aim to fulfil a social mission and are constantly looking for better ways to do so (Moore, 2000). A big source of revenues for a non-profit organisation is often its donors – and thus a non-profit organisation tends to satisfy the donors' desires in contributing to a cause. However, boundaries between for-profit and non-profit are blurring. Creating economic value and social value can be conflicting endeavours, but numerous organisations today incorporate both to some extent, as succinctly illustrated in Figure 2 in the business model spectrum (Alter, 2007). Showing this typology to students and asking them to plot the organisation behind the product-service system on this spectrum is meant to break down the traditional dichotomy between non-profit and for-profit and evaluate examples of organisations that are somewhere in between and how they make it work (e.g., new ownership models and economic value capture strategies).

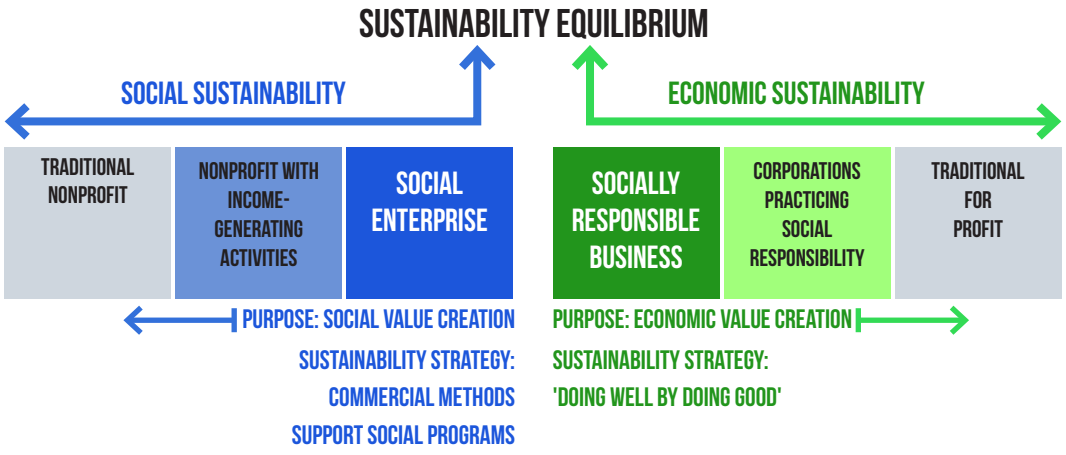

Figure 2: Business model spectrum (Alter, 2007).

The business model spectrum is always discussed in the master's course on 'social venturing', where the aim is to find a 'problem-solution' fit for an issue in society they are passionate about and to come up with ways to make it economically viable. We invite guest speakers who have made it work. One of the guest speakers is alumnus Karthik Mahadevan from Envision. He and his team have built a company around making life easier for the visually impaired with recognition software, for which the users pay a fee. His argument for having his users pay for the service is that this provides a better feedback loop concerning the quality of his service for his users than a traditional non-profit, which gets money from funders who often do not experience the issue themselves directly. If the service decreases in user value, so will his revenues, so successful value capture and user value for a marginalised group in society are tied together.

Students are also asked to identify the core values of the organisation, to reflect about the way the organisation intends to capture value with this PSS and whether it is aligned with their core values. The overall (socially accepted) purpose of organisations is usually communicated in the form of a mission and vision statement. Mission and vision statements embody, among other things, the values of an organisation. Being consistent with the mission while creating value and capturing value can be challenging. Mission drift, which can be defined as straying away from the original mission, may occur when seeking to capture (more) value or due to dependence on funders (Jones, 2007). Organisations commonly have one or multiple explicit core values (Urde, 2003). Core values are intended to guide the behaviour and decision making of employees (like human values do), and thus also of their (in-house) designers. The core values are the shared guiding principles of an organisation, and, like brand values, are also intended to help to manage expectations from the audience. Organisations try to embody their core and brand values in slogans, symbols, and product or service designs. For example, one core value of a car brand can be safety. This brand can communicate safety via the design of the car (e.g., the sound made by the doors when they close). Thus, design can be a means to convey organisational values and will appeal to consumers who hold personal security high in their value system.

We do not include a PSS initiated by a public organisation in this course, but it is worth mentioning here that creating value works differently for public organisations, and designers are increasingly often working for or collaborating with public organisations. Public organisations create public products and services that create public value with public resources. These public resources can be used to create such products and services when citizens (often their representatives) have agreed that it is publicly valuable to do so (Moore, 2000) – for example, making infrastructural investments to make bike riding in the city safer and more pleasurable, so more people will choose to bike instead of using other modes of transport. Inclusive design, related to the accessibility and usability of design outcomes by diverse people, is often assigned a more central role in designing these public products and services.

THE VALUE NETWORK OR ECOSYSTEM

All types of organisations need partners and suppliers to be of value. Value chains used to consist of sequenced activities to manufacture physical products. Traditional value chains were composed of organisations involved in extracting materials from the ground, refining the materials, making parts, assembling parts into products, distributing the products to shops, selling the products to consumers, and after-sales services. These steps were considered part of a supply chain and each step would add value. With the increasing importance of servitisation, digitalisation, and circularity in our economies, innovation has become more complex, and organisations are nowadays more often established within a value network or ecosystem. In digitised supply and demand, the activities are not linked in a linear sequence, unlike in the physical world (e.g., Peppard & Rylander, 2006). The sequential value chain also does not apply to a circular economy where products are shared, leased, reused, repaired, and refurbished, and where eventually materials are restored and recovered to be of value in another product instead of being simply 'disposed of' at the end of the chain (Kalmykova et al., 2018).

So, to accommodate the context of the product-service systems that our students are evaluating, we prefer the idea of a value network. We define the value network as the ecosystem of direct and intended stakeholders in a design project that contribute to establishing the value proposition. By learning how to analyse the network of interdependent partners and suppliers involved in the PSS, our aspiring designers take a first important step in widening the traditional focus on user/consumer and organisational value(s). Mapping different types of value flow in an ecosystem can help open discussions about possible conflicting interests between partners/suppliers and trigger a discussion on potential inclusion of stakeholders that might also have an interest (den Ouden, 2013). In this, it is helpful to reflect on whether the partners promote the same values or at least do not hinder prioritised values. For example, if security is important for an organisation, but it uses a data service that is not very proactive in prioritising data security, it would be good to select a different partner.

In a project to design a 'smart grid' we had partners who delivered the hardware: the screens on the wall (stakeholder A), the smart washing machines (B), the smart meter (C), the front-end software programming and maintenance (the user interface that runs on these screens) (D), and design (E), the back-end programming (the data collection and generating and sending of forecasts and the flexible tariff structures) and maintenance, but also the owner of the servers that were used (F), the energy supplier with flexible rates (G), the grid operator that was also the main service provider for maintenance (H), and all the parties involved in designing, mining, assembly, and shipping of the hardware (I-Z?). This last group remained invisible to us, however, but if we had been more curious, we could have been more selective in ways of mining, etc. to better match 'sustainability', a value that we prioritised, as it was an important reason to start this project.

SOCIETAL VALUE(S) AND ECOLOGICAL VALUE(S)

We see that more of our students wish to direct their efforts towards the benefit of humankind and/or our ecology: social design and design for sustainability are gaining popularity. Within this context, social value, public value, and ecological value are of key importance; students are interested in addressing issues such as inequality, littering, and animal welfare. We feel that the practice of explicitly considering societal or ecological value(s) arises from an awareness of our interdependence with each other and our ecologies. However, doing so requires deeper reflection on the effects of our design outcomes than we are used to, and thus calls for greater critical reflection on the artefacts that we have become attached to in the act of creating. In our course, we teach our students to define a broad range of indirect and often unintended stakeholders and to assess how societal and ecological value(s) are affected. The terms encapsulate the manifold values of anyone, or anything (non-human) potentially affected by the design 'now and here' but also 'there and then'. When considering these stakeholders, we adhere to the mediation approach, where stakeholders are defined as roles in relation with the design, not as individuals or entities (Friedman & Hendry, 2019). One individual or entity can have different roles and a role can refer to multiple individuals or entities. For example, an individual can be a user, but also a neighbour in a different context.

STAKEHOLDER PROMPTS

Taking a broader view on stakeholders to include indirect stakeholders can improve the general 'goodness' of design outcomes. The 'stakeholder prompts' outlined by Bowles (2018) can be used to detect indirect stakeholders in the design process. Some are already formulated as having roles. Others are not, but can be further specified and reformulated into roles in relation to the design – e.g., a company can be a specific supplier of something like knowledge.

Stakeholder prompts: Individuals. Companies. Professional organisations. Unions. Governments. Militaries. Terrorists. Criminals. Workers. Managers. The unemployed. Minorities. Citizens. Voters. Hackers. Children. Future generations. The earth. Animals.

To improve our design outcomes, we can reflect more carefully on – and actively inquire how – they benefit or harm stakeholders. While the uses of a design beyond those intended by its designers lead to unintended consequences (e.g. spreading fake news more easily, buying many houses to rent them out to tourists, or, on a more positive note, hacking mass manufactured furniture so it becomes more personal), externalities concern the effects that fall on those that do not directly interact with the outcome (e.g. people who start to believe the fake news spread by social media users who they see as authorities and start to live by it and are harmed as a result, the neighbours who now have to live next to partying tourists who come and go, or again, more optimistically, visitors who enjoy the creatively beautified hacked furniture). A broader consciousness of the consequences and externalities of our designs on more stakeholders than users and organisations can result in a sense of responsibility for effectively responding to those consequences and externalities – that is, responsibility for mitigating any harmful effects and finding ways to benefit more stakeholders. To enable students to uncover the effects of the existing product-service system and opportunities for improvement, we provide the value map of Bocken et al. (2013) in our course. After mapping the value captured, missed, destroyed, and wasted of the existing PSS, they are asked to come up with suggestions to modify the value proposition in ways that could create and capture additional value.

Participatory design offers an approach to invite a broader set of stakeholders to actively engage in the process. In doing so, it prevents designers from unintentionally neglecting the values of those not involved, which could potentially remove or even destroy value for those left out of the process. However, there is no framework

VALUE-MAPPING

Value-mapping is a method aiming to map value for different stakeholders to discover points for improvement for the design outcome (Bocken et al., 2013). The tool adopts a multiple stakeholder view of value and introduces value destroyed or wasted/missed, in addition to the current value proposition and new opportunities for value creation. In contrast, value missed is untapped value potential and can be regarded as waste, but it is not directly considered harmful.

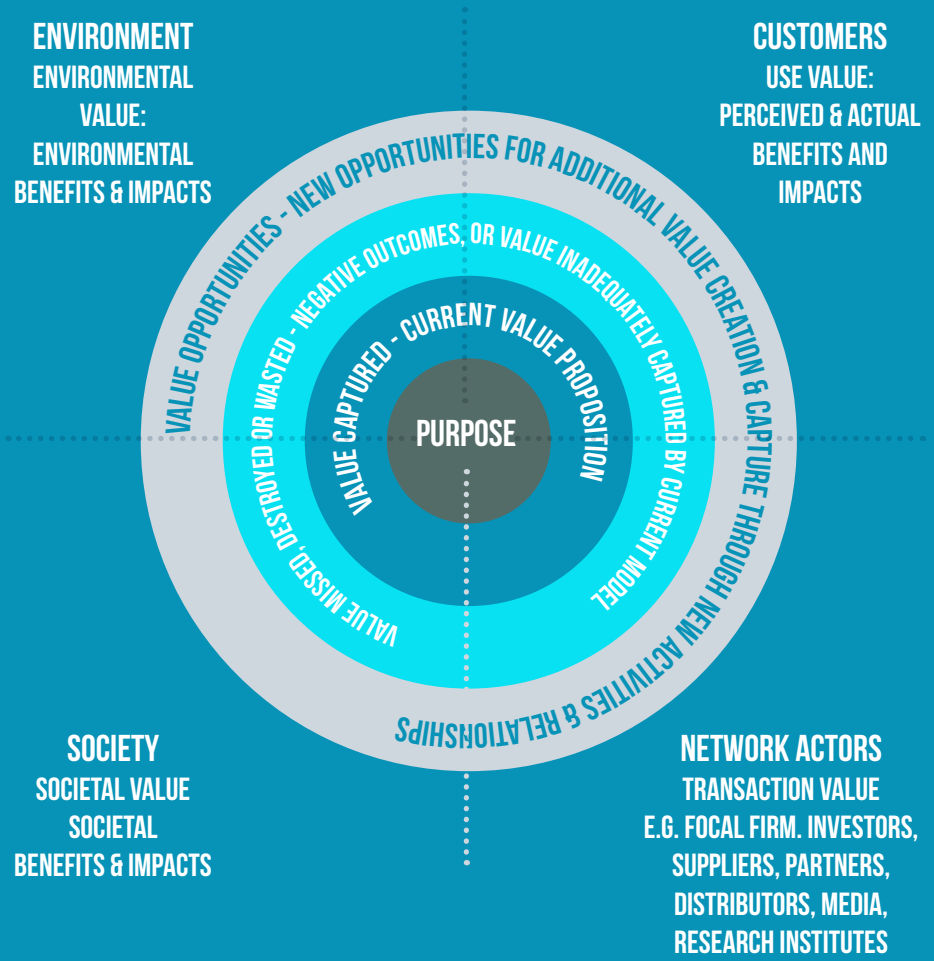

Figure 3: Simplified value mapping tool by Bocken, Short, Rana & Evans (2013). Diagram by authors.

to decide who or what to include in a design process, or how to weigh differing stakeholder values and deal with value tensions. For example, we can choose to maximise happiness for the majority or rely on deontological ideas, such as fairness, to better address the oppression of minorities. A deeper knowledge of theories of ethics and moral values can assist us in making more guided decisions in this context, and as such should be considered an integral part of design education (Tonkinwise, 2004; Roeser, 2012).

7. DESIGN AS APPLIED ETHICS

> ***'Ethics is not another equation to be solved which would be a sad, solutionist point of view that would ignore the most important parts of ethics: dialogue, consensus, resolve',***
>
> Cennydd Bowles (2018).

MORAL VALUES AND DESIGN

Intrinsically connected to human values, moral values can be defined as a system of values and principles of conduct, which determine what is the right and what is the wrong way to behave (Haidt & Kesebir, 2010). Moral values and judgements about the morality of an action or decision are closely related to 'ethics' and in practice are often used interchangeably, although moral values refer to personal guiding principles and ethics to a set of rules or actions. The moral values of the designer influence decisions in the design process, which have important consequences in terms of the extent to which a product, a service or a system serves and/or harms direct and indirect stakeholders. Individual moral values generally evolve as individuals reason about why they consider a certain behaviour acceptable or not. Correspondingly, ethical standards in society also evolve as its members slowly develop conventions and laws are put in place. As a result, designers cannot rely on existing ethical standards and laws to only define right and wrong behaviours. Designers often deal with the new, which by definition has often not yet been regulated – and even in regulated domains, there may be grey areas that are left to the interpretation of the designer. In addition, due to the complexity of global ecosystems, designers need to deal with differing regulations, situations in which current regulations might be influenced by economic stakes rather than morality, or even activities that in one country are perceived as immoral and illegal but are unregulated in another (e.g., child labour in the supply chain).

CONTINUOUSLY REFLECTING ON VALUE TENSIONS AND WRITING OWN CODE OF ETHICS

In addition to complying with existing laws, designers must rely on their own moral judgement when they decide to take up a project and when they make decisions in the design process. However, according to Haidt (2001), a moral judgement rarely results from conscious moral reasoning but is often the outcome of quick, automatic evaluations where social and cultural influences play an important role. This obviously creates biases and causes the designer to overlook the negative consequences and externalities of their design project. To avoid such situations, moral values should be consciously incorporated into the design process, as is suggested by the ethical cycle of van de Poel and Royakkers (2007). Moreover, as part of our course, students are asked to continuously reflect on their own moral values and to make several iterations of a personal code of ethics. By engaging in dialogues and evaluating an existing product-service system, we assume that they will encounter many value tensions. We ask them to keep track of the value tensions they experience, to reflect on them, and to draft rules on how they intend to be, make decisions, or act in the future.

To get more inspiration for a code of ethics, we will invite alumni from diverse fields to visit at the end of the course and ask them about the value tensions they have experienced in the past. We ask our students to carry out the interviews and look for habits, skills, values, and character traits that they feel can inspire their own code of ethics. This idea is based on virtue ethics, which considers the overall moral character of actions, according to which focusing on being virtuous leads to good behaviour. Virtue is a way of living that enables human flourishing – it can only be learnt by experience, but moral exemplars can be used as inspiration for performing good behaviours (Vallor, 2016).

THE IMPORTANCE OF REASONING IN DIVERSE TEAMS IN MORAL DELIBERATION

A code of ethics can serve as a compass, but most moral questions do not have a straightforward answer that can be captured by a rule. Value tensions are often difficult to resolve in practice and have their own context. Therefore, learning how to engage in high-quality dialogues is essential in the process of addressing ethical issues. This means that our course must pay special attention to teaching students to interact in high-quality dialogues. Values are felt as part of someone's personality, and when we feel our values are questioned, we tend to become defensive and even emotional, which can hinder the quality of these dialogues. The aim of a dialogue is

to uncover the beliefs that lack reasoned support (Bohm, Senge, & Nichol, 2004); values can be considered to belong to this category in the sense that they may be sustained by feelings and past experiences more than by cognitive, reasoned support (Maio, 2016). As people discuss and analyse the reasons for their values, they might develop novel thoughts, which, depending on the situation, may be more or less supportive of their existing values, or cause changes in their value priorities or value conceptualisations. We will offer students various forms of group dialogue to experiment with, which will be facilitated by our coaches.

RULES FOR ENGAGING IN A DIALOGUE

These rules are inspired by the work of David Bohm and Myrna Lewis to improve the quality of dialogues. The coach sits in and reminds the students of the rules when needed. The coach actively asks for other/new perspectives.

- Set your mind free: No collective decisions are made on what to do or what is the absolute truth about anything
- Everybody is equal: Nobody has a monopoly on the truth
- Be inconsistent: It shows you're learning, which we consider to be a good thing
- Suspend judgement: Everybody shares ideas. 'Neither believe them nor disbelieve them; don't judge them as good or bad.' Reflect on the effect it has on you and how it helps you to uncover new ideas or to let go of 'old' ideas that don't serve you well
- Be constructive: Try to build on other ideas. Show others you're listening by explicitly integrating perspectives
- Be as honest and transparent as possible: don't hold back ideas

In addition, we invite students to exercise moral imagination to extend moral argumentation. Designers then imagine various future scenarios for their designs and morally assess their consequences for a broad range of stakeholders. For example, they imagine how their design could be hijacked and the potential consequences of abuse. This assessment should, if needed, lead to the redefinition of the value proposition. It is important to note that moral imagination should preferably be broadened in a diverse design team (Bowles, 2018; Monteiro, 2019). By having an open-minded team with various backgrounds, the team gains broader perspectives,

and ethical issues can be raised more rapidly. Using the ethical cycle (van de Poel & Royakkers, 2007) can help students to redesign the existing value proposition of the product-service system to increase moral acceptability.

THE ETHICAL CYCLE

The ethical cycle (van de Poel & Royakker, 2007) is a process in which the formulation of the moral problem, the formulation of possible solutions, and the ethical judging of these solutions go hand in hand to reach a morally acceptable decision.

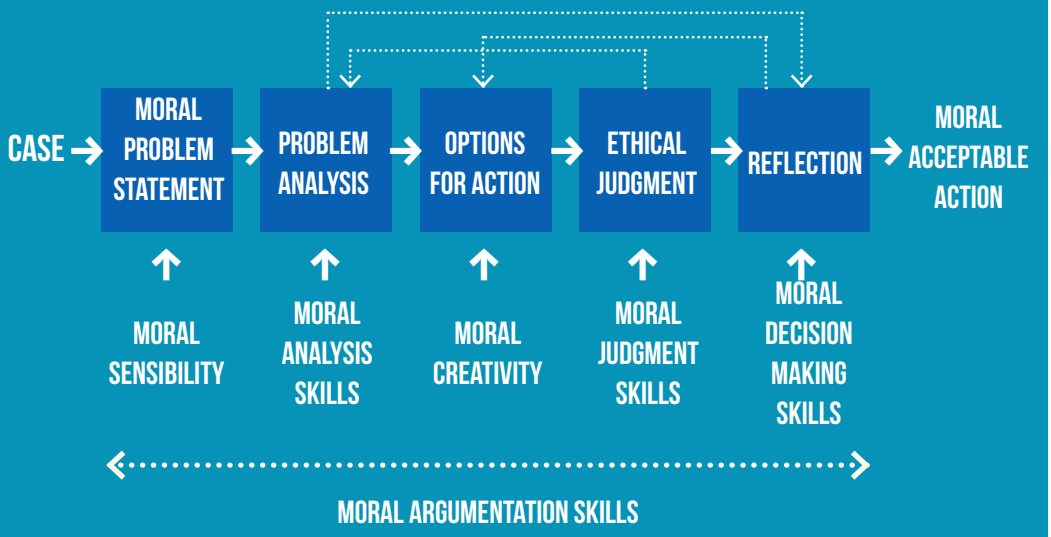

Figure 4: The ethical cycle based on Van de Poel & Royakkers (2007).

AND AFTER THIS COURSE?

Even when a decision is deemed unethical or immoral, it is often asked whether designers are in a position to say 'no' or even ask 'why?' Refusing to participate in a design project can have serious consequences for the designer, such as losing their job or being passed over for promotion. It is therefore tempting for designers to fall back on the saying, 'If I don't do it, someone else will'. Monteiro (2019) argues that design professionals should thus form unions, which would protect them in case they refuse a project that violates the ethical standards of the profession or even punish them when they act against these standards, as is common in other professions. Such examples can be found in medicine with the Hippocratic Oath, in journalism with the Charter of Munich, and in law. Such a shared code of ethics would need to be open, and all professionals should be able to openly contribute. Yet, design manifestos have been created in the past without leading to major changes in the profession and, as mentioned before, even if such a code is strictly followed, it would not give straightforward answers to all questions.

8. CONCLUSION: THE INDUSTRIAL DESIGN ENGINEER AS A SENSITIVE AND CREATIVE ORCHESTRATOR OF VALUES

Due to the ever-greater interconnectedness of our world, the consequences of our actions have become more and more far-reaching. By going beyond the consideration of the obvious and direct stakeholders, we aim to raise awareness about the fact that while you may create value for some stakeholders, others might suffer. In other words, taking this course may enable designers to acknowledge that no design is purely good, but always comes with consequences and externalities that are undesired by someone or something, somewhere, at a certain point in time. This represents an important change in design education, which used to be focussed almost solely on the value for the user and the organisation commissioning the design work.

We encourage our fellow teachers to trigger reflection on values using the theories and tools presented in the chapter. It is important to inspire conscious and explicit thinking about the values of the actors initiating and involved in the design process, and to acknowledge the tensions that might exist. Stimulating students to conduct high-quality dialogues between these collaborating actors might help them resolve these tensions while making them more aware of their own values. Reflecting on how a design creates value for some while it destroys value for others will inevitably lead designers to make decisions that involve their own moral values.

It is thus important for aspiring designers to reflect on their moral values, on what is ethical or not. On the one hand, this will enable them to initiate design projects that are morally meaningful to them. On the other hand, this will also enable them to refuse to design projects that conflict with their own moral values.

Finally, it is important to acknowledge that teaching students to understand values is challenging. Values and value are intertwined, and it is therefore difficult for students and even teachers to articulate the relations and differences clearly. It is also a topic that students might find difficult to comprehend because value and values are abstract. Consciously thinking about values requires a capability to engage in a high level of reflectivity, which not all students might have acquired yet. It is therefore important to let them apply these concepts in real-life cases. For example, in our course, we ask them to analyse the values supported or hindered by a product-service system, how it brings or destroys value for a broad range of stakeholders. We also ask them to reflect on their (moral) values and to propose an improved value proposition for the PSS. While it is important to introduce these concepts at an early stage in design education, they will not resonate equally with all students. It is therefore key to train students to adopt this lens on values in other projects across the whole curriculum. By doing so, this approach will become part of their DNA by the end of their design education, and the new designers will be better equipped to address the societal and ecological challenges of our time.

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TU DELFT STUDENTS' MIND MAP. PHOTO BY R. ROCCO.

tools

representation

skills

drawing

2D

computational (render skills)

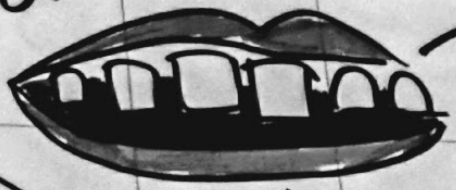
rapid prototyping

photography

presentation making

communication

bla bla bla



Skills

social interaction

love, hugs, friends & sex

professiona / values

"purpose of life"

what the world

SECTION

2

TOOLS

TU DELFT STUDENTS' MIND MAP. PHOTO BY R. ROCCO.

'THE PRACTICE OF TAKING A POSITION TOWARDS THE WORLD': DESIGNING MANIFESTO WORKSHOPS

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ABSTRACT

This chapter shares a manifesto workshop as a pedagogical tool to work through and work towards ethical built environment values. The paper is structured according to a series of exercises which invite students to: learn from diverse and divergent perspectives; develop a position towards them; formulate a critical reflection; draft their own declaration; and rework it into a collective response. At a time of climate breakdown and biodiversity loss, systemic social injustices and growing inequalities, this workshop asks questions of built environment pedagogy and practice. As students progress through the workshop exercises, they negotiate and nurture concepts and approaches essential to developing ethical practice, from positionality and situatedness to reflexivity and relationality. To explicate these terms, I call upon the work of key thinkers D. Soyini Madison, Felicity Scott, Farhana Sultana and Penny Weiss alongside the Bartlett Ethics Commission led by Jane Rendell.

ETHICS, POSITIONALITY, SITUATEDNESS, REFLEXIVITY, RELATIONALITY

INTRODUCTION

I would like to begin with an exercise. On your seats you will find a sheet of discordant poetry, a chorus of values, each stanza composed from the manifestos of different architects, artists, and activists.

I invite you to each contribute to this exercise with your voices. I would like us to read every line together like a devoted congregation following a performance, or at prayer, or in protest. Ready? I will keep time. An' a one, an' a two…

In this chapter I share a manifesto workshop as a pedagogical tool that develops an ethical ethos to underpin built environment practice. I propose that debating, drafting, and declaring manifestos creates, as designer Corinne Gisel (2016) puts it, a certain disturbance in the curriculum to think otherwise. This thinking otherwise permits critical reflection on the range of consequential and often contradictory values espoused by built environment practitioners in order for students to articulate their own values and imagine the practitioner they seek to become.

The paper is structured according to the series of workshop exercises I have developed for MA and MArch programmes in UK and Danish architecture schools. In italics beginning each chapter I introduce the instructions for these six exercises which are followed by practical and theoretical reflections. The exercises invite students to: learn from diverse and divergent perspectives; develop a position towards them; formulate a critical reflection; draft their own declaration; and rework it into a collective response.

As students progress through the manifesto workshop, they negotiate and nurture concepts and approaches essential to developing ethical built environment practice, from positionality and situatedness to reflexivity and relationality. To explicate these terms, I call upon the work of key thinkers D. Soyini Madison, Felicity Scott, Farhana Sultana, and Penny Weiss alongside the Bartlett Ethics Commission led by Jane Rendell which explores built environment ethical issues and provides tools for researchers and practitioners to teach themselves how to identify ethical dilemmas, negotiate their ethical responsibilities, and rehearse strategies to navigate unpredictable situations with care and creativity.

EXERCISE 1: MANIFESTO CHORUS

...an' a one, two, three, four:

[Architecture must] always be an exploration not a confirmation
(Alsop, 1993)

not a tool for imperialism and subjugation, not a means for aggrandizing the self,
but a vehicle for liberation and joy
(Black Reconstruction Collective, 2021)

I am not willing to get over histories that are not over
(Ahmed, 2017)

The architect's job is not to propose ideal models for society,
but to devise spatial equipment that the citizens themselves can operate
(Kurokowa, 1977)

Everyone should be able to build.
We must face the risk that a crazy structure of this kind may later collapse,
and we must not shrink from the potential loss of life
(Hundertwasser, 1958)

Architectural education must be as much about unbuilding as building
(BREAK//LINE, 2018)

We build connections, conduits, channels, tentacles, and rhizomes,
converting and repurposing structures of power
(FAAC, 2018)

Expressive awesomeness!
(Jones-Hogu, 1973)

Any new building ought to commemorate the nature
that had to be destroyed because of it
(Hasegawa, 1991)

No one is participant only or designer only.
As people work together to heal their places, they also heal themselves
(Van de Ryn and Cowan, 1995)

We affirm our will to act to change the capitalist and patriarchal world
which puts the interests of the market before the rights of people
(Nyéléni, 2007)

Art is the practice of taking a position towards the world
(Azzawi, Al Turk and Al-Nasiri, 1969)

The manifesto chorus ushers in an unexpected atmosphere. The studio hush is broken with hesitant speech, skittish laughter, and furtive smiles as students accustom to a class which calls upon their voices and compels them to speak to the depth and range of issues and positions that inform architectural inquiry and practice. This first exercise is an abrupt introduction to a different way of being and learning together and, as such, may require some calming and coaxing, enthusiasm and encouragement to build participation.

This paper draws on my work as part of the Bartlett Ethics Commission, which seeks to expand understanding, raise awareness, and collectively develop approaches of ethical practice targeted to built environment researchers and practitioners. To help develop ethical attitudes and aptitudes, Jane Rendell, Yael Padan, and I have designed an open-access pedagogical toolkit that balances the instructive and reflective (2022). This includes a lexicon of core ethical principles and approaches, a set of case studies where researchers work through a process to reflect on ethical dilemmas that arise in specific situations, and a suite of guides targeted to research methods that follow the process of realising a project offering tailored advice at all stages.

This manifesto workshop builds upon these activities to elicit a different form of ethical reflection. To set out how the debating and drafting of a manifesto correlates with skills and approaches of ethical practice, I draw from two recent articles (Castan-

Figure 1: Workshop for Fast-Forward Feminism, University College London. Miranda Critchley and David Roberts, 2019. Photo by author.

Broto et al., 2020; Roberts, 2020). Whereas art and architectural historians focus on the language, medium, movement, and impact of manifestos, in these articles I shift attention from proclamation to process, arguing that the act of drafting a manifesto involves both working through and working towards ethical principles and situations.

Rather than 'a simple command or a definition', art historian Mary Ann Caws (2001, p. xxvii) describes manifestos as 'an exhortation to a whole way of thinking and being.' 'The manifesto moment,' she distinguishes, 'positions itself between what has been done and what will be done, between the accomplished and the potential, in a radical and energising division' (ibid, p. xxi). In the edited anthologies of architectural manifestos, theorists are particularly attuned to this positioning. In terms of the what has been done, Mark Wigley (2015, p.156) suggests 'Manifestos are layered on top of each other, and each of these layers has its own precise history.' This builds upon the work of Beatriz Colomina (2015, p. 41) who states 'Every manifesto is a reworking of previous manifestos… That is what architectural discourse is all about – an exchange of manifestos.' Writing a manifesto is a relational act of working through, a personal accounting as authors respond to the principles and practices set out by others in relation to contemporary forces.

In terms of what will be done, 'The manifesto precedes the work' posits Colomina (2015, p. 41), 'It is a blueprint of the future.' Craig Buckley (2015, p. 22) defines this as 'a special type of relay, one that transmits such urgent signals forward in time, but which also encapsulates the past's claims on the future, in words and forms that aim to be the barometer against which some future present will take its measure.' Writing a manifesto is also a working towards, a reflexive relay which not only reflects but projects as a directive for future acts.

These relational and reflexive acts correspond to approaches of ethical deliberation and imaginative identification. Working between principle and situation, the positional and the potential propels manifesto authors to explicate why this practice is necessary to address the challenges of the now. In doing so, Wigley (2015, p. 153) characterises 'Manifestos conjure whole worlds. A manifesto never simply appears in our world. It is a polemical document thrown into and against our world. There is always a violence to the throw. One world hits another.' To draft a manifesto is a political and embodied act, and in this workshop, we express this active state through recitation – not a passive reading but active reproduction of the written word. Yet, as with all things politics embodies it can too easily lead to war: Colomina (2015, p. 59) claims 'A manifesto requires destruction of history.' Wigley (2015, p. 163) bangs the table in agreement 'A manifesto is a weapon.' Charles Jencks (1997, p. 2) shouts 'The genre demands blood.'

EXERCISE 2: MANIFESTO CHORUS ENCORE

Now that you have read these manifesto extracts, tested how they feel on your tongue, heard how they sound in your colleagues' voices, please pick up those sheets again. We will perform this chorus of values one more time. Rather than read every line, this time I would like you to only read the lines with which you agree – the ones which make your spirit lift and your heart race. There are twelve in total. You may agree with just one, or a few, or all of them, though if you do, I would be a little worried about your internalised contradictions!

I will keep the pace. As we go through, join me loud and proud when you want to give your voice in agreement, or stay silent to disagree.

The studio swells and stills as students give voice to certain values or fall quiet. It is never easy to predict what agendas students will align more strongly with. This exercise takes inspiration from art collective Freee, who encourage students to negotiate

Figure 2: Workshop for Critical Written Reflection MA Architecture students, Aarhus School of Architecture. Tine Nørgaard and David Roberts, 2017. Photo by author.

their position towards each word, phrase and principle. Comprising Dave Beech, Andy Hewitt, and Mel Jordan, Freee use manifestos, sculptural kiosks, spoken word choirs, and the 'bodily endorsement of slogan' in an attempt to form a community forged in dialogue through the declaration of agreement and disagreement, seeking to reinvigorate manifesto writing as a practical tool for collective political engagement (Jordan, Beech, & Hewitt, 2015).

Manifestos have played a powerful role in architecture and urbanism over the past century. Colomina (2014) argues they are 'the site of self-invention, innovation, and debate,' where 'even buildings themselves could be manifestos.' As well as 'an indispensable vehicle for setting transformative architectural projects in motion, Buckley (2015, p. 6) warns how manifestoes 'have also been associated with some of the more problematic elements of such vanguard positioning, from hyperbole, exhortation, and naïveté to misogyny, racism, and sympathies for fascism.'

Looking across the array of manifesto compilations, architectural theorists can become so swept up in the selective histories, forceful enumerations and epigrammatic style of canonical examples, they repeat these self-referential rhetorical traits when examining the genre. Felicity Scott (2015, p. 122) singles out Jencks as characterising manifestoes in terms of 'an emotionally charged, even biblical crusade bent at once on destruction of an enemy or outsider, the exclusion of difference, and the establishment of new orthodoxies.' She condemns his belief that it is 'The irresistible display of violence and strength which makes the manifesto memorable and psychologically impressive' as foreclosing critical potentialities (ibid.).

The authors of two recent global manifesto anthologies challenge these limited conceptions. In *Why Are We 'Artists'?: 100 World Art Manifestos*, critic Jessica Lack (2017, p. xiii) describes 'a delusion in the West' that the manifesto has 'long outlived its finest hour.' For Lack, the manifesto is a reminder of the privilege of who has been able to speak in spheres of public exchange and who has been excluded. Indeed, a recent survey of 110 architectural declarations in as many years includes only five examples from the Global South (Leeuwen & Eykemans, 2014). The manifesto also 'opens up the space through which marginalised voices and experiences can attempt to make the voice of their diversity heard' (Lack, 2017, p. xiv). To read from Lack's compendium alongside political scientist Penny Weiss' *Feminist Manifestoes Global Reader* (2018), is to listen to previously silenced stories in myriad political contexts, learn tactics to undermine colonialism and censorship, forge solidarity and collective identity.

There is an ethical imperative to moving beyond architecture's Western-centric bias, the narratives and theories it perpetuates. The ground-breaking open-access curriculum *Race, Space and Architecture* addresses how understandings of race-making might be extended through imagined and constructed forms of architecture. Huda Tayob, Suzanne Hall, and Thandi Loewenson (2019) explain how many of the sources and inspirations come from beyond what is typically considered the discipline of archi-

tecture: 'This is an important part of unsettling the disciplinary conventions of what architecture is, how it can be taught, and how architecture's on the ground impacts and future possibilities can be understood.'

Since architectural manifesto compilations can be rooted in and tethered by Western modernist narratives, in this workshop I draw from Lack and Weiss' manifesto anthologies to put students in relation to different histories and consider alternative visions and values. This act encourages students to confront their positionality. Anthropologist D. Soyini Madison (2005, p. 14) considers positionality as vital, 'because it forces us to acknowledge our own power, privilege, and biases... When we turn back on ourselves, we examine our intentions, our methods, and our possible effects.' As students negotiate this expanded vocabulary of examples and possibilities, these exercises begin to cultivate an ethical built environment practice open to different voices and ways of seeing.

EXERCISE 3: REIMAGINING A MANIFESTO

It might be obvious by now, but over the course of this workshop I want you to each write a manifesto. To ease you into this, I would like you to begin by situating yourself within an existing one.

For this exercise you will take the words of a pivotal architect and reimagine them. This fistful of pages comprises photocopies of 50 different architectural manifestos from the last century. Each of you will receive one. I invite you to read the one you have been given carefully and then to alter it to express your opinion on it. Keep in the words and sentences with which you agree, and cut out, burn through, scratch out, draw over, black out, paint over the rest of the text to make it speak to you.

We will begin by sharing excerpts of your assigned manifesto between us. Please explain the author, their context and your rationale for drawing our attention to certain lines. In small groups, discuss the ways in which you may reimagine, manipulate or subvert it verbally and visually.

In two hours, we will pin up your reimagined manifestoes, recite, and reflect upon them.

Groups of students huddle over their desks. Rather than fixed historical documents, photocopies of manifestoes transform into arenas in which to act. 'The art of making manifestos is also the art of appropriation' Alex Danchev (2011, p. xxv) states, and students take his words to heart as they seek to define themselves against their assigned predecessors. In a studio, anything can be intervened into. Thick impasto

Figure 3: Walter Gropius' What is Architecture? manifesto reimagined. Alexandra Niemi Olsen, 2017. Printed with permission.

smears of acrylic transform Walter Gropius' impassioned modernist manifesto (1919) into an expressionist action painting. But rather than take an oppositional stance to destroy their rival, as Jencks may put it, students constructively critique, collaborate, and conspire with their manifesto authors. The kaleidoscopic strokes and smudges of Gropius' reimagined manifesto seem to distil and democratise his ideas, urging us all to build 'fairy tales of colour… unconcerned with technical difficulties.' As students

question manifesto orthodoxies to forge their own wayward versions, they take up Scott's challenge to redefine the genre and recover the possibility of a manifesto to operate otherwise (2015).

This exercise encourages students to research the situation of a manifesto and consider their own situatedness as they respond to it. In her global reader of feminist manifestoes, Weiss (2018, p. 2) cites the work of Aida Hurtado (2003) and Kathi Weeks (2013) to consider how these manifestoes invent new methods and forms to subvert racist, heterosexist, and imperialising language and let the 'other' speak, whether through indictments, oaths, letters, or a set of demands: 'This suppleness both allows different voices to find expression and permits the document to reflect its 'embeddedness in a particular time and place.' This attention to embeddedness in time and place is a vital aspect of ethical built environment practice.

Rendell (2020) describes a situation in both spatial and temporal terms – its location in space alongside its conditions of a particular instant, a moment, or an event. Drawing from key feminist thinkers from Nancy Hartstock and Donna Haraway to bell hooks and Seyla Benhabib, she explains how our social location affects not only what but how we know. Rendell (2022) urges practitioners to attend to the material, political, and emotional qualities of their subjectivity and the ways in which they are positioned and situated with respect to their practice. A situated approach to built environment practice requires practitioners to address the particularities of the sites in which they are intervening and consider their position and location in relation to those sites. To intervene in an existing manifesto, as this exercise instructs, requires students to address their position and location in relation to both the situation of their assigned manifesto in the past and the situation of their design studio in the present.

Figure 4: Workshop with MArch Architecture students, Central St Martins, 2020. Photo by author.

EXERCISE 4: WRITING AN INDIVIDUAL MANIFESTO

So far, we have examined and reworked other people's words to articulate our values. I would now like you to draft your own manifestos. As I said, this is hard! So, we are going to take it one line at a time.

You might begin with a line from one of these manifestoes as a propositional starting point. If, like me, you feel frustrated or constricted by them, they underscore the importance of finding new adventures in expression.

Or you might begin with three short sentences. The first, declaring an opinion – why do you need to act. The second, a vision – what world do you seek to build. And the third, an approach – how will you get there. As Penny Weiss (2018, p. 3) notes, a good manifesto has three elements: 'it reveals and criticises an unjust status quo'; 'it offers visions of more egalitarian, respectful, democratic communities'; and 'it addresses strategies for bringing about change.'

Write each line of your manifesto on a different coloured post-it note and collate these to read aloud in one hour.

The studio falls silent again. An array of polychromatic and polyvocal values on post-it notes gradually sprinkle the table. This is the hardest task for students to grapple with as they seek to articulate in their own words what they support, stand for, and wish to see in the world. In the first class she teaches, designer Suzanne Martin litters the room with flyers and posters as if protestors had charged through the studio. Each expresses the same manifesto lines, including 'If you don't try, you'll never know,' 'If you don't ask, you'll never get,' which Corinne Gisel (2016, p. 36) sees as 'a statement for self-empowerment and self-education,' a prompt for students to think about their own identities, opinions and goals. Martin's class progresses with short questions in which students have thirty-seconds to respond on a post-it, such as 'What are five keywords that describe you,' after which students each write their own manifesto. This assignment prompts students to think reflexively about their own education and their own career, to vocalise their own processes and ambitions, to shape their learning environment and take charge of it.

If manifestos, as Bernard Tschumi (1978) reminds us, 'resemble contracts that the undersigned make with themselves and with society' then it is vital that practitioners look both inward at their identity and outward to their wider impact. Geographer Farhana Sultana (2007, p. 376) argues this process is an essential component of ethical practice: 'being reflexive about one's own positionality is not to self-indulge but to reflect on how one is inserted in grids of power relations and how that influences methods, interpretations, and knowledge production.' The challenge of negotiating and articulating criticisms, visions and strategies in these workshops to may act to catalyse this process, but Marilys Guillemin and Lynn Gillam (2004, p. 275) remind us that reflexivity involves a 'continuous process of critical scrutiny and interpretation' in relation to method, content, positionality and context.

Reflexivity is particularly important for built environment practitioners. Kazys Varnelis (2009, p. 156) advocates for architects to practice reflexivity as a means to actively negotiate the complexities of the world:

> *This does not entail the abandonment of the possibility of either making a comment on, or changing some aspect of the world through architecture. On the contrary, reflexive practice insists on it. Architects, especially the best architects, are hired to do things differently. They are hired because of their capacity to dream, to create breakthrough ideas, to re-imagine the world and make it new again. Reflexive practice does not mean 'going with the flow.' It means operating in the system, but changing it.*

EXERCISE 5: NEGOTIATING A COLLECTIVE MANIFESTO

We move to our penultimate task. From your beautiful individual declarations, might it be possible to make a collective manifesto that speaks to us as a group? I would like us to begin by discussing the principles and purpose of our collective manifesto. What actions can we scale to our group? Should it express dissensus as well as consensus? Could it attend not only to our situation but a constellation of other histories and lived experiences?

Next, let's work through your own declarations. Each line of yours is written on a different post-it. I've divided the wall into three vertical sections. As the exercise progresses, we will move from right to left. Can you please stick all your post-its up on the right-hand side at random. We will discuss each line in turn and, if it speaks to us, move it to the middle, if not, we will leave it behind. Please don't take this personally as we negotiate your contributions! We are thinking about how each of the lines relate to each other and to us as a group.

While in the middle section, we will consider whether to redraft each line, whether it overlaps with or contradicts any others, and if indeed this repetition or difference is important to include. Only the agreed upon lines will be added to the left-hand side, where we will order them to formulate our collective manifesto.

The studio space fills with voices again. Each line is scrutinised as students consider how to best proclaim their shared concerns and beliefs. Post-it notes steadily migrate across the wall. Cheers and cries erupt as pressing issues of injustice or aspirations for a more equitable, expressive, exuberant world are agreed upon or abandoned. The studio wall, usually a formidable site occupied by individual students in hierarchical design reviews, is transformed into a fertile site shared among all to devise mutual actions and articulations. Something else happens in this process. As students passionately advocate for their lines to be included, they witness each other declaring an intention to live up to these processes and promises. Rather than define themselves against their peers' words, they value what Julie Kristeva (1980) describes as the intertextuality of their different articulations, and the histories, interpretations, and ideological positions they represent. The studio becomes a community charged with anticipation as students take mutual responsibility to uphold these principles unexpectedly thrown together and held to account by their shared desires.

In their experiments in collective writing, Michael Peters, Tina Besley, and Sonja Arndt (2019, p. 34) draw from the principles of transversality set out by Felix Guattari (2015) to describe how collectives must work on the many different ways of working together, constantly renegotiating 'as a collective singularity constructed and reconstructed in the

collectivity of a multivalent collective project.' This ethical reframing of subjectivity has wider implications for the design studio. Richard Heraud et al. (2017) describe the act of collective writing as offering a possible way forward from the co-opting of academic activities by neoliberal economics, subverting an environment where competition rather than collaboration is prioritised. This is particularly important given the exclusionary, individualistic environments for learning that architectural education is known for, which as Bernadette Blair (2007) reminds us, particularly impacts marginalised people.

Figure 5: Workshop with Accelerate secondary school students. Amy Butt and David Roberts, 2022. Photo by Luke O'Donovan. Printed with permission.

The collective manifestos students produce in this exercise often include statements oriented around their responsibilities to one another as well as the wider world. In so doing, students address their relationality within and beyond the design studio. In her overview of the term, Yael Padan (2022) describes relationality as the understanding of social existence as networks of relationships between people. Padan sites relationality within the feminist theory of care ethics and cites the work of Virginia Held and Joan Tronto to explain: firstly, how the perception of persons as relational beings stands in contrast to that of dominant western theories of ethics which place the individual in the centre (Held, 2006); and secondly, how interdependent relational responsibilities draw attention to power asymmetries, as they are affected by the political, social and epistemological context in which they are practiced (Tronto, 2012). Weiss (2018, p. 2) identifies how this relational process of collectively writing manifestoes also has an important history in feminism. 'Collective authorship means that feminist manifestos not only inspire political action but also are the outcome of, or reflect feminist action—a diversity of voices, informed by experience and reflection and dialogue, together confronting enormous practical and theoretical problems… Collectively written manifestos help create feminist space and actors.'

Figure 6: Workshop for MArch Sustainable Architecture, Centre for Alternative Technology. David Roberts and Zoë Quick, 2019. Photo by author.

EXERCISE 6: REALISING A MANIFESTO

Thank you for your patience and passion. We have one final task. I would like us to consider how your manifesto will be realised. How can we keep it urgent and present? What are the barriers we perceive in enacting and embodying it?

I encourage you to pin up your individual and collective manifestos in your studio. Treat them like you would any other piece of work here: as living, evolving, dynamic, to be revised throughout the year to reiterate values, to reinforce intentions, to reconfigure according to shifting concerns.

Before then, all that remains is to crowd around your beautiful collective manifesto and read it aloud in chorus, in celebration of your stunning display of imagination and ideals!

In triumph and exhaustion, students speak in unison once more and break into applause. Some leave swiftly, others choose to stay and take further action. In one studio, co-conspirators gather around their manifesto for a photo, some standing, some kneeling. In another, the post-it notes are carefully compiled and displayed beside the door to flutter insistently whenever a student passes. In another, fragments of the manifestos are painted onto triangular banners to form placards chanted from and paraded through studios, lecture theatres and grounds, where they are planted to seed ideas across the landscape of the institution. All shrug off Wigley's (2015, pp. 170-171) lamentation for the future of the manifesto:

> *The strangeness of the manifesto-effect is lost when every architectural studio has a manifesto department or thinks of itself as a manifesto department. The manifesto is not something that can be commissioned. It has to be the uninvited guest. What is going on now is that the students of architecture are being invited to produce a surplus of manifestos in a kind of parody, a massive unwitting Dada event of countless manifestos being fired off in all directions, simulating thereby that they are still trapped within a modern paradigm that has no impact outside schools.*

By only focusing on the power of the proclamation not the process, the public impact not the personal, Wigley overlooks the possibilities for manifesto writing regardless of how widespread they are issued. In these workshops, I witness how students respond to the challenge of negotiating and articulating the practitioners they seek to become. I argue this act of debating, drafting and declaring manifestoes is an opportunity to introduce and develop positional, situated, reflexive, and relational approaches fundamental to ethical practice.

At a time of climate breakdown and biodiversity loss, systemic social injustices and growing inequalities, this workshop asks questions of built environment pedagogy and practice: how can we recast and reconceive architecture from the myth of the individual genius to the necessity of the collective; how can we develop skills of personal ethical reflection and interpersonal negotiation; how can we rehearse and model forms of cooperation; and how can we articulate our own ethical values and scale action to effect meaningful change.

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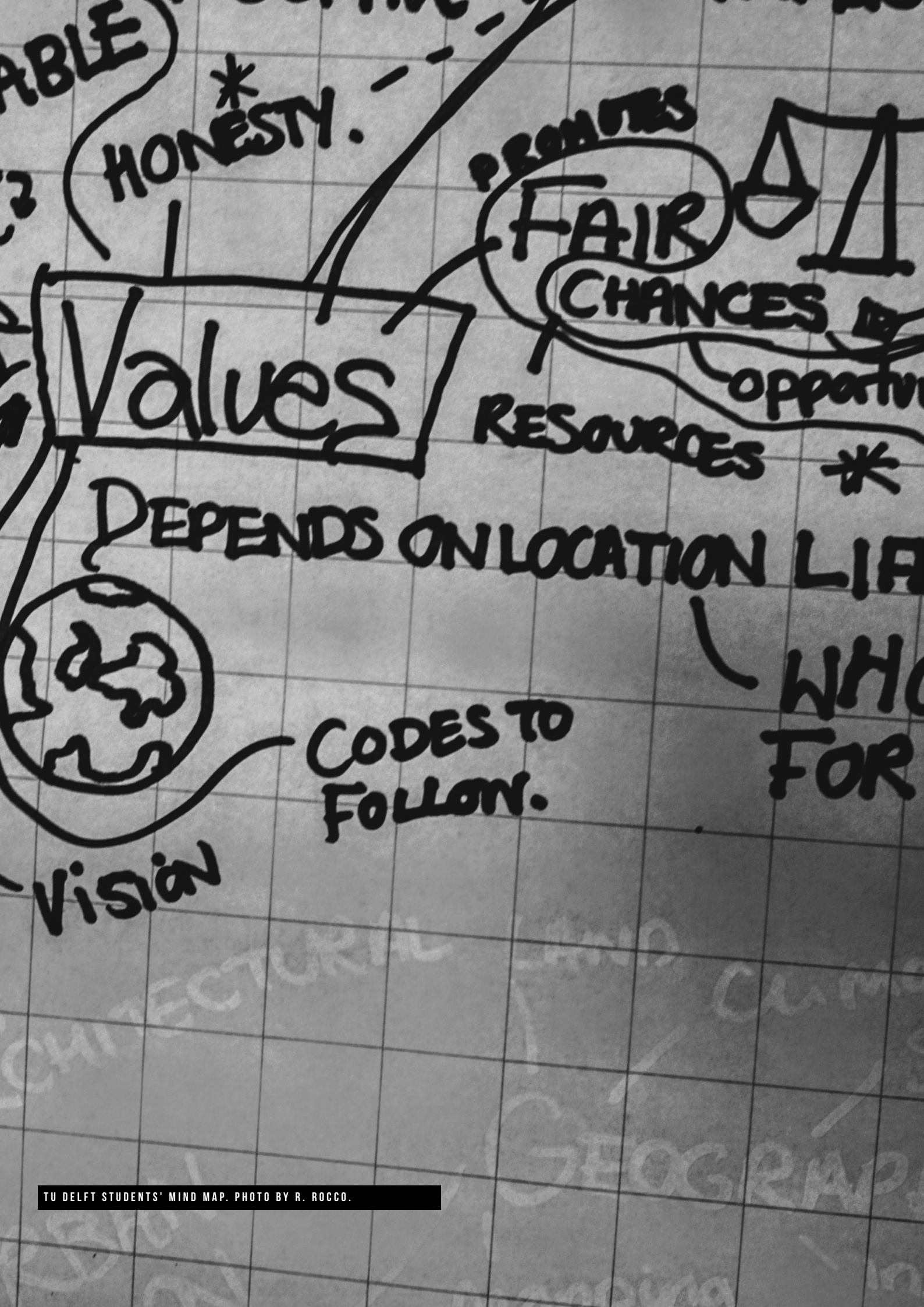

TU DELFT STUDENTS' MIND MAP. PHOTO BY R. ROCCO.

THE VASE PEDAGOGICAL FRAMEWORK: TEACHING FOR VALUES IN DESIGN IN HIGHER EDUCATION

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ABSTRACT

This chapter introduces and describes a pedagogical framework and resources supporting teachers in teaching for values in design. The pedagogical framework along with its teaching activities and resources was developed through the project Value Sensitive Design in Higher Education (VASE) to facilitate the development of knowledge, skills, and attitudes in students across the Humanities and Sciences that help them become more responsible designers. The VASE pedagogical framework is built around three core competency pillars reflecting the identified central dimensions involved in teaching for values in design: 1) Ethics and Values, 2) Designers and Stakeholders, 3) Technology and Design, and provides teachers with a curriculum compass, a collection of 28 teaching activities and 12 assessment activities. The chapter presents this work as an inspirational repository for all teachers to explore, experiment with and integrate in their teaching for values in design.

PEDAGOGICAL FRAMEWORK, TEACHING & ASSESSMENT ACTIVITIES, STUDENTS AS RESPONSIBLE DESIGNERS, PEDAGOGICAL DESIGN PATTERNS, OPEN EDUCATIONAL RESOURCES

1. INTRODUCTION

Teaching for values in design is currently gaining momentum as addressing ethical and social dilemmas is increasingly becoming a part of the learning goals in a growing number of university courses around the world (Hendry et al., 2020). This increased interest stems in part from ethical issues and scandals surrounding tech industries becoming more pervasive in the media and public discussions (Fiesler, 2020; Singer, 2018). However, as researchers, developers, and teachers within the field of technology and design, we find that educational resources and materials to support such teaching are still scarce, and that many teachers like ourselves face the pedagogical challenge of how to teach and make explicit the values perspective in the classroom.

To provide teachers with resources enabling them to educate students on these matters, this chapter presents a proposal for a pedagogical framework aiming at facilitating the development of knowledge, skills and attitudes that students need in order to consider the broader context and implications of design and design processes, and through this the possibility for them to become more responsible designers. The pedagogical framework proposed in this chapter can be used for:

- scaffolding students' value-sensitive knowledge, skills and attitudes and capabilities to work with values in design
- assisting teachers in how to teach students to become more responsible designers (a so-called double-pedagogical framework, teaching teachers how to teach for values)
- capacity building for higher education institutions by supporting institutions in educating responsible designers

The pedagogical framework was developed through the project Value sensitive design in higher education, VASE (2021a), which involves a collaboration between teachers, researchers, and educational developers at Malmö University (Sweden), Aarhus University (Denmark), and Eindhoven University of Technology (the Netherlands). The pedagogical framework (from now on referred to as the VASE framework) and the resources developed are offered as an open educational resource (OER), the VASE OER online platform (VASE, 2021), to teachers at different technology, design, and engineering programmes such as interaction design, information science, computer science, technology enhanced learning, educational technology, industrial and product design, or similar programmes, courses, and modules. The reason for targeting such a broad array of programmes and disciplines is because of the multidisciplinary nature of designing for and with values. Educating students to become responsible designers and supporting teachers in how to teach for this, is equally important for all engaging

with technology and design across the Humanities and Sciences. As such, the VASE framework targets the 'meso level' of teaching and learning resources, implying that it is neither a 'macro frame' for what values in design are and how they should be understood as a discipline, nor a 'micro activity' for how to teach within a specific curriculum. All in all, the VASE framework reflects the multidisciplinary fields of the researchers, developers, and teachers who came together to develop the framework and its pedagogical resources. As such, the hope is the framework will help people like ourselves integrate teaching for values in design in meaningful ways within their own diverse disciplines, programmes, and modules.

The VASE framework is built up around three core competency pillars reflecting the identified central dimensions involved in teaching for values in design: 1) Ethics and Values, 2) Designers and Stakeholders, 3) Technology and Design. It has seven overarching learning objectives. To help teachers navigate and plan a desirable learning pathway that fits their own education programme, we developed a curriculum compass, outlining core competencies to help students work towards becoming more responsible designers. The curriculum compass is on the 'meso level' and, thus, general enough to be applied across various forms of teaching design in higher education. Yet it provides a concrete and practical tool for teachers to navigate through a wide range of useful resources to identify specific teaching and assessment activities that fit their educational contexts and pedagogical aims. The goal is not to provide a full curriculum or courses on values in design, but rather an inspirational repository of various resources for teachers to explore, experiment with and integrate in their teaching based on their particular needs and settings.

The design of the VASE framework is rooted in previous research addressing the importance of creating an increased awareness of the role that values play in design, including initiatives such as value sensitive design (Friedman & Hendry, 2019), values in design (Nissenbaum, 2005), values at play (Belman et al., 2009), and values-led participatory design (Iversen & Leong, 2012). These approaches have been chiefly developed for research and development purposes, offering methods for designers to work intentionally and practically with values in their design practices. Here, the VASE framework adds yet another layer, namely the pedagogical perspective, and how we as teachers can create conditions for students to grow into responsible designers of future technologies.

2. METHOD: DEVELOPING THE VASE FRAMEWORK

We are witnessing an increased interest in teaching and learning about ethics and values in design (Fiesler, 2020; Singer, 2018). However, as a group of experienced teachers in design in higher education, we felt that the teaching resources on this topic are scarce and scattered, which is why we decided not only to develop practical teaching materials, but also to package them into a coherent pedagogical framework.

The development of the VASE framework is grounded on research and methods that combine desk research, teaching practice, educational design processes, pedagogical design pattern development, and peer-review shepherding to secure research-grounded, method-driven, and quality-assured activities for teaching for values in design. One of the core methods that we have applied in this development is the Structure of the Observed Learning Outcome (SOLO) taxonomy (Biggs, 1982). SOLO taxonomy is a five-tier hierarchical framework for structuring learning outcomes, which provides a general tool for defining curriculum objectives, intended learning outcomes, and evaluating learning outcomes. Each level in the SOLO taxonomy is represented by a set of verbs that can be used to formulate intended learning outcomes for each of the teaching activities, such as 'identify', 'describe', 'relate', and 'reflect'. These SOLO learning outcomes clarify the level of competency that is intended to be achieved through the teaching activity. To give a few examples, in the VASE framework, teachers will find learning objectives such as 'Students will be able to analyse, compare, and argue for how values are manifested in design', 'Students will be able to interpret, adapt and plan their design direction based on the identified designer and stakeholder values', and 'Students will be able to critically reflect on the evaluation of the design in terms of values'.

Overall, the development of the VASE framework was guided by the three-phased model for conducting educational design research and developing educational materials (McKenney & Reeves, 2012). Educational design research is a type of educational research aimed at providing concrete solutions to educational practitioners in relation to practical and complex educational problems such as how teachers can teach for values in design and educate students as responsible designers. Solutions can take the form of educational products, processes, or programs that both support teachers in their educational practice and seek to discover new knowledge that can inform future research, development, and practice within that domain. Below is a short description of the three-phased model:

PHASE 1) EXPLORATION AND ANALYSIS

Exploring the existing domain of teaching for values in design by conducting a literature review on (teaching and assessing) values in design and through this developing the research grounding of the VASE project presented in several desk research reports. Furthermore, the method of pedagogical design patterns as a systematic educational development method was introduced. This method was used to develop the concrete teaching and assessment activities such as Values clustering for developing value vocabularies, Constructing value-based design requirements, or Public examination of values on design that can be found on the VASE OER online platform (VASE, 2021).

PHASE 2) DESIGN AND CONSTRUCTION

Based on phase 1, three core competency pillars and seven overarching learning objectives were extrapolated and described. Then the SOLO taxonomy (Biggs, 1982) was applied to the pillars and learning objectives to describe how we as teachers can develop students' competencies from a beginner to an advanced level. This led to the construction of the curriculum compass (Figure 1) as an overarching model for how teachers can plan, carry out and evaluate teaching and learning for values in design. In parallel, several rounds of so-called pattern mining workshops were conducted on the desk research reports and amongst the project participants to capture existing knowledge and practice. Through this process, a large catalogue of potential teaching activities was generated, and from this catalogue, a selection of potential activities (pedagogical patterns) was selected and developed resulting in the design of 28 concrete 'meso level' teaching activities cutting across disciplines and spanning the three pillars and different SOLO levels. Each teaching activity can be selected and used as a standalone activity or in combination with other activities. Furthermore, 12 assessment activities were developed using the same method, aimed at supporting teachers in evaluating whether the intended learning outcomes were achieved by the students.

PHASE 3) EVALUATION AND REFLECTION

Alongside the design of the 28 teaching activities and the 12 assessment activities, iterative peer-review of all activities were carried out. For this, a pedagogical pattern evaluation method called shepherding (a method very similar to peer-review processes within research publications, see Harrison, 1999) was used. This method ensured multiple cycles of evaluation, reflection, and revision of the activities throughout the project. Parallel to this, the teaching activities were put into practice and evaluated through 38 pilots involving around 50 teachers and 1,563 students coming from

various disciplines, programmes, institutions, and countries. The VASE project's development process concluded with the publication of all teaching and assessment activities, the curriculum compass, cases, reports, and research publications on the VASE OER online platform (VASE, 2021), which combined offers an expansive pedagogical framework for teachers teaching design and technology subjects in higher education.

As described above, the main outcome of the project – the collection of teaching and assessment activities – was developed using a modification of the pedagogical design pattern method (Goodyear, 2005; Nørgård et al., 2019, 2022; Köppe et al., 2018; Laurillard, 2012). The method is aimed at capturing 'best practice' from research and practice, which are then developed into concrete 'meso level' activities for teaching and learning within a specific domain; here teaching for values in design. The pedagogical pattern method has been modified in that we have iteratively developed our own pattern template (Table 3). Some of the key differences include: explication of students' learning objectives based on the SOLO taxonomy to enable teachers to target different learning levels when teaching for values in design; development of both teaching activities and assessment activities for teachers to provide them with methods for assessing learning in relation to values in design; a strong focus on describing the concrete steps teachers and students take during the activities to support experienced as well as less experienced teachers within the practice of teaching for values in design.

As teachers ourselves, on the one hand, we find that teaching activities need to be sufficiently elaborated so that we know what to do, how to do it, and why we should do it. On the other hand, the activities must not be seen as 'micromanaging' but instead be open enough to adapt to the way we teach for values in design within our own specific disciplines, programmes, or modules. This is important to ensure the adaptability and reusability of the offered teaching activities across different contexts and disciplines while preserving the best practice of the activity. Here, pedagogical design patterns offer a systematic way for developing new teaching and learning activities through creating couplings between educational theories, methods, and practice (Goodyear, 2005). The core premises of developing a substantial and sound pedagogical pattern collection (here: teaching and assessment activities) are 'systematisation', 'sharing' and 'adaptability' (Goodyear, 2005; Laurillard, 2012; Pedagogical Patterns Project, 2012; EuroPLoP, 2021). Systematisation of educational development and practice involves reflective and iterative development processes where all activities are designed using concerted methods, identical templates, and joint review procedures. Sharing of the systematically developed collection happens through creating an openly published activity repository or teaching resource (here: the VASE OER platform published under Creative Commons) to be shared with all teachers and educational developers within that domain. Adaptability is achieved through ensuring that the descriptions and instructions of each activities targets the 'meso-level', i.e., the activity contains enough information for non-experts to be able to carry out the activ-

ity but without the activity taking over or 'micromanaging' the teaching situation (here: the VASE activities can be taught across a range different disciplines and educational contexts and based on different pedagogical purposes and approaches).

3. RESULTS: THE VASE FRAMEWORK

The visualisation model of the VASE framework (Figure 1) maps the teachers' movement between the different dimensions of the framework when they are planning and carrying out teaching (moving from the centre of the model outwards) or are checking for students' learning (moving from the edge of the model inwards). The hope is that the VASE framework, on the one hand, can support teachers to systematically plan and carry out teaching, and, on the other hand, can scaffold robust learning by giving teachers ways to assess and check learning outcomes (these step-by-

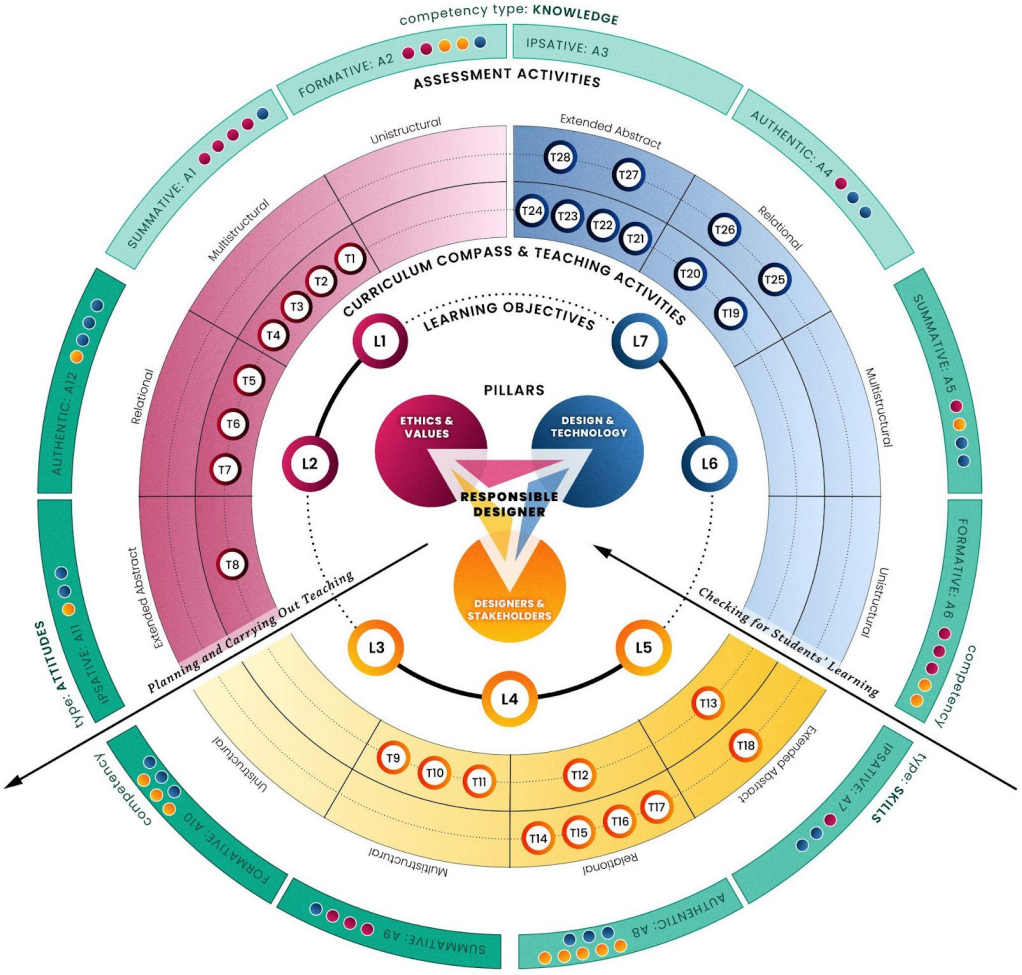

Figure 1. The visualised VASE pedagogical framework for planning and carrying out teaching (moving from the centre of the model and outwards) or checking for students' learning (moving from the edge of the model and inwards).

step processes are put into more detail below). Furthermore, the framework aims at advancing such processes through a multiuse approach to ensure both pedagogical flexibility and contextual adaptability. For teachers, the VASE framework can be used to select relevant stand-alone activities targeting specific values in design dimensions or learning objectives that are the most relevant for teachers within a particular discipline, curriculum, module or teaching session. But it can also be used to create longer in-depth learning pathways for students through combining several teaching activities within a specific domain, that develop students' understanding from simple (unistructural) to complex (extended abstract). Furthermore, teachers can also combine activities across different design dimensions and learning objectives to provide students with a broad foundation to values in design within an appropriate level of competence.

The VASE framework is constructed from and organised around different elements that, when taken together, constitute the main results of the VASE project (VASE, 2021a). The elements will be presented and described in more detail in the following sections:

- The three pillars cover the competency domains that have been identified through desk research reports on values in design and were found to be central when educating responsible designers
- The seven learning objectives guide teachers when teaching for values in design
- The curriculum compass contains 20 specific learning outcomes spanning the three pillars and the SOLO taxonomy and help facilitate students' progression from simple to more complex understandings. The 20 learning outcomes are linked directly to the 28 concrete teaching activities developed throughout the project
- The 28 teaching activities materialise, concretise, and integrate the contents of the pillars, overarching learning objectives and specific learning outcomes into step-by-step activities for teaching values in design
- The 12 assessment activities link back to specific teaching activities to support teachers in checking whether the teaching activities' learning outcomes were achieved by the students

In planning and carrying out teaching for values in design teachers can take the following steps using the VASE framework:

1. Teachers decide on the core area(s) that will be the focus of their teaching for values in design (the pillars) and the main outcome(s) that students should obtain (learning objectives) (Table 1).
2. Teachers then navigate the curriculum compass matrix (Figure 3) and decide on the level of knowledge (SOLO taxonomy) and specific learning outcomes

3. Teachers explore and choose between the possible concrete teaching activities that are connected to the selected learning outcomes in the curriculum compass matrix

4. Teachers prepare their teaching session and decide how they would like to assess whether the learning outcomes are obtained. For this, they can choose to use one of the proposed assessment activities that are connected to each of the individual teaching activities

5. Finally, teachers carry out their teaching for values in design in the classroom

In assessing and checking for students' knowledge, skills, and attitudes in relation to values in design, teachers can take the following steps using the VASE framework:

1. After the teaching activity, teachers can ask students to perform one of the proposed assessment activities connected to the specific teaching activity

2. Students carry out the individual steps of the assessment activity while focusing on addressing the learning outcomes of the teaching activity

3. Teachers and/or students go through the students' products focusing on if, in what way and to what extent the learning outcomes of the teaching activity were obtained

4. Finally, teachers can then return to the curriculum compass and its more general learning outcomes, to assess whether students are in need of deeper or more expansive competencies within a particular area (keeping within the same or similar cells within the matrix), in need of more advanced and complex competencies within the area (moving up the SOLO taxonomy within a row or pillar), or are in need of a general and broader understanding of values in design (moving to different cells or other pillars)

Importantly, the above process of planning, carrying out, and checking for students' learning is often not a linear process. Mostly, teachers will go back and forth between

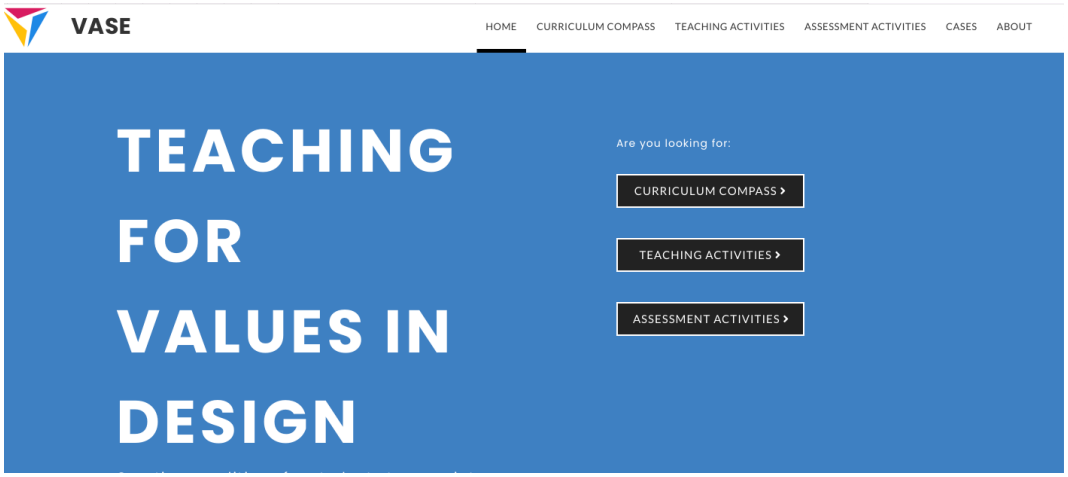

Figure 2. The VASE OER online platform aimed at supporting teachers in teaching for values in design (VASE, 2021).

PILLARS	LEARNING OBJECTIVES
ETHICS AND VALUES	L1. Recognize and describe different values L2. Critically reflect on how values are manifested in designs
DESIGNERS AND STAKEHOLDERS	L3. Identify and describe direct and indirect stakeholders of a design L4. Elicit stakeholder values L5. Identify possible tensions between different stakeholder values and imagine how to mediate these tensions in a design
TECHNOLOGY AND DESIGN	L6. Integrate values into the design process L7. Analyse and critically reflect on the impact of a design (brief) and its manifested values in context

Table 1. Seven key learning objectives of teaching for values in design in relation to the three core competency pillars.

the different steps to explore and reflect on the various opportunities and most relevant learning outcomes or activities to ensure coherence with their way of teaching and the specificities of their discipline, programme, and subject.

As mentioned in the beginning of this section, The VASE framework is comprised of different elements that, when taken together, constitute the main results of the VASE project (VASE, 2021a). These elements will now be presented and described in more detail in the following.

3.1. THE PILLARS

The VASE framework is built up around three core competency pillars:

I) The Ethics and Values pillar explains the underlying theoretical foundations of ethics and values that students need to consider, both in their methods and in their design process, as well as in taking responsibility for their product or service.

II) The Designers and Stakeholders pillar addresses methods and processes for students to ethically engage with different stakeholders and their values, acknowledging that they themselves are stakeholders too.

III) The Technology and Design pillar addresses methods and processes that allow students to practically design and evaluate products and services with values in mind.

The three pillars aim to cover what we consider the main knowledge and skills for becoming a responsible designer: the theoretical background, a focus on different stakeholder needs, as well as the skills to actively engage with technology and values in the design process. Furthermore, the three pillars also cover various parts of the

design process. The Ethics and Values pillar addresses foundational knowledge on different approaches for how to address values in the design process. The Designers and Stakeholders pillar addresses the design phases of research and synthesis. Finally, the Technology and Design pillar covers the knowledge and methods needed for the ideation and evaluation phases.

3.2. THE LEARNING OBJECTIVES

The overarching learning objective guiding the VASE framework is:

to develop the knowledge, skills, and attitudes students need in order to consider the broader context and implications of design and design processes, and through this the possibility for them to become more responsible designers.

This overarching learning objective is broken down into more specific learning objectives. A major challenge was to transform ambiguous terms such as 'become responsible designers' to more specific, observable learning outcomes. The aim was to articulate a set of key learning objectives that promote important cognitive, psycho-motor, and attitudinal attributes, and at the same time provide some useful methods of measuring their achievement (Davies, 2000). To achieve this, we applied the Structure of the Observed Learning Outcome (SOLO) taxonomy (Biggs, 1982).

As a result, we have formulated seven key learning objectives (L1–7), each related to one of the three core competency pillars (Table 1). These learning objectives feature a mixture of low-level, mid-level, and high-level outcomes. We believe that students who have achieved all these learning objectives and consciously apply their abilities in both the design process and deliverables are (on their way to becoming) responsible designers.

3.3. THE CURRICULUM COMPASS

The curriculum compass (Figure 3) provides an overview of the theory, structure, and resources that are the backbone of the VASE framework. It describes general learning outcomes for teaching values in design. These learning outcomes are distributed across the three core competency pillars, design phases, and the SOLO taxonomy levels of competency (Biggs, 1982). Progression in students' learning can be defined as moving up in SOLO levels, from unistructural, to multi-structural, relational, and up to extended abstract level as the highest level. Using the SOLO taxonomy visualises how students' competencies in relation to values in design can develop gradually in multiple directions. By combining the learning outcomes listed in the different cells of the curriculum compass, teachers may support students in becoming

Pillars	Design Phase	SOLO Taxonomy Level			
		Unistructural ●	Multistructural ●●	Relational ●●●	Extended Abstract ●●●●
Ethics & Values	Values Theory	Identify values and name approaches to ethics (e.g., consequentialism) and values in design (e.g., Value-Sensitive Design).	List, describe, and combine different approaches to ethics and values in design.	Analyze, compare, and argue for how values are manifested in design.	Interpret, evaluate, and critically reflect on values and their manifestations in design.
Designers & Stakeholders	Research	Recognize and define the notions around researching designers' and stakeholders' roles and values (e.g., indirect & direct stakeholders).	List, characterize, and report on designers' and stakeholders' roles and values.	Elicit, interpret and contrast designers' and stakeholders' roles and values.	Judge, reason about, and critically reflect on designers' and stakeholders' roles and values.
	Synthesis	Recognize and define the notions around interpreting and combining different designer and stakeholder values into a design direction (e.g., value manifesto).	List, characterize, and report on notions around interpreting and combining different designer and stakeholder values into a design direction.	Interpret, adapt, and plan one's design direction based on the identified designer and stakeholder values.	Reason about, reflect on, and criticize the newly developed design direction based on the identified designer and stakeholder values.
Technology & Design	Ideation	Identify methods for ideating with values (e.g., envisioning).	List and describe methods for ideating with values.	Adapt and apply methods for ideating with values.	Critically reflect on the results of the ideation with values.
	Evaluation	Identify methods for evaluating designs in terms of values (e.g., public evaluation).	List and describe methods for evaluating designs in terms of values.	Adapt and apply methods for evaluating designs in terms of values.	Critically reflect on the evaluation of the designs in terms of values.

Figure 3. The curriculum compass. Source: https://teachingforvaluesindesign.eu/curriculum_compass.html
Continues in the next page.

more responsible designers by developing knowledge, skills, and attitudes that can be deep and specialised (moving students' competencies from unistructural to extended abstract) or wide-ranging and generalist (cutting across all three pillars). Or both. The teacher can choose the direction that fits their purpose for teaching values in design as well as on the aims and objectives of the discipline, programme, module, or teaching session in question.

The 20 learning outcomes described in the curriculum compass are connected to a number of practical teaching activities. The teaching activities are, in turn, connected to suggested assessment activities that support teachers in judging whether the learning outcomes were achieved.

3.4. THE TEACHING ACTIVITIES

The 28 teaching activities included in the VASE framework (Table 2) are connected to specific learning outcomes in the curriculum compass (Figure 3) aimed at creating conditions for students to achieve those learning outcomes. For instance, if a teacher is teaching a course that focuses on concept generation and prototyping (the pillar Technology and Design) and wants their students to be able to 'critically reflect on the results of the ideation with values' (Ideation phase, Extended Abstract level) as a learning outcome, they are offered four different teaching activities: T21. Identifying and Resolving Value Tensions, T22. Exploring Values through Extreme Worlds, T23. Re-designing for Different Cultures, or T24. Envisioning Future Scenarios.

PILLAR	TEACHING ACTIVITIES
I) Ethics and Values	T1. Introduction to values in design T2. Introduction to ethics in design T3. Introduction to cultures and values in design T4. Design with and for certain philosophies T5. Manifestos on values and ethics T6. Values manifested in products, system, and services T7. Values clustering for developing students' value vocabularies T8. Understanding values changing over time
II) Designers and Stakeholders	T9. Individual designer's values identification and hierarchy T10. Design team's values identification and hierarchy T11. Design team's value statement manifesto T12. Listing stakeholders and their values T13. Stakeholder values elicitation T14. Mapping stakeholder value landscapes T15. Project values identification T16. Value-based reformulation of the design draft T18. Constructing value-based design requirements T17. The game changer
III) Technology and Design	T19. Visualising values in design with mood boards T20. Understanding value tensions T21. Identifying and resolving value tensions T22. Exploring values through extreme worlds T23. Re-designing for different cultures T24. Envisioning future scenarios T25. Contextualising values through reflection in action T26. Evaluating values in design with stakeholders T27. Public examination of values in design T28. Design after evaluation of prototype

Table 2. 28 teaching activities distributed across the three core competency pillars.

Each teaching activity contains step-by-step instructions and ready-to-use tools (e.g., lecture slides, worksheets, prompts, readings) so that teachers can easily use it without much preparation. The teaching activities come in various forms including lectures, hands-on design studios, and fieldwork, and covers a wide range of ethical topics including value tensions, value dynamics, non-Western cultures, and extreme worldviews. To ensure consistency across the teaching activities, a pedagogical pattern template was used (Table 3). The activities were quality-assured through multiple rounds

PATTERN TEMPLATE	EXAMPLE OF A TEACHING ACTIVITY
TITLE The title of the specific activity	T24. Envisioning future scenarios
SUMMARY A short summary of the activity focusing on how the activity develops values in design and which competencies the activity is developing	In this teaching activity, students will generate future scenarios to imagine and analyse potential widespread consequences, long-term effects, and societal impacts of their own or others' designs. The activity will lead students to envision at least one use or user scenario that goes beyond what they would normally describe as the intended use of their design. By applying their understanding of potential consequences and effects, they may rethink their designs and design decisions.
BACKGROUND A description of why the values in design competencies are important and what problematic situations during or after their education that students might find themselves in if they do not obtain these competencies	When focusing on users and user experiences, students may approach their own or others' designs from a single, narrow perspective without realising its potential impact on a broader society. Evidently, designs can have widespread consequences and long-term effects on various stakeholders beyond the stakeholders initially imagined, both in positive and negative ways […] (see full text on the VASE OER online platform)
LEARNING OUTCOMES The results and benefits of the activity in the form of specific learning outcomes and results of the activity are described and listed	After the teaching activity students will be able to: ● generate future scenarios to imagine and analyse potential widespread consequences, long-term effects, and societal impacts of their own or others' designs ● apply their understanding of potential widespread consequences and long-term effects to potentially rethink their design and design decisions
PREPARATION Description of how the teacher prepares for the activity and provides the teacher with the materials needed for carrying out the activity	● Prepare a handout of the provided envisioning prompts ● Prepare a short introduction lecture on the importance of being conscious of the broad impact and long-term effects of a design (see e.g., the teaching activity Introduction to Values in design) […] (see full text on the VASE OER online platform)
CONTENT AND STEP-BY-STEP INSTRUCTIONS The activity is described in step-by-step instructions for the teacher to support the teacher in carrying out the activity and facilitate students' learning so they might achieve the activity's learning outcomes	1. Give the lecture that you have prepared. Ask the students to select a project that they are developing as a group or that they have developed on their own or present an example design case that they can develop a scenario for 2. Walk through the process of the activity, instructions, time plan, and envisioning prompts. Describe the expected outcome, which is at least one future scenario for the design, using one or more of the envisioning criteria, and a reflection on possible consequences for the design […] (see full text on the VASE OER platform)
SUGGESTED ASSESSMENT ACTIVITIES AND CRITERIA Two suggested assessment activities are described and a link to the assessment activities are given to support the teacher in choosing relevant assessment activities when checking whether the intended learning outcomes are achieved by the students Also, bullet points describing what students might focus on when performing the assessment activity are given to support both teachers and students in obtaining the learning outcomes of both teaching activity and curriculum compass	To assess whether the intended learning outcomes were attained by the teaching activity the following assessment activities can be carried out (in class or after class). Suggested assessment activities: Assessing students' learning by asking them to apply ***their learning about future scenarios on a case study*** (summative assessment) by imagining and analysing potential consequences, long-term effects, or societal impacts of a design through a value scenario using relevant envisioning criteria (including values) and prompts. […] (see full text on the VASE OER platform) Suggested assessment criteria: In the assessment activity ask students to focus on ● describing what envisioning criteria and prompts are relevant to apply for a specific case ● imagining potential consequences, long-term effects, and societal impacts of a design through a value scenario that goes beyond what would normally be described as intended use, using relevant envisioning criteria (including values) and prompts ● analysing the potential consequences of a design using relevant envisioning criteria (including values) through a value scenario and providing suggestions for how to mitigate negative consequences (e.g., in regard to re-design, further stakeholder dialogue, possible tensions) through rethinking the design.

Table 3. The pattern template, here filled out with parts of the teaching activity T24. Envisioning future scenarios.

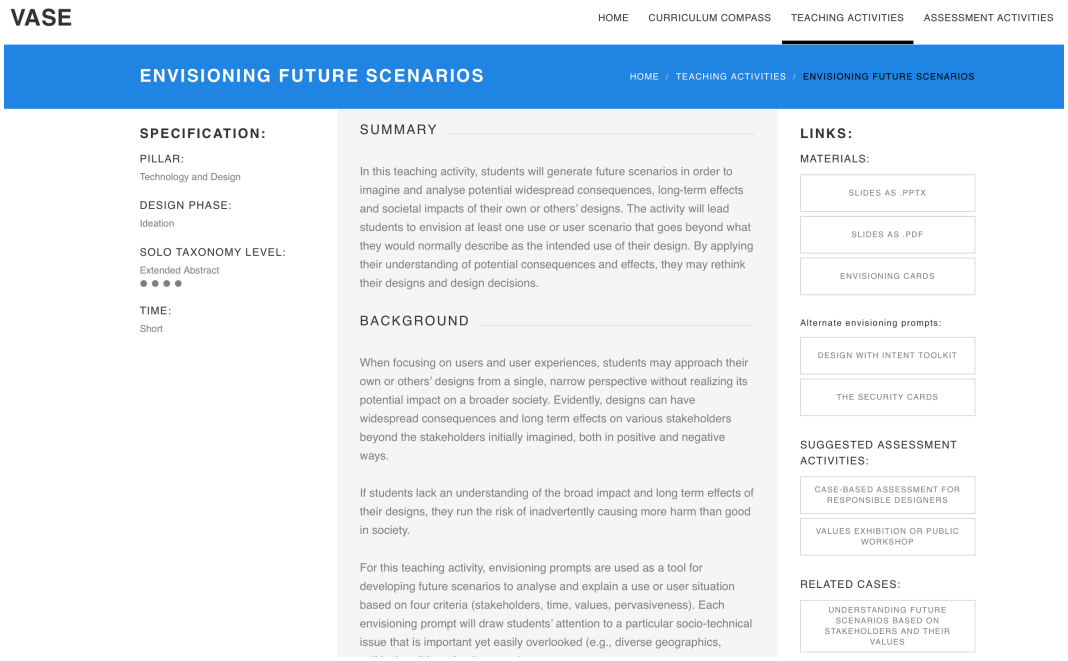

Figure 4. Screenshot from the VASE OER online platform presenting the teaching activity T24. Envisioning future scenarios (VASE, 2021). Source: https://teachingforvaluesindesign.eu/24_envisioningfuturescenarios.html

of peer-review using the pedagogical pattern method of shepherding (Harrison, 1999).

To help teachers to navigate the full collection of teaching activities published on the VASE OER online platform (VASE, 2021), the activities can be filtered based on their core competency pillar, design phase, time needed to perform the activity and SOLO level (Figure 4).

3.5. THE ASSESSMENT ACTIVITIES

In educating responsible designers, we do not find it sufficient to consider only the final material result of learning (e.g., the design artefact). Rather, the learning process needs to be considered in assessment. This is especially important for teaching values in design, where the final deliverables (e.g., the way a prototype looks and functions) are arguably less important than the process used to arrive at this material result (e.g., properly considering stakeholders and their values in the design process). The teaching activities included in the VASE framework are therefore accompanied by assessment activities with a focus on learning processes. The framework includes 12 assessment activities (Table 4), which are structured around the three main competence types related to learning, namely: knowledge, skills, and attitudes (Baartman & Bruin, 2011). Additionally, the assessment activities are structured in four assessment forms: summative, formative, authentic, and ipsative.

In summative assessment, the focus is on measuring the level of learning, typically against standardised criteria, by collecting, interpreting, and reporting evidence

of learning (Dolin, 2017). In formative assessment, the goal is to provide feedback that moves students forward (Hughes, 2014). Theoretically, any learning outcome can be assessed summatively (typically by giving a grade) or formatively (typically by providing feedback). This includes traditional assessment activities such as examinations or (prototype) design deliverables.

Authentic assessment (or performance assessment), is an assessment form which focuses on the value of students' learning in the 'real world' (situated assessment in context), translating school-based ideas to authentic situations and tasks (Ashford-Rowe et al., 2014). Ipsative assessment activities aim to activate students as owners of learning (Hughes, 2014). Ipsative assessment compares a learners' current performances with their previous performances, making it a highly personalised form of assessment. Throughout this process, ipsative assessments provide valuable feedback for students about their strengths and weaknesses.

Each of the 28 teaching activities included in the VASE framework are linked to two assessment activities. For example, the teaching activity T24. Envisioning future scenarios is linked to the two assessment activities A9. Case-based assessment for responsible designers and A12. Value-based public exhibition or public workshop (Figure 5).

The assessment activities were developed using the same iterative method, peer-review process, and similar pattern structure as for the teaching activities. The more

COMPETENCY TYPE	ASSESSMENT FORM	ASSESSMENT ACTIVITIES
Knowledge	Summative	A1. Mind mapping for responsible design
	Formative	A2. Reflective values report
	Ipsative	A3. Personal video
	Authentic	A4. Applying knowledge to real-world examples
Skills	Summative	A5. Video pitching for responsible designers
	Formative	A6. Round Robin values Brainwriting
	Ipsative	A7. Historical value timeline
	Authentic	A8. Peer feedback for responsible designers
Attitude	Summative	A9. Case-based assessment for responsible designers
	Formative	A10. Self-assessment for responsible designers
	Ipsative	A11. Blogging for responsible designers
	Authentic	A12. Values exhibition or public workshop

Table 4. 12 assessment activities spanning over competency types and assessment forms.

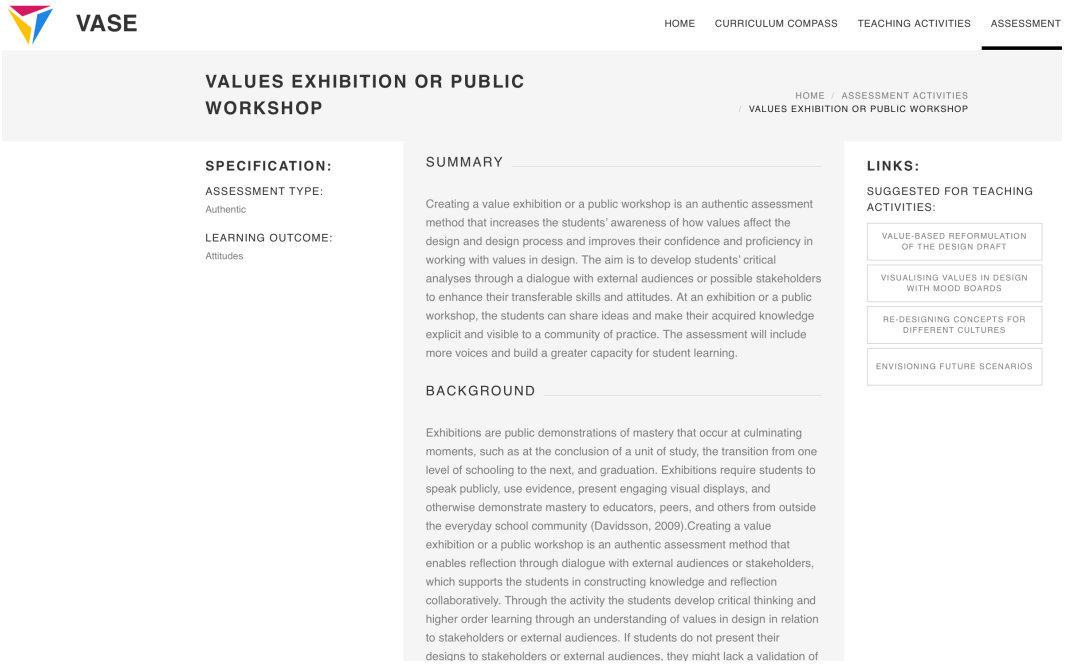

Figure 5. Screenshot from the VASE OER online platform presenting the assessment activity A12. Values exhibition or public workshop (VASE, 2021).

general description of the assessment activity was then developed into more specific assessment criteria formulated in each teaching activity (see the last row in Table 3 for examples on 'Suggested assessment criteria').

3.6. USING THE VASE PEDAGOGICAL FRAMEWORK

The VASE framework can be used both as a reflective planning tool for targeting specific value-sensitive competencies or learning outcomes, as well as an inspirational resource for insight into how one can teach for values in design that can be adopted across different educational contexts. In this way, the VASE framework can, on the one hand, support teachers in systematically planning and carrying out teaching, and, on the other hand, help facilitate robust learning by giving teachers ways to assess and check for learning.

The VASE framework can be used to:

- Select specific stand-alone activities

Teachers can explore the overarching learning objectives and select those that are most relevant to their discipline, curriculum, or course. The learning objectives are described in broad terms while the teaching activities connected to each of the learning objectives execute them in concrete ways

- Create in-depth learning pathways

Teachers can combine concrete teaching activities that move students from a

simple (unistructural) to a complex (extended abstract) level of understanding of values in design within a specific pillar. Each of the three pillars represent core areas of teaching values in design. Integrating learning pathways in teaching allows students to build deeper knowledge, skills, and attitudes progressively to acquire a desired set of competencies within a specific pillar

- Give students a broad foundation

Teachers can combine concrete activities across all three pillars that create a broad foundation for students to become more responsible designers. Creating a broad foundation within a certain level of understanding allows students to develop a more holistic approach to values in design in relation to a select level of competence

4. CONCLUDING WORDS

This chapter puts forward a proposal for a pedagogical framework, namely the VASE framework (Figure 1), for educating responsible designers by teaching values in design. The VASE framework is unique in a European higher education context, both in its systematic use of the adapted pedagogical pattern method and double-pedagogical framework to create research-based, practice-informed, and peer-reviewed teaching activities, as well as its open educational platform for teaching and assessment activities. We will end this chapter by reflecting upon gaps and opportunities, which open up for further explorations and development of educational resources creating conditions for students to grow into responsible designers.

4.1. THE DEVELOPMENT OF THE VASE FRAMEWORK

In the iterative development of the VASE framework, we have strived to include and cover as many pedagogical aspects as possible. However, as made visible in the model of the VASE framework (Figure 1), there are some gaps. For instance, there are no teaching or assessment activities connected to the lowest unistructural level of the learning outcomes in the curriculum compass. This is quite deliberate, as it has never been a goal of this work to support the lowest levels of the SOLO taxonomy. The approach has been to activate the students' learning in practice, meaning that the students should be able to not only identify various relevant aspects, but also be able to describe why they are relevant. A further gap in the framework is in the third pillar (Technology and Design), where there are no activities in either the unistructural or the multi-structural level. The reason for this is that in these later phases of the design process, the learning progression should have moved up to relational and extended

levels, where the student is able to adapt, apply, and reflect on various aspects for values in design. In line with this, it is also evident that in the first pillar (Ethics and Values) there is only one single teaching activity in the extended abstract level, namely T8. Understanding values changing over time. As this is in the first pillar, covering the underlying knowledge in the beginning of the design process, this is only expected that most activities are in the multi-structural and relational levels.

The SOLO taxonomy implies that learning can be divided into four categories, which arguably is a reductionist view on learning (Wong, 2007; Khan, 2015). We witnessed this in the development process, where it was sometimes difficult to fit multi-layered learning outcomes into a single SOLO category. There are, however, many good arguments for using the SOLO taxonomy; it is already widely used in education and is a familiar tool for teachers (Wong, 2007). SOLO provides an established and a common language for articulating and discussing learning outcomes (Hook, 2016), and that has been applied to many different subjects, from poetry and history (Biggs & Collis, 1982) to mathematics (Hattie & Brown, 2004). Further, its simplicity allows learning outcomes to be formulated precisely and in ways that make them comparable between educational contexts.

Taken together, the strong research foundation in the form of the desk research reports, the international co-development of activities, as well as the rigorous, consistent, and shared method and practises enabled the VASE project to achieve its ambition to deliver a high-quality open educational resource for the development of student' competencies for values in design and for promoting the role of teaching values in design. However, as it is recently launched and, so far, only partly tested in four countries, further investigation and more large-scale piloting are needed to assess whether the VASE framework is applicable across broader educational and cultural contexts.

4.2. APPLYING THE VASE FRAMEWORK: HOW DOES IT WORK IN PRACTICE?

In designing open educational resources, a high level of generalisation is often necessary to accommodate a wide range of learning contexts, as well as to support a high degree of appropriation. Due to the situated nature of learning and teaching processes, teaching activities might not be used in the exact same way that the educational designers had originally envisioned. This appropriation is not a sign of failure, but rather shows that the users (that is, teachers) understand and are comfortable enough with the design to try using it in their own ways (Dix, 2007).

We have conducted a comparative study, involving two teachers in two different countries and educational settings, where they piloted the teaching activity T7. Values clustering for developing students' value vocabularies (Nilsson et al., 2020).

Here, we have gained an understanding of the importance of including several inspirational examples for the teachers to see how one can perform a teaching activity in a flexible manner, instead of prescribing a strict guideline for implementing the activity. What became evident in our study is how teachers can take the same teaching activity description and then be creative to modify it to meet their own needs. That is why a design for use must be about a design for change (Dix, 2007), and why we have applied an adaptability approach when developing the activities. Adaptability here refers to describing the activities so that they contain enough information and instruction for non-experts to carry them out but are open and flexible enough to be adapted across different disciplines or contexts and for different pedagogical purposes or approaches. The possibility of appropriation can further create a feeling of ownership since the users will feel that they are in control and can experiment to find new ways to achieve their goals. However, since the VASE framework and OER have been launched only recently, studying the long-term appropriation would be an interesting topic for future studies, tracing the iterative modification of a design activity initiated by the same teacher over time.

4.3. EDUCATING THE RESPONSIBLE DESIGNER

As part of the iterative development of the teaching materials, we have involved teachers and students in piloting the material. The teachers reported that they experience professional development through a qualitative and needed update of the design curriculum, and increased capacity to teach for values in design in relevant and innovative ways. The participating students have reported that they experience achieving relevant labour market skills, future-ready education, and updated knowledge about how to understand and act ethically on trade-offs between values, design, and social forces that emerge through human use of that design. So, in that sense, early results indicate that we have achieved what we set out to do: educate responsible designers.

In a recent study we performed an adapted version of the teaching activity T24. Envisioning future scenarios, to identify the large-scale effects of teaching values in design (Kok et al., 2021). We first developed a traditional scenario-based design (SBD) to assess the implications of teaching values in design (Rosson & Carroll, 2002). This is not typically part of the envisioning teaching activity but allowed us to make a comparison between the SBD approach and the value scenario approach. We then developed two value scenarios, as described by Nathan et al. (2008), using prompts divided into the four envisioning topics to guide us (Friedman & Hendry, 2012). While the traditional scenario considers mostly the immediately obvious and desirable consequences of teaching values in design for direct stakeholders, the value scenarios – by incorporating direct and indirect stakeholders, time, values, and pervasiveness – open our eyes to

less obvious, unintended, concrete, long-term, and large-scale effects, both good and bad. It demonstrates that individual classroom outcomes are not the only important consequences one's teaching may have. Rather, the way education shapes students continues to play out beyond the classroom and throughout their professional lives. Envisioning has helped clarify in what ways students as well as indirect stakeholders (such as the people for whom they create designs) could be affected by teaching. At the same time, as designers of educational resources, we are aware of the fact that over time the political significance of education will change, and that we can never envision and imagine the full implications of our project (Tromp et al., 2011; Winner, 1980; Kok et al., 2021). While we see the VASE framework as a first but important step in offering a reflective pedagogical framework on teaching values in design, there is still much work ahead. This includes trying out the teaching material in other cultural and educational contexts, by other disciplines, and even more importantly, to try it out in contexts with other value systems, beyond the European and Western world. Hopefully the VASE framework and the teaching resources can continue to grow and travel widely over time. At least we, as authors, do not see this work as completed, and we invite the community to contribute and to help us to keep it relevant.

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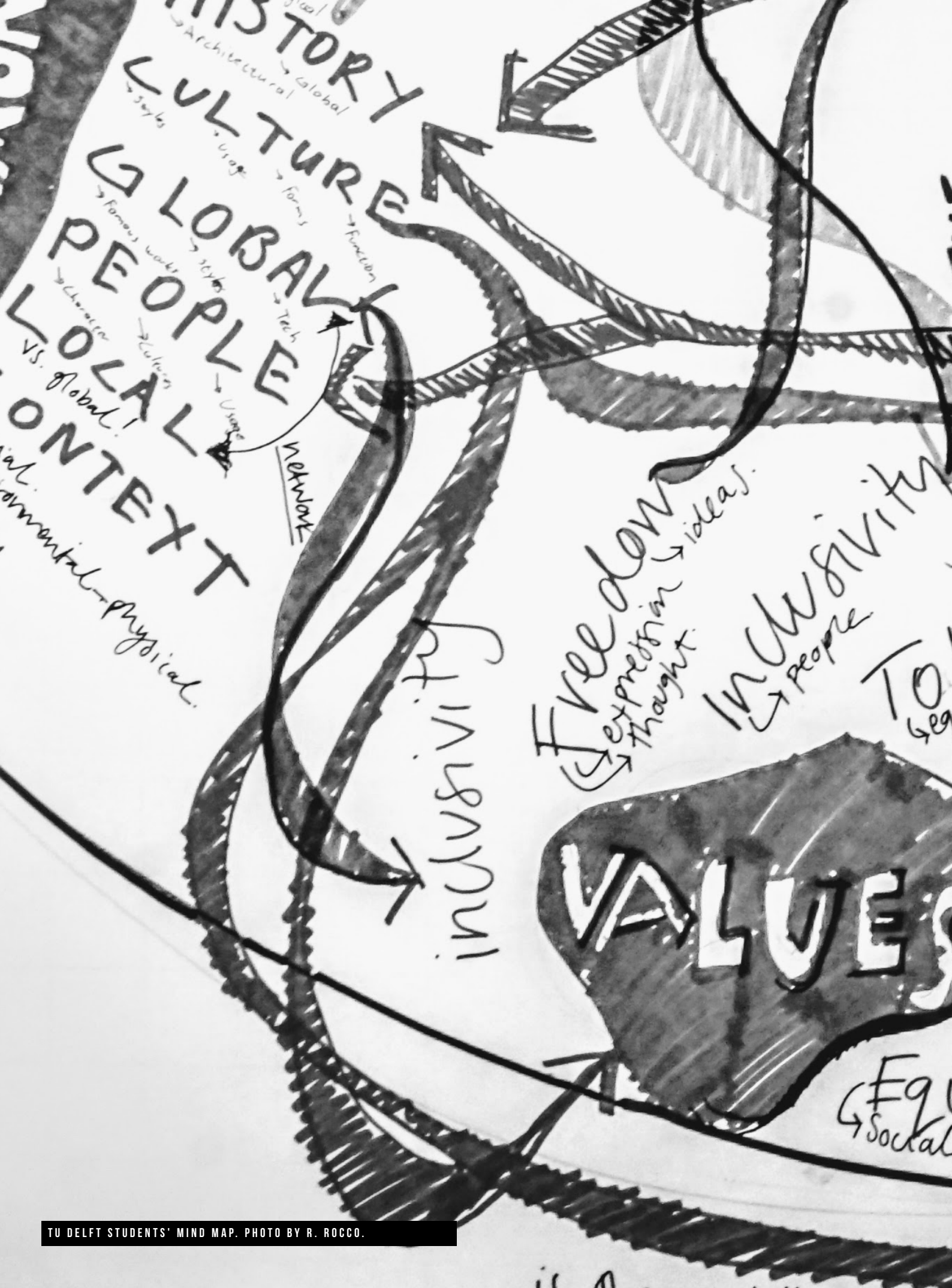

TU DELFT STUDENTS' MIND MAP. PHOTO BY R. ROCCO.


THE ARCHITECT
Problem solving
Community
QUESTIONING
CREATI
Consideration
thought-out solutions.
Humility
Empathy
others
Economic
enough?

VALUE-SENSITIVE DESIGN & MANAGEMENT OF BUILDINGS AND FACILITIES

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ABSTRACT

Architectural design may be defined as a synthesis of form, function, and technology, in a particular context, taking into account legal and financial preconditions. This book shows the need to also incorporate societal values. In the area of Corporate Real Estate Management (CREM) and Facilities Management (FM), a growing awareness comes to the fore, how buildings, facilities, and services can add value for clients, end-users, other stakeholders, and society as a whole. Adding value through well-thought design and management choices in the development of new buildings or interventions in buildings-in-use regards its contribution to the fulfilment of organisational objectives, end-user needs, interests of other stakeholders, and societal values. This chapter aims to connect both worlds by presenting findings from the CREM/FM field that may be incorporated in architectural design. It discusses twelve types of added value, possible conflicts and synergy between different values, and criteria for prioritisation. It also presents a step-by-step model to support value adding design and management processes. Incorporating societal values and values of clients and end-users is a prerequisite for socially responsible and user-centred design and management. Teaching students this way may help to provide a sustainable built environment that fits with people's needs and interests. The chapter ends with some suggestions on how to teach value-sensitive design and management of buildings and facilities.

CORPORATE REAL ESTATE, FACILITIES, USER-CENTRED, SOCIETAL VALUES, PRIORITIES

1. INTRODUCTION

In common language, the concept of 'value' is usually associated with major beliefs that steer our behaviour and drive our everyday actions. Value is often used as part of the twin 'norms and values', like freedom of speech, civil rights, and equal treatment of people regardless of gender, age, education, sexual orientation, religion, and ethnic origin. According to Hofstede et al. (2010), on a national level cultural differences come to the fore regarding five main value dimensions: small versus large power distance, collectivism versus individualism, femininity versus masculinity, weak versus strong uncertainty avoidance, and long-term versus short-term orientation. For instance, a feminine culture is associated with being more cooperative and caring for the quality of life, whereas a masculine culture is associated with being more competitive and striving for success. Similar differences come to the fore in organisational cultures (Cameron & Quinn, 2006). In workplace design, for instance a high-power distance may result in a higher level of privacy, territoriality, extra square meters and a luxurious interior design for top managers, as an expression of their status and position in the organisation (Plijter et al., 2014). Organisations who adopt the concept of Corporate Social Responsibility will likely pay more attention to societal values such as sustainability and incorporate the triple P of People, Planet, and Profit or Prosperity.

Another common meaning of value is what something is worth. In economics, *financial value* is one of the key values The economic theory of exchange value goes back to Rubin (1927), who attempted to explain the price of goods and services i.e., the amount of money that somebody is willing to pay for them. The market value of a building, for instance, depends on many tangible and intangible factors, such as its location, characteristics of the surroundings, the quality of the building (functional, architectural, technical), its uniqueness, government actions, the investment costs, and running costs to keep it up to date. However, a one-sided economic view may result in a cynical attitude as defined by the poet Oscar Wilde: someone who knows the price of everything but the value of nothing.

In the healthcare sector, value-based health care (VBHC) is defined as the ratio between the healing effects of medical processes on patients and the total costs to attain these health effects. As such, this concept links the aimed outcome to the required input. The VBH concept originates from the US and gets a growing interest, in particular since Michael Porter, a renowned professor at Harvard Business School, published the book Redefining Health Care: Creating Value-Based Competition on Results (Porter & Teisberg, 2006). VBHC connects human values to financial values, in order to keep health care affordable on a national and individual level and to provide health care that is both effective and efficient, and delivers value for money. Efficiency regards the relationship between the output from goods or services and the resources

to produce them – spending well. Effectiveness regards the relationship between the intended and actual results of public spending (outcomes) – spending wisely (National Audit Office, 2020).

1.1. FOCUS AND OUTLINE OF THIS CHAPTER

This chapter also explores both sides of value, i.e., output and outcome parameters and the costs and risks of the input i.e., design and management choices that aim to support distinct values. Whereas value-sensitive design focuses on societal values at large from a public perspective, the current chapter focuses on adding value from the perspective of clients, end-users, and other stakeholders. As such, this chapter invites the reader to consider value creation from a wider perspective. The next section briefly summarises the extension of architectural quality with value-sensitive design. The following sections present which lessons can be learned from the field of corporate real estate and facilities management. Based on an extensive review of the literature, input from experts, and interviews with practitioners, this part of the chapter sheds light on twelve value parameters. These values are interrelated and can be conflicting or support each other. Furthermore, a Value Adding Management process model is presented that follows the well-known four steps of Plan-Do-Check-Act. These steps are quite comparable to analysis-synthesis-simulation-evaluation and decision, which is more common in design processes. The chapter ends with some concluding remarks and suggestions how to teach value-sensitive design and management of buildings and facilities.

2. VALUE-SENSITIVE DESIGN

In his ten books *De Architectura*, Vitruvius, a Roman military architect and engineer who lived more than 2,000 years ago, describes three qualities of architecture: *firmitas*, *venustas*, and *utilitas*, i.e., solidity, beauty, and usefulness. Solidity refers to the construction and technical aspects. Beauty refers to aesthetic concerns and meaning. Usefulness regards whether a building is appropriate to its function and functional needs are met. Functional quality or *utility value* includes inter alia reachability, parking facilities, universal access, efficiency, adaptability, safety, support of spatial orientation, privacy, territoriality and social contact, health and well-being, and sustainability (van der Voordt, 2009). Nowadays, it is also emphasised that architecture is embedded in a social, cultural, economic, and political context, and subject to specified conditions such as time, money and regulations (van der Voordt & van Wegen, 2005).

Papers that discuss many other design quality indicators are, for instance, Markus (2003); Thomson et al. (2003); Prasad (2004); Adamson (2004); Eley (2004); Volker et al. (2008); Haron et al. (2013); Eilouti (2019), and Khajehpour and Rasooli (2020). Most of these publications also discuss tools to assess designs in the design phase and the quality of buildings-in-use. More recently, Khajehpour and Rasooli (2020) explored different theories of dimensions and components of quality in public open spaces. The data-collection included an extensive literature review, a Delphi approach in which 20 experts were interviewed in three rounds, and a survey among lay people that visited four courtyards, with a simple question: 'which courtyard do you prefer mostly, and why?' The paper classifies the main dimensions of design quality into functional, visual and morphological, experiential and perceptual, social, and ecological, each with a number of components.

Although quality and value are not the same, both concepts are closely related. Actually, quality is one of the shared values that most people strive for in their lives and represents the nominator in the ratio between outcome and input. The British English dictionary defines quality as 1) a distinguishing characteristic, property, or attribute, which can be described objectively, and 2) a degree of excellence, a more subjective judgement, like in the expression 'Beauty is in the eye of the beholder'. Although most publications on design quality don't mention the term value at all, the discussed qualities may also be perceived as values i.e., characteristics that are highly valued by designers and users.

Incorporation of societal values is explicitly mentioned in the literature on value-sensitive design. The main focus is on addressing *human values* throughout the design process (Friedman et al., 2002; 2017). Value is defined here as what is important to people in their lives, ethics, and morality. Value-sensitive design asks designers to be transparent about explicitly supported project values and their own individual values i.e., designer values (Friedman et al., 2017). Van de Poel and Royakkers (2011: 72) state that values should be distinguished from preferences or interests of people, and define values as 'lasting convictions or matters that people feel should be strived for, in general and not just for themselves, to be able to lead a good life or realize a good society.'

Van den Hoven et al. (2015) discuss how value-sensitive design is or could be applied in different domains, ranging from architecture to agricultural biotechnology, healthcare technology, economics, engineering, and more. In *The Politics of Things*, van den Hoven (2009) considers the use of technology to express moral values, for example, a car that will not start if the driver is drunk. Another example are mobile phones that turn out to affect traffic safety (van de Poel, 2021), which resulted in a feature to stop the mobile phone automatically when the owner starts driving. Here, safety and protecting people against unsafe and illegal behaviour are underlying values in technological design. A study by Burmeister et al. (2011) identified four key moral values: equality, freedom, respect, and trust. This study is based on a 30-month ethnographic

investigation of Australia's largest online community of seniors, 11 months of observing social interactions within this community, and in-depth, semi-structured interviews with 30 participants. The findings are in line with earlier studies that also identified equality and respect (as human dignity). In the *Handbook of Ethics, Values, and Technological Design* (van den Hoven et al., 2015), a vast number of value dimensions are discussed as well, including well-being, inclusiveness, presence, privacy, regulation, responsibility, safety, sustainability, trust, accountability and transparency, and democracy and justice. Most chapters in this book are strongly connected to these kinds of values.

3. VALUE-BASED MANAGEMENT OF BUILDINGS AND FACILITIES

In the late 1980s, the Dutch Minister of Education installed a so-called 'Verkenningscommissie' [scouting committee] to assess the programs of the Delft and Eindhoven Universities of Technology. One of its conclusions was the need for a broader study profile at the Faculty of Architecture. More attention should be paid to project and process management during the whole building cycle, from the first initiative till management of buildings-in-use. As a consequence, in Delft a new department was founded, initially called Real Estate and Project Management, currently called Department of Management in the Built Environment (MBE). MBE covers Real Estate Management (REM), Urban Development Management (UDM), Design and Construction Management (DCM), and Housing (H) (Prins & Hobma, 2016). One of its key values is that clients and end-users should be in the core of design and management of the built environment. For this reason, the REM section focuses on Corporate Real Estate Management (CREM) i.e., real estate for one's own use, in contrast to real estate that is being developed by developers and investors to get a return on investment in the real estate market. The concept of *added value* is included in the definition of CREM as 'the alignment of the real estate portfolio of a corporation or public authority to the needs of the core business, in order to obtain maximum added value for the business and to contribute optimally to the overall performance of the organisation' (Dewulf et al., 2000: 32). 'Added' refers to the difference between consolidation (no intervention at all), and alternative choices. Currently, in addition to business needs, other needs are incorporated as well. This clearly comes to the fore in the definition of added value as the trade-off between the benefits of a particular choice or intervention i.e., its contribution to the needs and objectives of clients, end-users and other stakeholders, and society as a whole, and the costs, risks and sacrifices to achieve these benefits (Jensen & van der Voordt, 2017).

A related discipline, Facilities Management (FM), originally focussed on management of facilities and services in the phase of buildings-in-use. According to the *Comité Européen de Normalisation* (CEN), FM may be defined as the integration of processes within an organisation to maintain and develop the agreed services, which support and improve the effectiveness of its primary activities (CEN, 2006). This definition emphasises the importance of supportive processes in order to facilitate the main activities of an organisation. In the new standard of the International Organization for Standardization (ISO), FM is also linked to the quality of life (ISO, 2017a). A key topic in FM is usability, which incorporates effectiveness (providing the right output), efficiency (using the right input), and satisfaction or experience of clients, customers, and end-users (Alexander, 2005; ISO, 2017b).

The developments in CREM and FM have in common that an optimal alignment with the values and needs of clients, end-users and other stakeholders, and society is key to

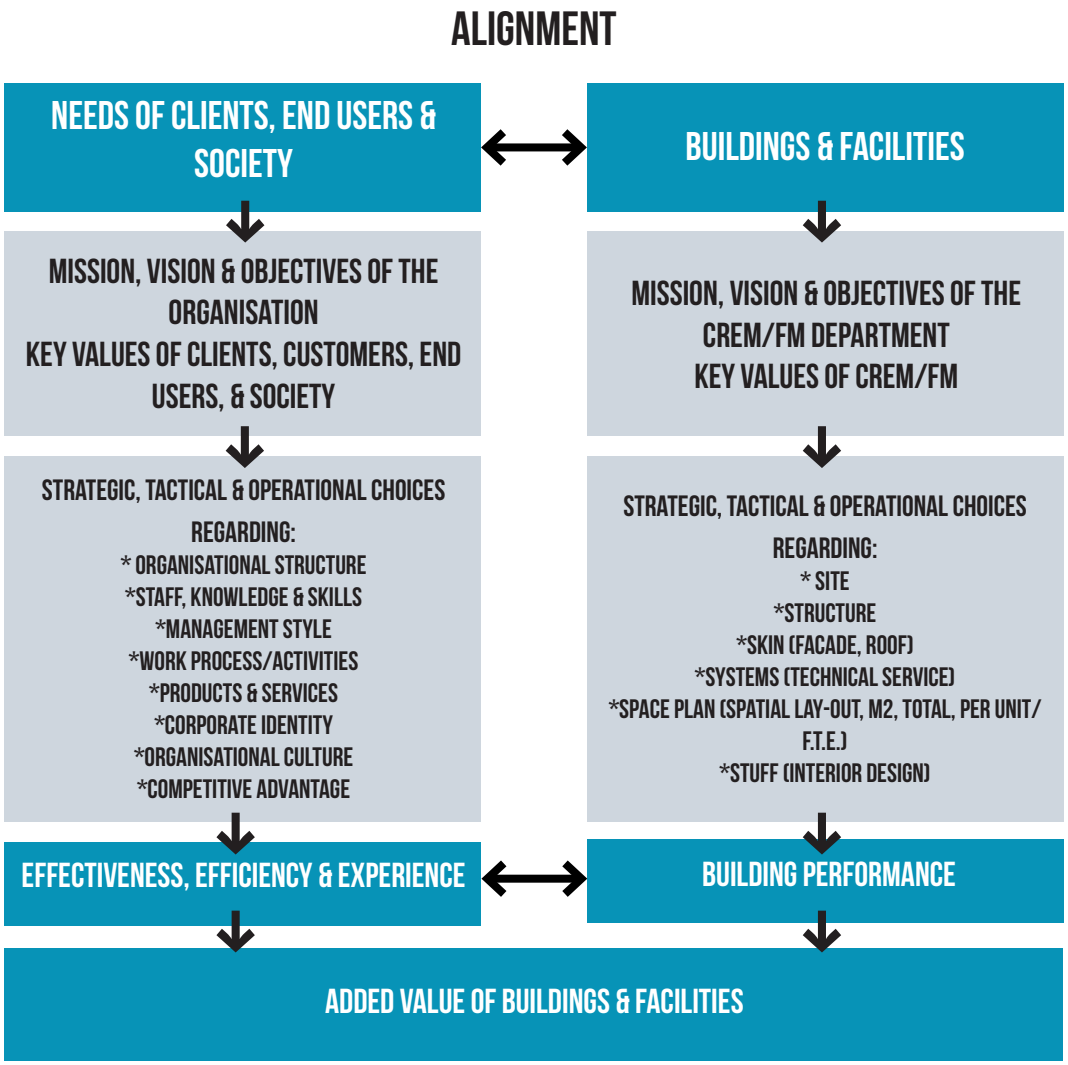

Figure 1: Alignment of buildings and facilities to the needs of clients, end-users, and society (adapted from Jensen and van der Voordt, 2017: 31).

be able to add value by appropriate management of buildings and facilities, see Figure 1.

The left side of Figure 1 regards the 'demand' side and shows a number of organisational choices that have to be made to realise the mission, vision, and objectives of the organisation, and to support the key values of clients, end-users, and society. The right side of Figure 1 regards the 'supply' side and shows a number of choices regarding the design and management of buildings and facilities, based on the taxonomy of Stewart Brand (1995). Building and facilities' characteristics that contribute to building performance and fit with key values of the demand side actually add value.

EXAMPLE: KEY VALUES OF A HOSPITAL AND ITS HOUSING AMBITIONS

The mission statement of a Dutch hospital includes ten leading topics:

1. Our hospital wants to be in the top ten of best European academic hospitals
2. Our patients are key. This requires excellent services, optimal care, and communication, and a professional treatment
3. All our scientific research should be at top level
4. We are leading in reginal education of doctors, nurses, and other care staff, and provide state-of-the-art education
5. We play an innovative role in our core activities
6. We work evidence-based
7. We are leading in identifying, stimulating, and guiding young talented people who want to work in the care sector or on medical research
8. As a leading institution we play a prominent role in the region of Amsterdam. Vice versa, our activities are influenced by the local context
9. We act both nationally and internationally
10. Our staff has the right knowledge, skills, and talents to conduct our core activities and supportive activities

HOUSING AMBITIONS

The accommodation policy of this hospital is derived from its organisational strategy and presents nine leading housing ambitions:

1. Optimal facilitating of our primary processes, and contributing to employee satisfaction and labour productivity
2. Healing environment. Patients should feel themselves comfortable in our building. This supports their well-being and healing process
3. Safety: Being accredited by the Joint Commission International (JCI)
4. Innovation power: The building should stimulate the creativity of our staff
5. Culture of collaboration
6. Flexibility and future value, by a high level of adaptability to new developments
7. Positive image, by attractive architecture and one-person bedrooms
8. Sustainability
9. Cost effectiveness: Cost reduction but not at the expense of our objectives

3.1. VALUE DIMENSIONS

An important distinction between values is the dichotomy of transaction value versus use value. The first one focuses on financial value and prices on the market, whereas the latter focuses on fit for purpose or fit-for-use. A more detailed distinction can be found in the book chapters by authors from different countries, disciplines, and sectors (offices, universities, health care, and industry) in Jensen et al. (2012), The editors detected fifty different descriptions of value parameters, which have been clustered in six types:

1. Use value: Quality in relation to the needs and preferences of the end-users
2. Customer value: Trade-off between benefits and costs for the customers or consumers
3. Economic, financial, or exchange value: The economic trade-off between costs and benefits
4. Social value: Connecting people by supporting social interaction, identity, and civic pride
5. Environmental value: Environmental impact of FM, Green FM
6. Relationship value: For example, getting high-quality services or experiencing a special treatment

The huge variety in value definitions and value parameters shows that this topic is still under development and needs more clarity and standardisation of its terminology. In a follow-up book on *Corporate Real Estate and Facilities Management as Value Drivers*, Jensen and van der Voordt (2017) compared many value parameters from different publications on corporate real estate and facilities management. Building on the work of, inter alia, Nourse and Roulac (1993), Lindholm and Nenonen (2006), and various PhD research projects at the department of MBE, a taxonomy of added value of corporate real estate (CRE) has been developed. Overall, 12 value parameters were seen to be leading: four people-related values (satisfaction, image, culture, health and safety), four process and product-related values (productivity, adaptability, innovation and creativity, risk), two economic values (cost, and value of assets), and two societal values (sustainability, and corporate social responsibility).

The next section briefly summarises which design and management choices may support these twelve value parameters, and how to measure them. The names of the authors of the related book chapters are included to do justice to their input.

4. A CLOSER LOOK AT TWELVE VALUE PARAMETERS

4.1.EMPLOYEE SATISFACTION (VAN DER VOORDT, DE BEEN, AND APPEL-MEULENBROEK)

Employee satisfaction can be an objective in itself, or a means to attain other goals, such as to attract and retain talented staff, or to stimulate engagement, motivation, and high work performance. Employee satisfaction can be supported by a functional spatial layout, spaces that support social interaction and privacy, ambiance, comfort, ergonomics, high quality IT equipment, and personal control of the indoor climate. Numerous satisfaction surveys among office workers show that accessibility of buildings and opportunities to communicate rank high in employee satisfaction. The architectural appearance, interior design, atmosphere, and available facilities are usually also highly appreciated in flexible offices with activity-based workplaces, more than in traditional cellular offices. However, indoor climate, privacy, opportunities to concentrate, storage facilities, and acoustics are much less appreciated (Brunia et al., 2016). Employee satisfaction with buildings, facilities, and services can be measured by asking the employees how satisfied they are with various topics, what they find most important, and which option they prefer out of various alternatives, and why.

4.2. IMAGE (VAN DER VOORDT)

The accommodation of an organisation can also be used as a means to support a particular image and to communicate brand values and corporate identity. The accommodation of a bank or law firm has a different look and feel than a building that accommodates a start-up or a high-tech firm. Transparency may be expressed by the use of glass, open voids or atriums, and open spaces. Caring for people may be expressed by user participation in the design and management process, and a user-friendly building. Hospitality might be translated into a nice and welcoming entrance area, a reception desk with friendly staff, easy wayfinding, and an attractive interior design. The Rotterdam Eye Hospital pays much attention to an attractive interior design to give patients a feeling of being welcome and comfortable and to reduce patients' stress. A company's commitment to sustainability can be expressed by proximity to public transport, a high score on BREEAM or LEED, and the choice of sustainable equipment. The contribution of architecture to a corporate identity can be measured by asking people: What image the building evokes? Which values do they associate with the accommodated organisation? And which characteristics of the building contribute most to particular brand values? Or to assess how the organisation and its building(s) appear in the media and on social media.

Figure 2: Eye Hospital, Rotterdam, the Netherlands. Photos by the author.
The spatial lay-out (above left), paintings (above right), and the patio (below left) show that this is not just a building, but an eye hospital. The waiting room (below right) shows two quotes by Antoine de Saint-Exupéry: 'one can only see with the heart', and 'what is essential is invisible for the eyes', in order to distract visitors from worrying about their eye problems. All these clues are meant to make patients feel comfortable and less stressed.

4.3. CULTURE (VAN DER VOORDT AND VAN MEEL)

Buildings act as cultural artefacts and symbols that reflect the culture of their inhabitants and express particular norms and values. Some companies put the CEO in an open plan work-area to demonstrate that the company wants to create a culture of openness and equality. Managers seated in spacious corner offices on the building's top floor express a hierarchical culture. In leading technology companies like Google and Facebook, the casual and informal culture is reflected in the interior design and facilities such as slides and game rooms. In individual cultures, kitchenettes and lounge rooms may be underused, whereas group cultures are more likely to make use of social places as gathering points to exchange knowledge, ideas, and ordinary gossip. Organisations that are open to change and experimentation may be

more successful in adopting innovative workplace concepts than organisations with a culture that is focused on stability and structure. So, it is important to understand if and how design decisions can support a current organisational culture or culture change. However, it should be noticed that a change in physical environment will never suffice to change a company's culture and may even be counterproductive if it is not part of a wider change process. When moving people from cellular offices into open plan offices, this intervention alone will not suddenly create a collaborative culture. Organisational culture can be measured by the Organisational Culture Assessment Instrument (Cameron & Quinn, 2006). Interviews with clients and a survey among end-users and visitors can shed light on how people rate an organisation on diverse cultural dimensions, and which design choices fit best with the current or desired culture.

4.4. HEALTH AND SAFETY (JENSEN AND VAN DER VOORDT)

The World Health Organization defines health as a state of complete physical, mental, and social well-being. This represents a wider scope than just the absence of disease. Design can contribute to health and well-being by creating a healthy environment, and to prevent or reduce work fatigue, occupational stress, headache, migraine, irritation of eyes, nose or throat, or worse diseases, such as a burnout. Important factors include a spatial layout that both supports social interaction and concentration, biophilic design (contact with nature, natural materials), appropriate lighting and acoustics, thermal comfort, ergonomic furniture, a healthy Indoor Air Quality (IAQ) without chemical and biological agents, and avoiding hazardous materials and radiation. 'Active design' may stimulate active behaviour, for instance by providing an inviting staircase to seduce people to take the stairs instead of the elevator, and sit-stand desks. Safety regards physical safety, such as prevention or reduction of accidents that may damage people, and social safety, by protecting people against theft, burglary, and violent behaviour. Health and safety are strongly regulated by authorities e.g., in Health & Safety Acts, and by national and international standards. Ways to measure health and safety are, for instance, collecting data about absenteeism and sick leave, the number of accidents (per week, month, or annually), self-measurement of health and health supportive behaviour by technical devices, and self-reported complaints in end-user surveys. Nowadays, the WELL Building standard is a widely used tool as well.

Figure 3: Menzis Building, Enschede, the Netherlands. Menzis is a Dutch health insurance company, that puts much effort in providing a healthy work environment, by a healthy indoor climate, physical activity, a sound balance between collaboration and concentration, sufficient rest and relaxation, autonomy in ways of working, and healthy food. Design choices regard, inter alia, a clear zoning system, a variety of (small clusters of) activity-based workplaces, advanced acoustics, relaxation spaces, sit-stand desks, welcoming staircases, living rooms, attractive sanitary provisions, natural forms and materials, a nice outdoor terrace, reduction of travel time, and a focus on people. Photos by Wouter van der Sar. Printed with permission.

4.5. PRODUCTIVITY (DE BEEN, VAN DER VOORDT, AND HAYNES)

Productivity is usually defined as the ratio between output and input, or results and sacrifices, quantitatively and qualitatively. To ensure that a knowledge worker is optimally productive and happy, it is important that he or she can attain personal and organisational objectives, and the environment fits with personal needs. An appropriate physical environment should optimally facilitate both collaboration and concentration, and different moods, from being calm and relaxed to being stressed or excited. Supportive characteristics of the built environment include a spatial layout that supports communication, concentration and privacy, proximity and short walking distances between features that are used frequently, an appropriate indoor climate, a healthy indoor air quality, daylight and outside view, personal control of environmental factors such as temperature, light, and noise levels, and an attractive interior design with ergonomic furniture, nice colours and materials, plants and other greenery. Although measuring the productivity of knowledge workers is not easy, self-rated productivity support by the physical environment and surveys with questions such as to what extent people are able to collaborate and concentrate properly, or the frequency of being distracted, have shown to be highly valuable.

4.6. ADAPTABILITY (GERAEDTS, OLSSON, AND HANSEN)

To enable a high-quality use and a high occupancy rate during its whole life cycle, a building should be able to move along with qualitative and quantitative changes in demands e.g., due to new ways of working, changing needs of the end-users, or new regulations by the government. The adaptive capacity of a building refers to all characteristics that enable it to keep its functionality during the technical life cycle in a sustainable and economically profitable way. A high-level of adaptability also benefits adaptive reuse. Adaptability regards the ability to rearrange, extend or reject (parts of) a location, a building, or a unit, with minimum effort, cost, and disturbance. Design choices that contribute to adaptability include a spatial layout that can accommodate distinct functions, a clear subdivision of a building in different layers (e.g., the support level with a long lifespan and the infill level with a shorter life span), modularity, and construction components that allow reuse and recycling with a minimum of effort and loss of quality. Flex 2.0, an assessment tool with 83 indicators of adaptability of buildings, and lighter versions like Flex 4.0, with 40 performance indicators (Geraedts, 2016), are helpful instruments to identify the demand for adaptability in the briefing and design phase, and to assess the adaptability of buildings in the use phase. These tools also include transformation dynamics indicators from both the perspective of the owner and of the users of a building.

4.7. INNOVATION AND CREATIVITY (APPEL-MEULENBROEK AND NARDELLI)

Innovation and creativity are important prerequisites for the survival and growth of organisations. Worldwide, these value parameters are ranked highly in real estate strategies. For instance, by adopting new workplace concepts that increase knowledge sharing among employees. One of the influencing factors is proximity. Most interactions occur between colleagues sitting within 20-30 metres, with most interactions taking place between colleagues seated within eight metres. Visibility and placement in the room have an impact as well. Central spaces show more unplanned interactions with passers-by. Facilities on campus, such as cafeterias and fitness centres, contribute to inter-organisational interaction. Building design may support creativity by providing inviting settings for meetings and a nurturing environment, communal and private spaces, beauty, window view and sunlight penetration, plants, colours, positive sounds (e.g., music), fresh air, and personal control regarding lighting and noise. People also like opportunities to exhibit the products of innovation and creativity. Ways to measure the impact of design on innovation and creativity are for instance to ask people about their perceived level of support by the built environment and analyse these data in connection to enclosure/openness of the spatial layout of the building, walking distances between employees, level of personal control of indoor climate, the diversity of available workspaces and meeting areas, and perceived quality of visual cues.

4.8. RISK REDUCTION / RISK CONTROL (JENSEN AND REDLEIN)

Risk management regards a proactive approach to cope with future uncertainty and risks that may endanger people, property, financial resources, data and other information. It aims to prevent or limit the consequences of risks, and to implement suitable measures, such as security installations, guarding, and disaster or emergency plans in case of fire or threats by destructive behaviour or terrorist attacks. An interviewee in a biotech company mentioned preventing downtime as extremely important, and compliance to legal requirements to be top priority. In hospitals, reducing the risk of spreading infections is very important and one of the reasons to provide one-person bedrooms. Design choices to decrease the risk of hazards are, for instance, avoidance of harmful products, materials, and substances. Health and well-being, reliability, (data) security, business continuation, and reducing financial risks can be underlying values in risk management. A one-sided view on risk prevention may result in avoiding any risk, despite the favourable probability of success. Ways to assess the costs of risks and risk prevention in buildings-in-use are the total risk expenses, insurance expenses, damage prevention expenses, and actual damage expenses as percentage of company turnover.

4.9. COST REDUCTION / COST EFFECTIVENESS (REDLEIN AND JENSEN)

Cost reduction or cost-effectiveness is often mentioned as one of the three most important value parameters in real estate and facilities management (van der Voordt & Jensen, 2021) and plays an important role in the briefing and design phase of buildings and facilities. Companies with an own FM department tend to have more areas of cost savings than companies without an own FM department. Outsourcing of particular services can also be cost-effective. These findings are mainly relevant for cost-effective management of buildings-in-use. From a client's point of view, the impact of design decisions on investment and running costs are very important as well. Gerritse (2004) analysed the impact of building height and percentage of inside space on building costs. The books by Mann and Mann (1992) and Jaggar and Morton (1995) are quite old but still valuable. Ways to measure the costs of buildings-in-use include the total cost of occupancy per m2, workstation or full time equivalent (fte), space cost per fte, etc., and workplace cost per fte, etc. In the design phase, benchmarking data from earlier projects can support cost-effective design decisions.

4.10. VALUE OF ASSETS (REMØY, HORDIJK, AND APPEL-MEULENBROEK)

The financial value of a building may go down in time, inter alia, due to aging, a changing market demand, trends in society, changes in urban surroundings, or a misfit with new regulations. On the contrary, if it is high-quality, fit for multiple purposes, easy to be adapted, renovated, restructured, or adapted for alternative use, sustainability, and uniqueness, it may keep its value high, and higher than comparable buildings. For this reason, investors and clients may ask designers to incorporate the current and future financial value of the building in their design choices. Common ways to measure the value of assets are a sales comparison approach (analysing the market price of similar buildings), a cost approach (analysing the cost of alternatives of renovation or building new), and an income capitalisation approach (return on investment in the long run). The latter is the most common approach for investment purposes. It is based on an estimate of the annual potential gross income and annual operating expenses, taking vacancy and rent collection losses into consideration. Benchmarking data of the value of different buildings and its design characteristics can be used to incorporate the current and future value of a building in various design decisions.

4.11. SUSTAINABILITY (BALSLEV NIELSEN, JUNGHANS, AND JONES)

Sustainable design and circular building contribute to a reduction of the negative impact of buildings on the environment. For instance, by choosing a location close to public transport, an optimal fit with the criteria of certification systems such as the Building Research Establishment's Environmental Assessment Method (BREEAM) or Leadership in Energy and Environmental Design (LEED), and sustainable equipment. Sustainability is a crucial value dimension in the whole life-cycle of a building, and is influenced by what kind of materials (resources) are used, how the building is produced, components are transported, spaces are used, and how a building is finally disposed of. So, sustainability includes more than energy reduction. In line with the triple People-Planet-Profit or Prosperity, sustainability is also connected to the impact of a building on social well-being and economic benefits to the business, inter alia through reduced maintenance and refurbishment costs. Key Performance Indicators are BREEAM and LEED scores, total CO^2 emissions in tonnes per annum, total energy consumption in kWh per annum, water usage in m^3 per annum, total waste production in tonnes per annum, and land use and ecological value of the site.

4.12. CORPORATE SOCIAL RESPONSIBILITY (CSR) (GROEN, VONK, MELISSEN, AND TERMAAT)

Over recent decades, organisations have become more aware of the social, ecological, and economic consequences of their activities, and seek for ways to incorporate their responsibilities in their governance and be transparent about it. An economic driver is the scarcity of resources, leading to lean processes and cradle-to-cradle principles. Morality has become an important factor as well, both from within organisations and from society. Due to social media, public opinion has gained influence by revealing corporate activities and denouncing misconduct. The internationally recognised ISO 26000 Guidance on Social Responsibility (2010) acknowledges seven principles of social responsibility, namely: accountability, transparency, ethical behaviour, respect for stakeholder interests, respect for the rule of law, respect for international norms of behaviour, and respect for human rights. Other guidance focuses on, inter alia, sustainable development, health, safety and welfare of individuals and society, labour practices, consumer issues, and community involvement and development. These topics may also be used to assess whether designers behave in a social, responsible way and design decisions fit with social, ecological, and economic values.

5. CONFLICTS, SYNERGY, AND PRIORITISING

Values may conflict or strengthen each other. For instance, focussing on cost reduction by reducing space per person may result in decreased employee satisfaction and productivity. An example of synergy between values are healthy workplaces which contribute to health and well-being and also have a positive impact on employee satisfaction, labour productivity, and cost reduction due to less health complaints and sick leave (van der Voordt & Jensen, 2021). The Eye Hospital in Rotterdam is a clear example of synergy between a positive image and the well-being of its patients. Sustainable design will result in reduced demand for resources and reduced waste production and, as such, in lower annual costs, and enhanced competitive advantage because sustainability initiatives are important to attract future staff and customers. Working from a CSR perspective, and taking into account the interests of all stakeholders in a balanced way, may lead to more satisfaction and engagement among employees. In this context, a distinction can be made between intrinsic values, which are valuable for their own sake or are an end in themselves, and instrumental values i.e., values that are instrumental to achieving another good or value (Spiekermann, 2015).

What is highly valued by one person may be ranked lower or less important by another person. Therefore, it is important to identify all stakeholders (Macmillan, 2006) who will benefit from particular design and management choices, and those who are

responsible for the costs and sacrifices. For instance, real estate investors, developers, and shareholders usually focus on return on investment, although completely neglecting other values may result in pricing themselves out of the market. Clients focus on organisational objectives and highly prioritise cost-effectiveness and cost reduction, support of productivity, and satisfaction of employees and customers. End-users focus on usability and prefer an attractive, comfortable, healthy, and stimulating environment. Society may focus on the impact of buildings on the quality of public space, health and well-being, and sustainability. Within an organisation, den Heijer (2012) presents four perspectives: the strategic perspective of policymakers, such as CEOs; the financial perspective of the controllers; the functional perspective of the end-users; and the spatial–technical perspective of property managers and technical specialists. This approach can be zoomed-in to smaller scales, such as business units and departments, and zoomed-out to larger scales, such as umbrella organisations and the society as a whole, local, national, or global.

6. ADDING VALUE AS A PROCESS

In order to integrate Value Adding Management of buildings and facilities in business management and to make it applicable as a decision support tool, Hoendervanger et al. (2017) developed a Value Adding Management process model in four steps (see Figure 2). This model builds on the well-known Deming cycle of Plan-Do-Check-Act (PDCA). The cyclic character emphasises that Value Adding Management is a continuous process. Valuation of output/outcome/added value may be a starting point for alternative choices or new interventions in existing buildings. These four steps may also be useful in value-sensitive design, in connection to common steps in the design process, such as analysis, synthesis, simulation, evaluation, and decision.

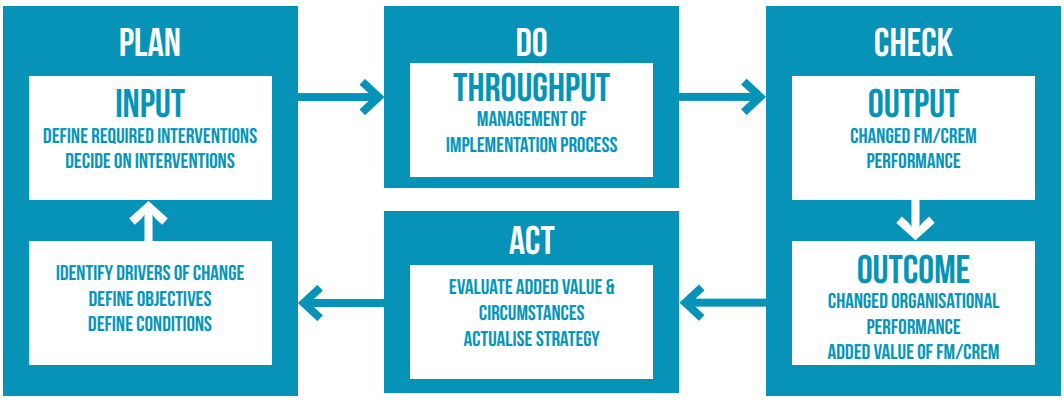

Figure 2: Value Adding Management process model in four steps (Hoendervanger et al., 2017).

The main actions in the Plan phase are to identify the values that should be incorporated in the design phase, and how. This requires an assessment of the main values of all stakeholders, operationalisation of these values in design options (Kroes & van de Poel, 2015), and prioritisation of values, based on level of importance, urgency, practicality, and affordability. The Plan phase ends with well-thought-out decisions about what values will be incorporated, why, and for whom. The Do phase encompasses the implementation of the proposed values in the design process and the design itself, i.e., in a preliminary design, assessment of potential further improvements regarding its support to employee satisfaction, labour productivity, cost-effectiveness, and so on, and implementing these improvements in the final design and construction phase. The Check phase includes an assessment of the costs and benefits of design decisions and its impact on the performance of the client organisation, end-users, and society as a whole, both during the design process and ex-post, in the building-in-use phase. The Act phase is quite similar to the Plan phase but starts from a different situation. Whereas the Plan phase starts with the identification of prioritised values, these values are already known in the Act phase. When all objectives have been attained and maximum value has been added, the Act phase may include acceptance of the design. If the objectives are not sufficiently attained or not optimally, or if too many negative side effects come to the fore, new design options should be considered. Another option is to reconsider the aimed values. It may happen that to attain all values of all stakeholders in an optimal way is not realistic and not feasible in practice, due to limited conditions. If so, then Plan and Do phases start again.

In order to be able to identify whether the aimed values are attained in a particular design or design options and buildings-in-use, values have to be made measurable, as input for a Design Assessment and a Post-Occupancy Evaluation (POE) of buildings-in-use. The former section on twelve value parameters presented a number of ways to measure. In addition, design tools such as Space Syntax may be helpful to assess a design on its usability (see e.g., van der Zwart & van der Voordt, 2015). The Design Quality Indicator may be useful as well (Gan et al., 2003). Friedman et al. (2017) presented 14 value-sensitive design methods that can be used to support the four steps as well: 1) direct and indirect stakeholder analysis; 2) value source analysis; 3) co-evolution of technology and social structure; 4) value scenario; 5) value sketch; 6) value-oriented semi-structured interviews; 7) scalable information dimensions; 8) value-oriented coding manual; 9) value-oriented mock-up, prototype, or field deployment; 10) ethnographically informed inquiry regarding values and technology; 11) model of informed consent online; 12) value dams and flows; 13) value-sensitive action-reflection model; and 14) Envisioning Cards™.

7. TEACHING VALUE-SENSITIVE DESIGN AND MANAGEMENT

This chapter has been written from the perspective of corporate real estate and facilities management. Value-sensitive design and management should go hand in hand and incorporate the values of different stakeholders Where value-sensitive design focuses on ethical and moral values, value-adding management focuses on twelve value parameters from the perspective of clients, end-users, and other stakeholders, with societal values as common values. Sustainability and social corporate responsibility are most strongly connected to ethics and morality. Other communalities between value-sensitive design and management are the plea for transparency, and the need of measuring whether values are attained. Management of buildings and facilities in all phases of the building cycle is increasingly research-based and data-driven. The search for empirical evidence is also key in Evidence Based Design, a renowned concept, in particular in the area of healthcare facilities (Ulrich et al., 2008; Mahmood, 2021). As such, both disciplines may benefit from a multidisciplinary approach.

The concept of value is presented as a multidimensional concept, that incorporates many value parameters. Value is defined as the trade-off between the benefits and burdens of design and management decisions, i.e., between its support of organisational, individual, and societal objectives, and the costs and sacrifices that are needed to attain the aimed benefits. Different values may conflict or strengthen each other. Different stakeholders may have different values and different priorities. The influence of different stakeholders and differently ranked values make value-sensitive design and management rather complex processes. It is not easy to balance different needs, and to cope with the different levels of influence and power of all involved parties. Besides, values are not static but may change, for instance, because of unexpected side-effects, or because new values come to the fore. Therefore, design processes should include a thorough assessment of the main values of all stakeholders, prioritisation of values, and a clear operationalisation of these values in design choices. Transparent discussions in meetings and workshops may be helpful as well.

In an educational context, it is important to make students aware of the concept of value-sensitive design and management of buildings and building related facilities. Awareness of different values and different priorities of clients, end-users, other stakeholders, and society is a prerequisite for socially responsible and user-centred design and management.

In the department of MBE, a particular MSc course is dedicated to corporate real estate management and how to add value by well-thought design and management choices. In addition to lectures and group sessions, students have to write an accommodation plan for a client from practice, based on an analysis of the currently

available real estate, the (mis)match between supply and demand, a stakeholder analysis, and scenario analysis of possible impacts of trends and future developments. Besides, they also have to write an advice on how to transform the current real estate into real estate that better fits with the current and future demands, plus a planning and indication of the costs.

Ways to teach architectural design students how to incorporate value-sensitive design in their design assignments may be:

- Lecturing on value-sensitive design and management of buildings and facilities, i.e., presenting an overview of (added) value theory and buildings in which certain values have been taken into account or are ignored, and the impact on clients, end-users, other stakeholders, and society
- Conducting case studies, individually or in small groups, analysis of precedents and buildings-in-use, both best practices and worst cases, to explore to what extent these cases support different values, and organising sessions to discuss the findings
- Including the explicit incorporation of one or more values in design assignments and asking students to discuss how they cope with these values, what are the benefits and burdens of particular design choices, and for whom, and what generic lessons can be learned from this assignment
- Additional options could be to allocate different values to different (groups of) students, or to ask groups of students to take the perspective of a particular stakeholder as leading in the design considerations
- Group discussions or bilateral discussions between students to reflect on designs from fellow students on their fit with various values, and to compare the design results for similarities and/or dissimilarities

These teaching tools may also help students to explore conflicting and strengthening values. This book and related literature, such as Vermaas et al. (2015) and Friedman et al. (2017) can be very helpful as input to lecturing in design for values, design assignments, assessments of preliminary and final designs, evaluation of buildings-in-use and accommodation strategies, and discussing results.

Another way to involve students in value-sensitive design and management is to incorporate this topic in their graduation project and related graduation research. An interesting topic is the impact of cultural differences. This chapter may be biased by a Western point of view. It is mainly based on European studies and interviews with practitioners from EU countries. Other cultural landscapes may have different

shared values e.g., regarding respect for authority, loyalty to the group, religiousness, male authority, etc. Other research topics are, for instance, a further elaboration of interrelationships between different values, ways to predict whether particular design and management choices will support certain values, and to what extent, and ways to measure the ratio between benefits and costs. The latter is important input for a so-called value-based business case, that goes beyond a one-sided financial focus on return on investment.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

IDENTIFYING INTERVENTIONS FOR RESPONSIBLE INNOVATION: THE SOCIOTECHNICAL VALUE MAP

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ABSTRACT

This chapter presents the sociotechnical value map (STVM) as a method to map out values in a sociotechnical system. To identify these values, the publics that are or can be related to a given technology must be traced. The STVM combines elements from evolutionary theory of technology development and value sensitive design (VSD). It consists of the following steps: first, the relevant societal stakeholders are identified; second, VSD helps us design values into a technology. These findings allow us to reconstruct a sociotechnical public. The chapter examines the elements that make up a STVM, and its underlying theoretical considerations. It concludes by a short discussion on the benefits and shortcomings of the method, and on the reception of students.

SOCIOTECHNICAL VALUE MAP, VALUE SENSITIVE DESIGN, RESPONSIBLE RESEARCH AND INNOVATION, RESPONSIBLE INNOVATION SYSTEM, SOCIOTECHNICAL SYSTEM

1. INTRODUCTION

Any new technology will raise questions about its societal and ethical acceptability (Taebi, 2016). Innovations such as artificial intelligence, genetic engineering, synthetic biology, climate mitigation technologies, and quantum computing all need to be assessed in terms of their use and effects as they create winners and losers, opportunities and challenges. A general tendency appears to be that questions about the acceptability of new technologies are framed in binary terms: technologies are either seen as acceptable or not acceptable, implying that the further development of a certain technology is to be persevered or ought to be stopped. This binary framing of acceptability is unproductive; it would make much more sense to ask under which conditions a new technology can become acceptable.

This chapter introduces a method that allows recommendations about interventions in the development of new technologies to be formulated so that these will become societally and ethically acceptable. This method, called the sociotechnical value map (STVM), is in line with the framework of responsible research and innovation (RRI). This framework, which has been developed in the last decade, combines insights from ethics, science and technology studies (STS), and innovation theory (Taebi, Correljé, Cuppen, Dignum, & Pesch, 2014). RRI aims to contribute to making innovation responsible by providing guidance to researchers and technology developers. As will be more elaborately discussed in the third section, RRI scholars propose that such guidance can take the shape of principles to be taken into account during innovation processes (Owen et al., 2013), or by making sure that the relevant public values are attended to by the new innovation. It is this latter approach that motivates the STVM: the method revolves around the identification of societal values and the incorporation of these values into a sociotechnical system.

2. A NEW SOCIAL CONTRACT FOR INNOVATION

In many cases, societal and moral assessments of new technologies assume the so-called 'linear model' of technology development (see Godin, 2006). In this linear model, the development of a technology is understood as the application of science-based knowledge, and societal ramifications of technology are mainly seen as side-effects that might require some political adjustment, but which do not affect the technology itself. This leads to a responsibility gap: as the application of science, technology becomes conceptually detached from real-world settings, so that no one appears to be responsible for the effects of technology in society (see Latour, 1987; Law & Mol, 2001; Pesch, 2021).

Until half a century ago, no need to challenge the linear model was felt. In general, people appeared to agree upon the positive results of technology development. However, over the last decades awareness has grown that technologies can have adverse effects. As Ulrich Beck (1992) makes clear, technology serves the need to control risks, while technologies themselves also bring about risks. These technological risks prompt us to rethink the idea that technologies, on the whole, yield positive results. Following all these considerations that lead to moral discomfort, Owen et al. (2013) state that we have to develop a new 'social contract for innovation', a new way to think the way society deals with the promises and risks of emerging technologies.

Such a new social contract ought to be based on a range of insights that are developed regarding the actual workings of technology, taking distance from the starting points of the linear model. First, technologies are always 'worldly': there is no technology that exists separately from its actual use. As such, technologies are inevitably part of a sociotechnical system, which not only relates to the artefacts or objects that make up the technology, but also the use of these artefacts by concrete actors in specific societal contexts. Second, technologies are created by people. These people will have interests, beliefs, resources, and so on, that motivate them to contribute to the processes of innovation. Third, technologies have concrete repercussions on our lives. As such, it would make sense to think about the way new technologies are desirable or acceptable, which makes no sense if technology is placed outside of society. Fourth, technology does not only concern the application of scientific findings. In many cases, technologies are made without their developers knowing what the underlying explanations for the technology are.

3. RESPONSIBLE RESEARCH AND INNOVATION

These characteristics underscore the need to reconsider the societal and ethical responsibilities of technology developers. The notion of responsible research and innovation (RRI) aims to address this need. RRI has quickly gained prominence in academic and policy circles, as is evidenced by an increasing range of book and journal publications, funding schemes, research projects, educational programs, etc. (Cuppen, van de Grift, & Pesch, 2019).

According to Armin Grunwald (2014), the notion of responsible research and innovation builds forth on Technology Assessment (TA) and the field of engineering ethics. TA emerged in the 1970s as an early-warning tool to prevent new technologies from having negative effects on society, but over the years this framework has been rearticulated in line with insights developed in Science and Technology Studies (STS), a domain which researches scientific and technological processes as events that are intrinsically socio-cultural (Smits, Leyten, & den Hertog, 1995). The other source of RRI, that of engineering ethics, started with a particular interest in questions for

the responsibility of engineers. For instance, in the creation of nuclear weapons and products that had negative impacts on the environment. Very much resembling the early stages of TA, this initial question for engineering responsibility assumed that technology developed in isolation from society and that moral values only came into play when technologies were applied. However, also in engineering ethics, awareness grew that this is not the case: technologies are not value-neutral, but values are intrinsically embedded in them (Verbeek, 2006; Winner, 1980).

To quite an extent, these two sources return in the main approaches developed in the context of RRI. On the one hand, there are authors who use STS as a point of departure to develop a framework for the governance of innovation (Stilgoe, Owen, & Macnaghten, 2013). On the other hand, we can see authors reasoning in line with engineering ethics, focusing on the question how to design values into the technological artifact or system (Taebi et al., 2014; von Schomberg, 2013). This latter approach furthers ideas about value-sensitive design (VSD) from the field of ICT. VSD aims to create a technological design that adequately incorporates the relevant public values, seeking solutions through design changes. The methodology that is proposed in VSD consists of an iterative tripartite process composed of conceptual, empirical, and technical investigations (Manders-Huits, 2011; Nissenbaum, 2005). The conceptual investigations include the identification and articulation of the central values in a particular design context and the identification of stakeholders that are affected by this design. In the empirical investigations, the findings from the conceptual investigations are used in order to find out how stakeholders experience technologies with regard to the values they consider important. The technological investigation aims to contribute directly to the design and performance of the technology in question, by focusing primarily on the question how the technology can support the human moral values that are found to be relevant.

4. THE SOCIOTECHNICAL VALUE MAP

This paper presents a method that aims to map a technology based on its embeddedness in a sociotechnical system and, at the same time, it will explicitly account for the public values that are to be secured in the design of technologies or surrounding institutional context. This method can be seen as a value-centric extension of Rohracher's approach to mapping a new technology set within the context of a broader sociotechnical system (2002). Rohracher's original idea of mapping a sociotechnical development was aimed at informing strategic policies for the stimulation of new environmentally friendly technologies by using a range of insights derived from STS-literature (Rohracher, 2002: 474). In line with this idea, the STVM is: 1) based on insights from literature on sociotechnical systems; 2) analyses the development of the technology; 3) forecasts the eventual hindrances for the further development

of the technology; and 4) gives options for interventions in the development of the technology – in case of the STVM, this is done by identifying the relevant values and by giving suggestions about how to design these values into the technological system. The added value of the STVM compared to VSD is that it considers a technology as embedded in an existing socio-technical system and with that does not separate a technology from its wider context.

Drawing up the STVM entails a number of steps that are introduced below. The first of these steps involves the formulation of a technology map, which can be seen as a description of the technology itself, and of the technical and institutional networks in which this technology is developed. The second step is that of the stakeholder map, in which the actors are identified that are or can be affected by the technology. The third step concerns the value map, in this map the values that can be connected to the technology and the stakeholders need to be identified. Having an oversight of these technical, social and moral implications of the technology that is in development allows for the possible interventions in the development of the technology that allow for values to be attended. These interventions can be seen as recommendations for making the innovation more responsible.

The full STVM can be represented in Figure 1.

Below, these four steps are further elaborated. This is done by firstly introducing the theoretical notions that underpin these steps, and secondly by outlining the information that is to be collected in order to construct a STVM.

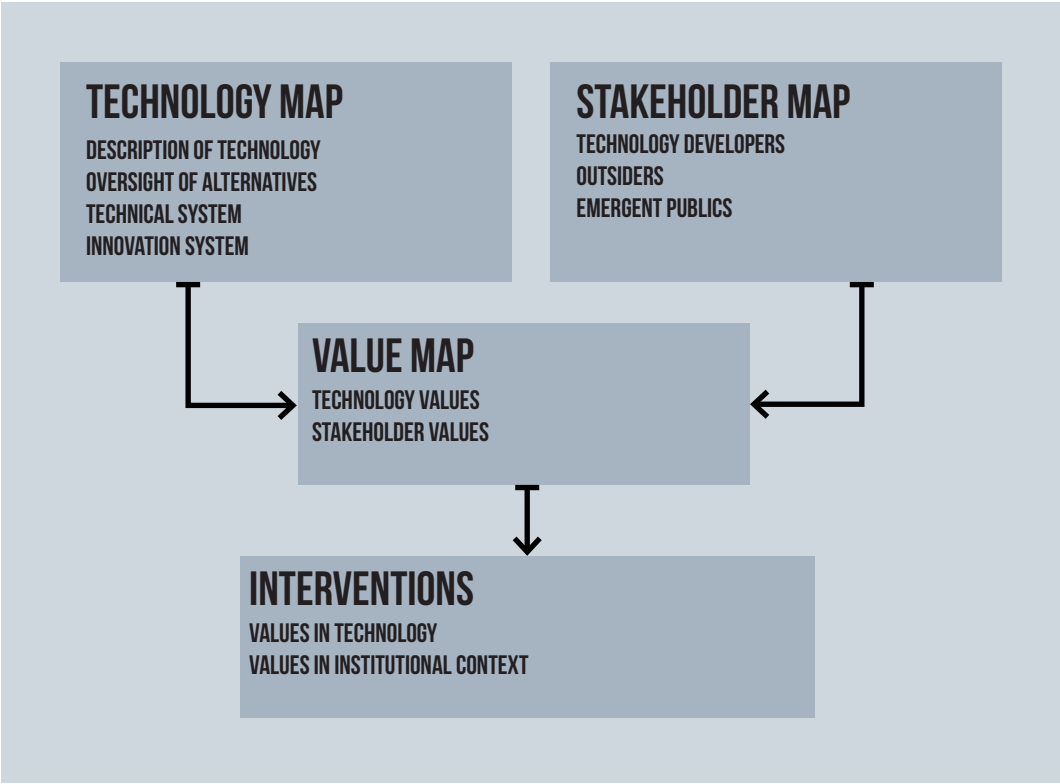

Figure 1: The steps of the Sociotechnical Value Map. Diagram by author.

5. MAPPING THE TECHNOLOGY

The STVM assumes a technological development to involve a sequence of confrontations between technology developers and society. This sequence of confrontations can also be described in terms of variation and selection, like evolutionary processes in biology, as is done in the theory of evolutionary economics (Dosi & Nelson, 1994). Evolutionary economics is grounded in the work of Joseph Schumpeter (2000 [1942]) who portrayed the market as a system in which entrepreneurs have to develop new technologies to gain a business advantage over their competitors. According to Dosi and Winter (1994), the aggregate outcome of these entrepreneurial activities resembles an evolutionary process: the entrepreneurs are, together with actors like engineers and companies, part of a variation environment in which variations of new technological designs are developed. On the other side, there is the selection environment, composed of consumers, regulators, and so on, who decide which of the technological variations are chosen, and as such decide which alternatives eventually become successful.

This evolutionary account informs us that innovations do not start from scratch. Instead, they are created against the background of an already existing sociotechnical system. Innovations can be seen as variations to existing technologies that inform expectations about successful ways to overcome certain understandings of societal problems. This means that, the way an innovation trajectory will branch off is not only a technical matter, it is based instead on what people believe with regards to the new technology or what they are used to. Think for instance about the development of electric vehicles or self-driving cars. These technologies are explicitly constructed as alternatives to the dominant design of the passenger car. How cars look and how cars function are based on the expectations that are motivated by the traditional car, in which there are two seats in the front and a bench in the back, an engine, which has to be filled up for fuel every 500 kilometres or so, which has two brightly shining headlights and two clear red taillights, etc. New types of personal transport are designed in order to fit this mental model (Dosi & Nelson, 1994), even though the technical capacities of these new types would allow totally new paradigms – such as autonomous vehicles without lights as proposed by Stone at al. (2020). The fact that such ideas can be considered as out-of-the-box, testifies that both producers and users are generally guided by what they are used to and by the full range of possibilities.

To describe the way a technology is connected to other, existing technologies, the notion of technical systems is used. This notion, introduced by Thomas Hughes (1983; 1987), takes the interdependence of technologies as its starting point. Technical systems are especially recognisable in network technologies, such as electricity systems, infrastructures and ICT. These systems are based on the connection

between different components that are geared towards a common goal. Because of these connections, the technologies that are part of the technical system have a strong influence on each other, but also on the system as a whole. In fact, specific technologies or social factors may hamper the further growth of a sociotechnical system, as they lag behind the development of the full system. Inventors, engineers, entrepreneurs, and others often direct their creative and constructive efforts mainly at overcoming these obstructions by redefining them into solvable social or technical challenges. With that, such problem definitions will be translated into new technological designs and new social arrangements that are aimed to resolve the problems at hand. In our analysis of the history of a technology, we may observe a series of bifurcations: moments in which a specific development of the technology is further taken up at the expense of alternative approaches.

The role of problem definitions directs us to the impact of beliefs in the development of new technologies. We tend to think of technology as things that are essentially tangible: instruments, tools, artefacts, infrastructures, and so on. Moreover, when we talk about future technologies, we first seem to think about its physical appearance. Future technologies, however, do not exist in empirical reality, they only exist as conceptual entities (Pesch, 2015). In the words of Jasanoff and Kim (2009), they are *elements of* 'sociotechnical imaginaries': representations of a future sociotechnical system in which a new technology will become embedded. In the realm of technology, such future visions shape trajectories of research and innovation and with that they become performative: they create their own reality like self-fulfilling promises (Borup, Brown, Konrad, & Van Lente, 2006; Brown & Michael, 2003; Selin, 2008). The awareness that technological development starts with the creation, articulation, and dissemination of expectations, prompts us to look at the software of technology development, instead of looking at the hardware. Talking about responsible innovation is akin to talking about things that are not there, and, in most cases, is akin to talking about things whose possible existence we are not sure of, and if they will come to exist, what they will look like, how they will be used, and what the impact of their use will be.

Expectations do not emerge out of thin air; they are the result of human agency. In technology development, the construction of expectations often is a deliberate form of activity. Actors strategically raise expectations by promising that a new technology allows them to solve current or future practical problems, they do so in order to mobilise resources for their work. Engineers, scientists, and technology developers try to appeal to an audience of actors who can provide the financial means, time, policy support, and/or organisational capacity to substantiate the technology. Moreover, technological promises and the construction of visions helps coordinate actions by various stakeholders (Dierkes, Hoffmann, & Marz, 1996; Grin, 2000; Quist, 2007). If people share expectations about the future, including the role that a technology-to-be

will play, they can adjust their activities to that imagined future. Once the awareness about the constitutive role of promises is there, examples are easily found. For instance, the allocation of resources in new technology is often justified by pointing at the possible development of new medical drugs, for instance in the case of quantum computing, artificial intelligence, nanotechnology, etc. Also salient is the belief that digitalisation will lead to more efficient business and policy processes, or that financial innovations such as blockchain will eradicate transaction costs, as when the internet promised to give rise to a 'friction-free economy' (Pesch & Ishmaev, 2019).

The development of beliefs about a future technology takes place within an innovation system, which can be seen as the institutional context which contains the resources necessary to develop new technologies (Carlsson, Jacobsson, Holmén, & Rickne, 2002; Hekkert, Suurs, Negro, Kuhlmann, & Smits, 2007). This innovation system includes the linkages between knowledge institutes, industrial networks and governmental agencies appear as most relevant, and available resources such as knowledge, investments and legitimacy have to be aligned as optimally as possible (see Cunningham & Werker, 2012; Sovacool & Hess, 2017).

This innovation system accommodates the so-called 'insiders' or 'technology enactors' (Garud & Ahlstrom, 1997). These are the actors that are directly involved in the process of technology development, not only the technology developers, but also those actors that make up the 'innovation system', which includes for instance investors, researchers and policy-makers. The questions are, what knowledge, finance, political leverage and so on do insiders have and use to turn an idea into something real, and what are the beliefs about the future of the technology.

Taken together these theoretical considerations give rise to the following elements that make up the technology map.

A DESCRIPTION OF THE TECHNOLOGY AND AN OVERSIGHT OF TECHNICAL ALTERNATIVES

First, it is necessary shown what the character of the technology is. Is it a product or a service, an artefact, a system, or is it a concept that combines different technological developments?

How far is the technology in its development? Is it just an idea, is there a prototype? What is the history of the technological development? What are the various performance standards: so how much will it cost; what are environmental (dis)advantages; how safe is it?

The technical alternatives that are available on the market or under development also have to be presented here. If possible, a hierarchy of technical alternatives should be determined and an indication of what determines the selection of alternatives should be presented.

THE TECHNICAL SYSTEM

How can the technology be seen as part of a technical system? What is the speed of development of this system, and what are the factors that hamper its further development? Apart from the connection with other technologies, the connection to existing or likely regulation and legal arrangements must also be made explicit. For instance, are there or will there be laws that prevent or stimulate the further success of the technology? Also, think about appropriation: will a company decide to apply for patents so that its specifics have to be published? Will the company try to keep its technology secret? Or will it make its findings accessible for everyone without further ado?

THE INNOVATION SYSTEM

The activities of the actors described above take place against the background of an innovation system that figures as the general environment in which the new technology is produced. To depict the innovation system, we have to sketch out the characteristics of industry, policy, and science and we have to indicate their relationships in the context of the technology development at stake. Which parties can be recognised, what do these parties do, and how do these parties interact? What are the capacities for resource mobilisation? Does the innovation system give rise to the concerted creation of expectations and problem definitions, for instance by the development of supporting policies, business strategies, or scientific programmes? In the description of the innovation system, it is important to make a geographical delineation, so as to allow for empirical detail and a fine-grained analysis.

6. MAPPING THE STAKEHOLDERS

The second step of the STVM concerns the stakeholder map, which focuses on the actors that are possibly affected by the new technology. The goal of this part of the STVM is to sketch out the way by which a heterogeneity of societal actors plays a role in the assessment of a technology and may have the ability to stimulate or hamper the further uptake of that technology. In other words, a new technology may become a subject of contention in a social arena, so that the development of a technology is impacted in each and every aspect.

Above, we have looked at the role of insiders. However, innovation is also influenced by 'outsiders' that are not represented in the innovation system, but which will be affected by the new technology. Van de Poel (2000: 384) defines such outsiders as actors that are outside the network in which technical development is taking

place. Van de Poel identifies the following categories of outsiders: 1) outsider firms; 2) professional engineers and scientists; and 3) societal pressure groups. Outsider firms can be companies that enter a market by providing an alternative technology. One may for instance think about how Google wallet or Apple pay aim to play a role in the financial sector. Professional engineers and scientists may develop new knowledge or products that affect the dominant production or use of a certain technology. What these two categories most basically do is to introduce an additional problem definition, which might have a profound impact on the further development and uptake of a technology. The third category of outsiders, that of societal pressure groups, is most notably populated by NGOs, a category that is especially relevant as these groups may mobilise public opinion or influence government and users, endorsing specific sets of values that as such may become relevant for the technology.

With regards to this last category of outsiders, we should not only look at societal pressure groups, but also at the roles that members from the general public can have. These actors may take on the role of protestors, for instance, if they contest the implementation of technologies like wind power, shale gas, or carbon capture and storage – at times leading to the termination of technology projects (Cuppen, Brunsting, Pesch, & Feenstra, 2015). Another role of the public is that of the public-as-producers of new technology (Pesch, Spekkink, & Quist, 2019). In the field of energy production, for instance, we can observe the emergence of so-called prosumers: citizens that produce their own energy, not only by making use of existing technology such as solar power or heat pumps, but also by developing new sociotechnical arrangements. A similar role of the public can be retraced in the notion of 'open innovation' (Chesbrough & Crowther, 2006; Von Hippel, 2009), which highlights the capacity of actors outside of the main arenas of technology development to contribute to innovation. In short, members from the general public have to be included because innovation affects their lifeworld and as such have to be consulted from a democratic point of view; resistance of the public can lead to the cancellation of new technologies that may benefit society as a whole; and because the public can contribute to innovation. But how can you identify the public? How can you find actors and voices if they are not organised? This is a fundamental conundrum that cannot be solved, but only circumvented, for instance, by looking at social controversies that urge a diversity of actors to articulate their interests, knowledge, values, and so on (Rip, 1986). The problem here is that an analyst has to discuss possible courses of action, relying on analogy or conjecture instead of on material that can be retrieved from existing empirical sources.

THE TECHNOLOGY DEVELOPERS

Here, the actors that are directly involved in the creation of the technology have to be identified. So, who are the scientists that have worked on the knowledge-base of the technology, which companies or state organisations are involved in its development? What are the activities that are embarked on? What also has to be addressed are the beliefs, expectations, promises, and problem definitions that are held by the technology developers, and which figure as the reasons for them to designate resources to the innovation process: so, what are the promises that have been raised for this technology, and by whom are these championed; what is the problem or need the new technology is intended to resolve; what are the expectations that vigour with regards to the technology?

THE OUTSIDERS

The innovation system presents the actors that can be seen as insiders, but as stated, it is also important to include the outsiders in our analysis. Not only because it is essential for responsible innovation to include a wide range of actors and a diversity of voices in the decision-making process on the technology, but also because outsiders may have a significant impact on the technology-to-be, for instance, by presenting alternative problem definitions and understandings that challenge the problem definition of the insiders. As such, first the NGOs, competing firms, and outsider engineers and scientists that forward alternative problem definitions and solutions with regards to the technology at stake need to be identified. It needs to be reflected upon how these competing definitions and solutions can have an impact on the further development of the technology at stake, for instance by taking their legitimacy into account, but also by looking at the respective powers of these parties. Do they have the leverage to change the process of technology development?

THE EMERGENT PUBLICS

The general public can be seen as a special category of outsiders. Unlike the parties shown above, the public is fundamentally intangible, as you just never know whether a new group of actors will emerge and try to influence the development of a technology. The identification of the innovation system and of the outsiders can be based on retrospective empirical research, but with regards to groups that emerge from the general public, one can only be explorative, for instance, by looking at potential societal challenges, and by taking account of the roles that the public can play as user, protestor or producer.

7. MAPPING THE VALUES

In the value map, the values of the actors described in the previous part are identified. The first two parts of the STVM are primarily empirical exercises, aimed at gathering and organising the right material from social reality. In the value map, a coherent interpretation of these empirical results needs to be made. The values that are affected by the technology, and the values that are forwarded by the stakeholders have to be analysed so that the author of the STVM may provide concrete recommendations for designing these values into the sociotechnical system, the following step of the STVM.

In this, it needs to be acknowledged that it is an intrinsic feature of technologies to be imbued with values. They are designed to fulfil certain functionalities, also based on implicit normative ideas of the technology developers. In the design of a new technology, designers use certain images or representations of their 'target audience'. Often these images or representations are only held unconsciously by the designers, but they have the effect that certain tastes, competences, motives, aspirations, and prejudices become inscribed in the artefact (Akrich, 1992; Oudshoorn, Saetnan, & Lie, 2002). We may also derive insights here from 'actor network-theory' (ANT). This approach emphasises that, and explains why, objects cannot be seen as neutral with respect to moral and social behaviour (Latour, 1992). Think for instance of a speed bump, this is not just a value-neutral object, but it is something that imposes a rule upon us – instructing us not to drive too fast. A speed sign is an artefact with the same function, but it does not compel us to drive slowly at the extent of physical unease. It does so by appealing to our morality. As such, technologies mediate values and affordances, making us act in certain ways (Verbeek, 2006). In many ways, the objects of technology are strongly value-laden, as they incorporate certain (often dominant) values while failing to represent others. Furthermore, they may also give rise to new types of behaviour, and with that they also lead to new expectations and new sets of values.

In order to retrace values, the 'value hierarchy' (van de Poel, 2014) can be used. At the highest – most abstract – level, there are fundamental values someone may hold paramount, such as safety, environmental friendliness, economic efficiency, and so forth. Contestations do not (often) arise from what constitutes a value. Everybody will supposedly endorse abstract values like safety, equity, and efficiency. Rather, controversy arises from how the value is specified into norms. Norms are located at the second level of hierarchy and form prescriptions for or restrictions on actions. Such norms may include objectives (like 'maximise safety', 'safeguard the environment', or 'minimise costs' without a specific target), goals that specify a more tangible target, and constraints that set boundaries or minimum conditions. The bottom level of the value hierarchy, which is also the most concrete one, indicates the tech-

nical and institutional design requirements that are derived from the norms. Van de Poel (2014) applies this hierarchy to the case of chicken husbandries, where the general value of animal welfare is translated into the norms of living space, the ability to lay eggs, to take dust baths, and rest on perches. Subsequently, these norms are operationalised in the design requirements which indicate the space in square centimetres, the number of chickens per square meter, the materials and shape of the battery cage.

The value hierarchy can be used both as an analytical tool and as a design tool. As an analytical tool, it can help to analyse why, or for the sake of what, something is being done or preferred by someone. It can help to explicate the values that underlie certain decisions or characteristics of a design and it can help to illuminate controversies when values and/or norms were specified in the design process but not incorporated in the design. As a design tool, the value hierarchy can be used to come up with a design that is robust in the sense that it can bring together divergent values and norms into a coherent set of design requirements.

THE VALUES OF THE TECHNOLOGY

Based on the analysis of the functional characteristics of the technology, an analysis in terms of values can be made. It has to be addressed which values are intended to be effectuated by the new technology or which values have already become embedded in the design. It also needs to be addressed whether these technological values may change in the further development of a sociotechnical system.

THE VALUES OF THE PUBLIC

Based on the stakeholder map, the public values can be charted out. The problem definitions, viewpoints, arguments of all stakeholders have to be rearticulated in values – making use of the value hierarchy. Not only must these values be rearticulated, it is also necessary to present how the different stakeholders relate to these values, how different stakeholders understand the different values, and whether there are any conflicts between the values themselves or between different understandings of the values.

8. INTERVENTIONS FOR RESPONSIBLE INNOVATION

The fourth step of the STVM explores how the relevant values can be designed into the technology. The main question that needs to be addressed is how the new technology can be implemented in a responsible way by addressing values that are found to be relevant. This is far from an easy task as in many cases the values will be conflicting, and embedding the full set of values in a design may be impossible. With the right analysis, however, one may identify the minimum set of values, which are the minimum values that need to be incorporated into the design in order to make the technology successful. In other cases, a clever design that solves value conflicts may be constructed. For instance, using new composite materials allows aeroplanes to be both strong and lightweight, so the values of safety and sustainability are both catered to.

The main idea of VSD is that values can be attended to in the design of a technological artefact. It seems sensible, however, to extend the scope of design and also consider the redesign of institutional contexts in which technologies are embedded. Two categories of institutions can be distinguished: 1) formal institutions such as laws, standards, regulations, and contracts; and 2) informal institutions such as customs, traditions, and routines. Many of these institutions, especially the formal ones, may be subjected to redesign to accommodate divergent values (Correljé & Groenewegen, 2009). Before thinking about interventions in institutional context, we can think for instance about changes in the innovation system, the direction of the development of a technology may be influenced directly. Policies may be created that aim to 'nudge' the demand side of the system (Edler & Georghiou, 2007; Tödtling & Trippl, 2005). This can be done by direct regulation, which in general pertains to sectors that are considered to serve some public good, such as health, education, or infrastructure (Blind, 2012). Public organisations can also aim to influence the direction of innovation by changing the demand side, for instance, by public procurement that is believed to stimulate companies to develop products that fulfil societal needs (Aschhoff & Sofka, 2009). We can also think of effective forms of participatory decision making, based on dialogue, compensation and ownership arrangements, and so on (Pesch, Correljé, Cuppen, & Taebi, 2017).

A second approach is to shelter new innovations against evolutionary pressures such as R&D laboratories, subsidised demonstration projects, or small market niches where users have special demands and are willing to support emerging innovations (Kemp, Schot, & Hoogma, 1998; Schot & Geels, 2008). The deliberate creation of niches has been given the name of strategic niche management (SNM), an approach that aims to use the niche to instigate various learning processes that will create a stable sociotechnical configuration that challenges the dominant regimes. Such niches can be considered as breeding grounds for innovation, safe places where innovations

can be tried, tested, and mature. Whereas large, often long-term changes are difficult to design, manage, and control, niches do promise a certain level of influence and control. The aim is to create a level playing field for sustainable innovations; once they flourish, they can compete with alternative, mainstream technologies.

An important way to bring in public values is by involving the public itself through participatory methods in innovation processes (Hagendijk & Irwin, 2006; Pellizzoni, 2003; van Oudheusden, 2014). With regards to innovation, participation is usually organised within the tradition of technology assessment (Decker & Ladikas, 2004; Smits et al., 1995). Modern versions of TA include a wide range of participatory methods for involving stakeholders in decisions about technology (Felt et al., 2013). Among the most elaborate of these methods is constructive technology assessment (CTA), which tackles the pathologies of the linear model by organising 'bridging events' between the 'enactors' that develop new technology and the 'selectors' who will be affected somehow by this technology (te Kulve & Rip, 2011). By organising the joint articulation of needs, expectations, world views, values, and so on, technologies can be developed in a way that adheres more directly to the needs and values of society.

VALUES IN THE TECHNOLOGICAL DESIGN

Here, we need to explore whether there are any values and/or norms missing in the current technological design, and we need to question how these can be specified into design requirements.

VALUES IN THE INSTITUTIONAL CONTEXT

Are there any values and/or norms missing in the current institutional context? How can these be specified into design requirements? The institutional context includes the processes in which the different groups of stakeholders interact, which may not only be seen as contexts that are open for redesign, but also as processes in which the stakeholders can articulate their values even further.

POSSIBLE INTERVENTION STRATEGIES

What can the actors that make up the innovation system do to make the technology aligned with the values identified above? How can these actors make innovation more responsible by accommodating the values of the sociotechnical public and what other policy options allow the increase of responsiveness regarding the innovation under study?

9. CONCLUSION

The sociotechnical value map provides a systematic and comprehensive method to identify values and to design these values into a sociotechnical system. The benefit of the method is that it takes a broad scope towards technology, by embedding it in institutions and practices, instead of regarding a technology as an isolated artefact or design. Moreover, the STVM highlights the societal and institutional dynamics that characterise innovation processes. It sketches out technology development as something imagined, created, and used by people. These features seem self-evident, but are surprisingly often overlooked.

In this chapter, a limited number of examples have been given, but in principle the STVM can be used to analyse any technology. The scale of technologies will obviously differ, as well as their manifestation, but every technology relies on the commitment of financial and institutional resources, as well as beliefs. Many students at different courses at the Delft University of Technology have been given the STVM as an assignment, and the students have chosen a wide variety of technologies, producing valuable insights into how innovations can be understood and be more responsive to societal and moral demands. Moreover, students have reacted very enthusiastically to this assignment. In course evaluations, they have indicated that it has been both fun and instructive to approach a technology from this perspective, which for them, implies another way of looking at technologies and their role in society.

In this, it needs to be added that the STVM is a snapshot: it pertains to only one moment in time. At the same time, it should be emphasised that technology is always a work-in-progress. There is no finite design, not only because technologies will evolve further, but also, and perhaps more importantly, because society will always be subject to change. This means that the connection between values and technology is fundamentally volatile.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

SECTION

3

PRACTICES

TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

MORE THAN HALF THE PICTURE: CHALLENGES AT THE ENCOUNTER OF FEMINISM AND ARCHITECTURAL HISTORY

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ABSTRACT

Historically, the work of white Western male architects has dominated architectural history education. In recent decades a large body of scholarship has attempted to critically question this, highlighting and subverting mainstream disciplinary values, which are informed by gendered, racial, classist, and colonial biases. This chapter explores the process of addressing the methodologically and epistemologically gendered blind spots that reinforce structural inequality in the academy. We reflect on our experiences developing two interlinked Architectural History courses on the MSc Architecture, Urbanism and Building Sciences between 2019 and 2021 at Delft University of Technology (TU Delft). The chapter explores the challenge of introducing traditionally marginalised forms of architectural knowledge – such as ones coming from feminist theory – within an existing institutional framework, while also interrogating the essential acts of collaboration between students, researchers, and teachers that take place in the process.

ARCHITECTURE, ARCHITECTURAL HISTORY, FEMINISM, GENDER BIAS, SEMINAR

1. INTRODUCTION

'Write yourself. Your body must be heard' says Hélène Cixous (1976: 880). A new period of intensification of feminist awareness is changing the way we live in the world. This 'fourth wave' of feminism has been identified by several scholars in different English- and Spanish-speaking contexts (Munro, 2013; Cobo, 2018), among others, as a 'global' or 'mass' movement spread via social and other forms of media and activist movements across the world in the first decades of the twenty-first century. Defined by the complex contemporary context of globalisation, the emergence and urgency of intersectional feminism, and serious crises of climate and care-work, the movement is inexorably changing all areas of life and every field of knowledge, including architecture and the built environment. In doing so, it has brought into focus the ways that specific (patriarchal) value hierarchies have reinforced inequality within the architectural profession. Such structures are rooted in the academy, as the first place that professionals encounter ideas of professionalism, excellence, and the filtering of 'ideal' practitioners (Brown et al., 2016).

Feminist movements started to transform architectural debates in the last decades of the twentieth century, as feminist practitioners and academics sought to challenge the barriers faced by women within the profession, as well as the exclusion of women and traditionally oppressed peoples from the history of architecture. Such work mainly took place following the second wave of feminism in the 1970s. Yet, the productive outcomes that arose from intersections between feminist theory and architecture remained outside the status quo, and were received with hostility within a highly masculinised academic and professional field. Feminists from an earlier generation had to wait for the progressive feminisation of architectural training and practice (i.e., the establishment of a critical mass), the career-advancement of some female academics, and the emergence of a more sympathetic societal context, to see the wider impact of their efforts. The brilliant work of these scholars in challenging and critiquing the 'universal' norms and values inherent within architectural history has become all the more pertinent in the information age as the 2010s saw the arrival of collectively built online databases and repositories such as *Un dia/una arquitecta* (launched in 2015, see Moisset 2017; 2018), *Pioneering Women in American Architecture* (launched in 2017), *Women Write Architecture* (launched in 2017), and *Women Writing Architecture* (launched in 2021), not to mention the various Wikipedia 'edit-a-thons' adding women in architecture. The latter, in particular, contributed to a major transformation of Wikipedia's database, where 90% of editors were male (Moisset, 2017, p.21) and whose consequent gender bias was publicly acknowledged by the organisation in their own article 'Gender bias on Wikipedia'. As Despina

Stratigakos wrote in 2016, this situation certified that '[history] is not a simple meritocracy: it is a narrative of the past written and revised —or not written at all— by people with agendas' (2016, p.65).

Critical to the diversifying of architectural education in recent years has been the questioning of the 'canon' in architectural schools across the world. Founded on the Anglo-European traditions of art institutions in the nineteenth century, the canon —a selection of the most important architects and their works in architectural history— remains the cornerstone of much architectural education today. Through the canon, exclusive practices, based on colonialist European power structures, are normalised in the academy through the selection of precedent studies, text books, exhibitions, invited speakers, and curricula, and consequently in the architectural profession.

A profound contribution of feminist architectural historians has been to address and critique this canon through edited volumes, which have become important and helpful alternative 'readers' in the classroom. Iain Borden, Barbara Penner, and Jane Rendell's influential publication *Gender Space Architecture* (2000) revealed how the discussions on gender and architecture have developed since the 1970s; where feminist scholars had initially been concerned with professional issues, such as the underrepresentation of women architects, protecting their heritage, and scrutinising the 'man-made' environment. The 1980s and 1990s revealed a shift into interdisciplinary work (such as anthropology, film studies, and cultural studies), exploring the spheres of experience and representation, while at the same time, architectural history began to explore the ways that architecture creates subjects. As Penner notes, Beatriz Colomina's essay 'The Split Wall: Domestic Voyeurism' in her book *Sexuality and Space* (1992) represented a fundamental shift in architectural history, as 'it made the case that gender (and other forms of difference) is actively produced and reproduced by architecture' (Penner, 2005, p.89). Since the intersectional approach to feminism gained strength during recent decades, there have been numerous endeavours to both break and remake the canon through edited volumes that explore different facets of feminist architectural history, including: ecological feminism (Rawes, 2013; Frichot et al., 2017), migration (Lee & Siddiqi, 2019; 2021), race (Cheng et al., 2020), and disability (Boys, 2014; 2017). Other recent broad scope publications, such as Zaida Muxí Martínez's *Beyond the Threshold: Women, houses, and cities* (in Spanish 2018, translated to English in 2020), the four volume *Women in Architecture* (edited by Sumita Singha, 2018), and the forthcoming *Bloomsbury Global Encyclopaedia of Women in Architecture, 1960-2015* (edited by Lori Brown and Karen Burns, forthcoming) offer resources to question the deeply established methodological and epistemological gender bias in Western architectural history.

But writing takes time. It takes time to produce and to disseminate, percolate and transform our institutions. It is in this lag that we continue to consciously and unconsciously reproduce long-standing narratives that only see less than half the picture.

Such narratives have serious structural and policy-based repercussions for our universities. Data shows that despite gender parity in most architecture schools among students, the situation is not good for women in practice. In the Netherlands, approximately 25% of registered architects are women (Architectenregister 2021), despite roughly equal numbers of female and male students at the country's top two architecture schools. While this process of attrition is inevitably linked to structural-societal factors (gendered division of work, parental leave policies, pay discrimination), there are other issues directly emanating from the culture of the profession. The UK's *Architectural Review* 2016 'Women in Architecture Survey' found that 83% of EU female architects saw having children as disadvantaging their career (44% said that architecture was a good career if you didn't have children), 72% experienced sexual discrimination on building sites, and 52% encountered discrimination in meetings (Tether, 2016). The situation for women of colour is undoubtedly worse, whereby commonplace issues, such as pay imbalance, lack of job security, and harassment, are exacerbated by racial discrimination and structural racism (Fairs, 2017; Mark, 2017). While there have been some highly valuable initiatives to understand inequality within the profession, such as the Parlour platform in Australia (https://parlour.org.au, launched 2012), at present we lack detailed scientific or broadly cultural research into the problems experienced by women and people of colour in architecture, or of effective measures to improve the situation (Brown et al., 2016).

Although it is not possible to attribute all of these problems to the academy, educational culture certainly has a part to play. In recent years, urged by their students, educators have begun to realise the importance of addressing equality, diversity, and inclusion (EDI) as a set of values that need to be explicitly explored within the educational context, and in doing so to re-assess certain 'tropes' of the architecture school that reinforce exclusivity and exclusion, such as: a single (white male) genius designer as the benchmark of excellence, the long hours working culture, highly public and highly aggressive 'crits' of student work, uncritical use of the canon, and elitist recruitment practices.

As self-proclaimed feminist students first, who subsequently became scholars and then teachers, we are deeply invested in contributing to such a paradigm shift. In the search for answers, we have for some years been actively studying, participating, and collaborating to find a way to establish both a theoretical and practical approach to the problem. This chapter presents our experience and situated knowledge (Haraway, 1988) gained at the Department of Architecture in the Faculty of Architecture and the Built Environment of Delft University of Technology (TU Delft) after our encounter in 2017 at the History of Architecture and Urban Planning Chair headed by the then only female full professor, Carola Hein. We begin by outlining the context of the department and the initiatives already in place, then move on to discussing our own experiences of putting together courses that aim to foreground

equality, diversity, and inclusion as explicit values. Our goal with this paper is to show both the problems and opportunities with EDI in the architectural context, to acknowledge and amplify the existing work in this field, and to share our insights from the experience in the hope that they may encourage others to act.

2. LESS THAN HALF THE PICTURE: THE BACKGROUND

At the Faculty of Architecture and the Built Environment, declared feminist activism has been present, though not always appraised, since at least the 1970s. As TU Delft researcher Charlotte van Wijk writes, second wave feminism had an impact on Dutch universities through the initiatives of students (predominantly from the social and historical sciences), who established 'sections for Women Studies at their faculties' from around 1974. '[From] the late 1970s onward', writes van Wijk, 'women active in the academic field of Women's Studies, or involved in the women's movement, showed increasing interest in the subjects of architecture and urban planning' (2018). At the faculty, the Women's Studies section was created in 1978 and remained active until the late 1990s, during which time it worked to fight against women's oppression in the profession (see relevant history theses by Alkemade (2018) and Andriessen (2021)).

Since then, there are no records of active feminist groups until the TU Delft Feminists emerged on the Campus in the mid-2010s (ceasing activity in the Faculty of Architecture around 2018). In 2015, a fictional *BNieuws #EI* (the magazine of the faculty) ironically welcomed 'Carlota Pérez', the woman to be appointed Dean of the faculty and published a piece on how Eileen Gray had rejected the Pritzker Prize (Het Grijze Ij, 2015). The TU Delft Feminists, whose Facebook group has been active since April 2016, described itself in its Wordpress website as a 'grassroots and horizontal organization for intersectional feminism led by students, PhDs and researchers at the TU Delft'. As part of their activities at the faculty, the group organised a book club, several actions and events, including a response to the all-male panel invited to celebrate Jane Jacobs legacy on 24 May, 2016, and the organisation of the Diversity Talks in 2018. The TU Delft Feminists were also the first group to draw attention (and offer alternatives) to the unequal representation of white men in the historical education within the faculty, most explicitly manifested by the permanent exhibition of portraits in the corridor of the Department of Architecture. This exhibition displayed a posthumous tribute to 80 unidentified deceased architects. The composition of the exhibition revealed the stark epistemic biases at play: 72 were men and only 3 were non-white (Figures 1 and 2). Through time, the antipathy towards the exhibition grew as living proof of normalised inequalities in architectural pedagogies.

Figure 1. The permanent exhibition in the corridor at the Department of Architecture. Photo by María Novas-Ferradás, 2018.

Figure 2. Portraits at the permanent exhibition in the corridor at the Department of Architecture. Photo by María Novas-Ferradás, 2018.

Although not yet commonly archived or documented, students' work for diversity proved to be crucial to boost future events in the faculty (Heinrich & da Porciúncula Paias, 2022). In 2017, students from a variety of student organizations including Catherine Koekoek, Xie Hai, Nihat Mert Ogut, Meryam Ajary and Ijsbrand Heering edited the report Ground For Discussion: Inclusiveness. The report presented the results of interviews, a survey, an event and a letter to the Dean (Koekoek et al. 2017). After some time, i.e., on 16 May, 2018, a workshop and discussion forum took place. The public workshop Building Diversity (Figure 3), organised by Amy Thomas in association with the BauHow5 Alliance, aimed 'for an open and critical discussion about

Figure 3. Building Diversity workshop on 16 May, 2018. Poster by María Novas-Ferradás and Ollie Palmer, 2018.

intersectional approaches to architectural pedagogy, and the ways in which more diverse policies and teaching practices in schools of the built environment could be implemented to improve inclusivity and equality in the architectural profession' (Thomas, 2018). Attended by the student and faculty representatives of the five architecture schools of the BauHow5 Alliance, the workshop was divided into two instructive panels featuring scholars and practitioners from across the globe, such as Lori Brown and keynote speaker Harriet Harris, with the aim of exploring possible avenues for diversification at the structural and cultural level of the architectural academy.

In addition to the main workshop, an autonomous action group from the TU Delft Feminists led by Brigitte O'Regan and Tomi Hilsee organised an independent 'Rebel Workshop: Meeting for Students and PhDs', an informal student-to-student lunch workshop meeting that sought to provide 'a platform to each of the universities to share their stories and experiences on taking action for inclusion' (Rebel Workshop, 2018). More ideas guided the workshop, certifying the words already stated by Audre Lorde in 1984, 'the master's tools will never dismantle the master's house'.

Inspired by the workshops, some of the participants and other student and faculty activists came together to organise a collective action to enact change within the architecture department. Unsurprisingly, the corridor of portraits became the subject of the action and a counter exhibition took place after a long process: 'That Exhibition that Happened in the Corridor: Approaching Architectural Knowledge(s) Otherwise' (@exhibition_in_the_corridor). The counter exhibition, a collective work of many, was crafted in its last phase by María Novas, Alberto Altés Arlandis, Golnar Abbasi, Tomi Hilsee and Meryam Ajari. After a long collaborative research, development and design process, it was exhibited in the corridor at the Department of Architecture between April and June 2019 (Figure 4). It was also briefly displayed in the Study Centre at Het Nieuwe Instituut in Rotterdam in July 2019 (Figure 5). In parallel, another action took place in May that year: the mysterious appearance of the Blob chair in the faculty's permanent chair exhibition; a plastic pink inflatable chair in the shape of a penis, to draw attention to the predominantly masculine power of the collection (Figure 6). The Architecture Collection is significant; in 2022 it comprises 392 chairs, of which only 6 of those with attributions (102) are authored or co-authored by women. The

Figure 4. Counter exhibition in the corridor. Photo by María Novas-Ferradás, April 2019.

Figure 5. That Exhibition that Happened in the Corridor, announced at the HNI website. Source: Het Nieuwe Instituut, hetnieuweinstituut.nl.

majority of the cases are listed either as "unknown" or "anonymous"(Architecture collection, 2022).

These events were a fleeting landmark in the recent history of the architecture school, which gave rise to difficult and important conversations about the future of architectural education at TU Delft. The urgent changes demanded by student and researchers' collaborative initiatives are just some of the fruits of this process. Since then, some changes have taken place. In recent years, the Architecture Department has employed more women in higher positions than ever before in its history, bringing the total of female full professors to three (out of eight), and a substantial intake of female assistant professors on tenure track contracts. Yet, people of colour are

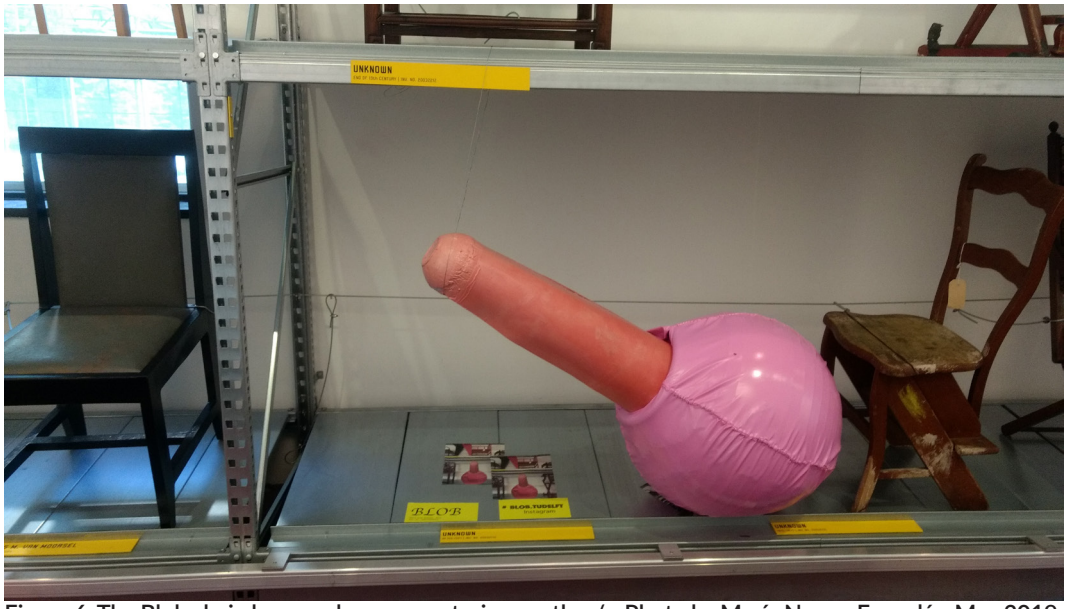


Figure 6. The Blob chair, by an unknown mysterious author/s. Photo by María Novas-Ferradás, May 2019.

a small minority, and no woman has ever directed the department, in contrast to the other departments within the faculty, which have all had at least one female head. The faculty itself has had just one female Dean, Karin Laglas (2011-2014). These numbers show an increase above the university, and national, average. As the Dutch Network of Women Professor's annual Monitor of 2021 showed, over the last twenty years the percentage of women Full Professors in Dutch universities has increased from 6.5% to around 20%, with some institutions like the Open University employing women for over 40% of full professorships. Yet out of the fourteen institutions surveyed, TU Delft was at the bottom, with only 17.9% of women as full professors, with 33.5% as assistant professors, and 22.5% as associate professors (LNVH, 2021; TU Delft , 2022).

In addition to these changes in employment, the faculty has endeavoured to make more cultural changes through the creation of the Diversity Office led by Roberto Rocco from 2021 and the organisation of the Department of Architecture Research Day on Equity, Diversity, Inclusivity, Architecture by Janina Gosseye in April 2022. While these changes indicate a step in the right direction, there is still much work to be done regarding the elimination of excluding cultural values that still define our architectural pedagogies. Which future directions should be taken to change our attitude towards architectural history education? How can we reframe sustainable structural shifts in our knowledge system in the context of the fourth wave?

For this epistemological and methodological challenge, we rely on radical pedagogies in architectural education, as expounded in the work of Daisy Froud and Harriet Harriss (2015). As Harriss notes, 'in ancient Greece a paid-agogus or pedagogue was a leader of the young. But for an aspiring "radical" pedagogue, educating involves more than leading, and learning involves more than being led. A radical peda-

gogy involves stepping away from orthodox practices and revisiting the real —and surreal— fundamentals of what and whom an education is for, and who delivers it' (Harriss, 2015, p.11). Perhaps more importantly, she claims that 'feminist pedagogies emphasize our interconnectedness: the need to share and redistribute and to work for collective good and not just individual goals' (Harris in Lange & Scott, 2017, p.92). And as acknowledged by bell hooks through her book Teaching to Transgress, 'The classroom remains the most radical space of possibility in the academy' (1994, p.12).

Following these theories, the two following sections present the results of the epistemological and methodological explorations developing and co-teaching two interconnected courses run between 2019-2021 at the TU Delft: the 'Delft Lectures on Architectural History & Theory' and 'Thesis in Architectural History'. Forming part of the first-year education for students of the Master of Science Architecture, Urbanism and Building Sciences, these interconnected courses comprised approximately 450 students with mostly an international background. In the lecture part of the course the students received knowledge, in the seminars, they produced it. The 'Delft Lectures' involved the dissemination of knowledge via eight lectures (given variously by Amy Thomas, Herman van Bergeijk, Carola Hein, and Marie-Therese van Thoor) and four reading seminars. The 'Thesis' course comprised around eight seminars led by different tutors with approximately twenty-two students each, with the purpose of helping students to develop an 8,000-word master's thesis in architectural history. Students were taught by the same tutors, in the same groups, for both the reading seminars and the thesis seminars. This academic year included one thesis seminar explicitly on the topic of architectural history and feminism.

3. WHEN STUDENTS GAIN KNOWLEDGE

Initiating a radical pedagogical shift within a pre-existing academic system is a challenge. Curating a master's level course for 450 students from all over the world, with varying educational backgrounds, is difficult, both conceptually and logistically, not to mention the invisible institutional resistance to an explicitly politicised course. As the main history content of the master's degree, the Delft Lectures in Architectural History and Theory had to balance breadth with depth; the eight lectures and accompanying readings had to offer a general historical 'survey'—already a problematic concept, based on the longstanding tradition of Anglo-European art schools in which an expert delivers the (Western) canon of architecture through a series of lectures—whilst also offering a higher-level argument or critique. Even if this has been challenged through the addition of more global perspectives in recent years, the context of TU Delft as a technical, and technocratic, institution, created another problem: despite the fact that history is positioned as the foundation of a good architectural

education (via canonical 'reference projects' in architectural studios), its courses receive very few hours in the overall master's programme due to the devaluation of history and the humanities in architectural education. In short, the course had to offer a survey but at the same time be critical; it had to be foundational in content, yet minor in terms of hours; and, for us as teachers, it had to be political in its aims so as to change the narrative, but general (read: benign) in appearance.

These contradictions are not meant purely anecdotally. They are just some of the institutional barriers or decelerators to making architectural education and architecture inclusive. Architecture and feminism, race, disability, and sexuality have historically been niche subjects, given space through radical electives and studios led by women, people of colour, differently abled, and LGBTQIA+ individuals. These topics have been taught on the margins by those in the margins. Only recently has this work begun to enter into mainstream teaching, and to permeate the architectural history curriculum, thanks in part to the spread of knowledge through edited volumes, conferences, and other publications.

Traditionally, the privileging of the Western canon, of superficial issues like 'style', and of the development of architectural modernism (a 'universal' technical and formal system), have side-lined these other discourses as electives and alternatives. Likewise, the lack of time given to teaching and studying these courses not only limits the content of survey courses, but it also limits the preparation time (a stranglehold that is all the more problematic with the neoliberalisation of architecture schools and the growing precariousness of academic work). The latter is fundamental to a course that challenges the hegemonic discourse of a Western, patriarchal canon; as teachers we have to 'unlearn', and then re-learn, our discipline through a more inclusive lens. We, too, are products of the system. But this process doesn't happen quickly. It requires us to read, re-read, and reassess old texts, as well as devouring the new.

Titled 'The Architect As…: Histories and Historiographies of Architectural Production' in the academic years 2019-2021, the Delft Lectures in Architectural History course attempted to balance these conflicts through the theme of the identity of the architect, exploring the idea that 'the transforming public identity of architects is not simply the outcome of changes in architectural practice, but also the product of changing thought paradigms in historical enquiry.' As expressed in the course handbook, the course outline, then, embedded (or perhaps concealed?) identity politics within the wider historical discourse of the architectural profession, looking at the way 'broad historical ideas such as progress, technological advancement, political propaganda, futures thinking, and the classification of knowledge (e.g., the distinction between intellectual and manual labour), have informed historical narratives of architectural practice'. In doing so, the aim was to show that the history of architecture was more than the interrelationship of buildings, architects, and their contexts, and instead 'dependent on the way these stories are told and framed, in other words,

on the historiography of architectural production' (Delft Lectures in Architectural History Handbook, 2019).

In this critical survey, 'the way these stories are told and framed' was in fact the focus, not the architect. Through looking at the way that patriarchy, colonialism, racism, and capitalism intersected with key ideas surrounding architectural knowledge, e.g., technology, professional institutions, modernism, and foreign travel, the course aimed to understand the ways that power has operated across class, race, and ethnicity in the architectural sphere historically. As Leslie Lokko writes, 'one of fourth wave feminism's major challenges to previous feminist discourses is its willingness to confront 'difference' in multiple ways' (Lokko, 2016). The aim was to articulate to students how the definition of 'the architect' we have today is largely produced by a Western historiography, in which discrimination and domination were hidden beneath terms like style, progress, heritage, standardisation, universalism, and mobility. Dividing the lectures thematically, the course was structured via the starting point, 'The Architect As…' with each week conceptually unpacking a different presupposed identity: 'Artist', 'Professional', 'Agent of Ideology', 'Dreamer', 'Preservationist', 'Ecologist', and in the second year, the addition of 'Migrant'. Each lecture then broke apart such terms, showing the historical genesis of these ideas, and the ways in which certain forms of knowledge were elevated, and others subjugated.

As teachers, we had some fundamental questions before us: How do continue challenging the canon in a foundational lecture course? Do you re-make (discard) the canon, bringing in less well-known examples, and thereby bringing new reference projects and names into the academy? Or do you break it, by using a critical line of argument to show the flaws in our previously held assumptions about such an elite selection?

In designing this course, 'unlearning' was only made possible through the help of many brilliant scholars and teachers who had done the hard work of both breaking and re-making the canon. Contacting friends and colleagues who kindly shared syllabuses (into which so much time and labour had been poured), and the acquisition of many open access syllabuses was essential to building up background knowledge to be able to retell this story. These included: Torsten Lange and Gabrielle Schad's in-depth series of seminars at ETH Zurich, taught between 2017-2019, 'On Gender', 'Care Work', and 'Body Building'; Huda Tayob and Suzanne Hall's ground-breaking open access syllabus on 'Race, space and architecture' for the London School of Economics and Political Science; the Global Architectural History Teaching Collaborative, an online platform of syllabuses and course content from a global perspective; the Space and Race reading list, produced by a group of architectural historians, art historians, architects, and urbanists in reaction to the August 2017 events in Charlottesville, and revisited in 2020 after the murder of George Floyd; and Carola Hein and Barbara Lane's courses on Modern Architecture at Bryn Mawr College.

Through the help of these syllabuses, it was possible to select readings and develop the lectures in a way that critiqued the dominant narrative, thus asking students to question and reframe the knowledge that most had received in their undergraduate education. For example, by positioning Le Corbusier's *When Cathedrals were White*, with Mabel Wilson's radical racialised critique, the central tenets of modernism were simultaneously explained and problematised. In other instances, central words like 'migration' were reframed through the lens of historical colonialism, with the work of authors like Jiat-Hwee Chang and Anthony D. King.

As well as unlearning, it became clear that collaboration is also essential. One key problem that re-emerged was the paradox of representation. How can one give voice to those that have historically been overlooked without enacting a further act of violence by speaking for them? Consequently, in the second iteration of the course, to enable a greater multiplicity of voices, informal conversations were recorded with experts in the specific topics, including, for example, Rachel Lee (co-editor with Anooradha Iyer Siddiqi of the innovative and brilliantly critical collections of *Feminist Architectural Histories of Migration: On Margins* (2020), *On Diffractions* (2021) and *On Collaborations* (2021)), and Adriene Brown on her text 'Erecting the Skyscraper, Erasing Race'. As an African-American scholar telling the story of American modernism from the 'other' side, Brown's situated perspective gave a new and important level of insight. We asked the students to bring their voices into the conversation, too, through the assignment of a group reflective writing task, asking them to reflect critically on the lectures and texts through their own situated perspective. This task, though challenging for the students at first, proved to be one of the most positively remarked upon aspects of the course in the student questionnaires, second only to the diversity and criticality of the content.

While it was, at times, extremely challenging to rethink and restructure a course of this scale, it was a tremendous learning experience. Curating a course that would be inclusive demanded self-reflection, the reassessment of the values that were instilled in our own education as architectural historians, and research into new and alternative ways of seeing. It seems that here the old adage that 'the true teacher is the learner' was indeed accurate.

4. WHEN STUDENTS PRODUCE KNOWLEDGE

In parallel to the Delft Lectures, the History Thesis course offers diverse seminars on different approaches in connection with the interests of each of the teachers. In the academic year 2020-21, the seminar led by María Novas Ferradás concerned the topic of architectural history and feminism. In these courses, students can choose their tutor and seminar after reading a short description of the aims of the seminar. With certain fear of leaping into the unknown, the group was finally described as follows:

> History of architecture and urban planning, with a focus on social and political history, gender theory, and cultural studies. Social values in architecture and urban design, especially those developed in connection with the feminist movement over the centuries. Unveiling the hidden history of women's (devalued/appropriated) work in the architectural world.

The group was fully subscribed, with a vast majority of female students (21/1). Then the work began. One of the major challenges when working with students during the first weeks (in the phase when they should define their topic of interest) was to empower them to become agents of social change; to recognise their ideas and themes as valid for writing a scientific document on architectural history. Unexpectedly, one of the biggest challenges was to understand how epistemic authority has been historically built and continues to influence valued and undervalued architectural research through history. Some students automatically assumed some topics would be 'better' or 'more scientific' than others to get a better grade. Based on the ideas of feminist philosopher Norma Blázquez Graf (2012), we identify some of the issues that were present in class:

1. Women's knowledge is considered subjective and confronted with the doctrine of objectivity, which is not less than what feminist thinker Remedios Zafra (in accordance with Adrienne Rich) establishes as the term that many men have given to their own subjectivity (Zafra, 2017, p.78). Currently, excluded, depreciated, minimised, subordinated, or invisibilised '(her)stories' (as opposed to the dominant 'his-stories') continue to inhabit the margins, and 'the work of recuperating these histories is ongoing and has yet to radically alter what and how history is taught' (Merrett in Lange & Scott, 2017, p.90)
2. Theories produced from women's experiences are presented as inferior or deviating from the norm (the androcentric paradigm, see Novas Ferradás, 2021)
3. Theories are produced from social phenomena which omit inequality in power relations and how they affect women's and historically oppressed groups' lives
4. Scientific knowledge is produced, reproduced, and legitimated from the top of the pyramid of power, reinforcing itself and contributing to consolidating inequality

Thus, even for somebody in a position of influence and academic authority, the fact of promoting feminist pedagogies could be a question of risk, as Harriet Harris explains:

> For a mistress pedagogue in a position of influence, explicitly promoting feminist pedagogies can often be discredited as 'subjective', 'personal' and 'politicizing' (i.e., actions

> considered 'un-academic '), fueling the fear that such 'activism' will worsen already poor chances of promotion and increase isolation. Yet feminist pedagogy emphasizes collective over individual action, to protect rather than expose its own. It demands that the false dichotomies that divide us are deconstructed – from student v tutor to end-user v architect – disrupting the debilitating and exhausted power relations that have served to perpetuate partitions based on gender identity, ethnicity, class, age, ability and sexuality (Harris in Lange & Scott, 2017: 92).

Feminist theory and literature produced by feminist academics in the English language helped to question these biases – mostly historical ones produced during the second and third wave of feminism. As Donna Haraway claimed in 1988, 'feminists don't need a doctrine of objectivity that promises transcendence, a theory that loses track of its mediations just where someone might be held responsible for something, and unlimited instrumental power. We don't want a theory of innocent powers to represent the world' (1988: 579).

The results of the seminar were analysed for the first time in the *I Spanish Congress Women and Architecture, Towards an Egalitarian Profession* (Unizar, October 2021). There, this experience in the Netherlands was examined together with the one developed by Lidewij Tummers in Germany (Novas Ferradás & Tummers, 2021). From these two complementary perspectives, this collaborative work acknowledged that gender biases were always present in education – explicitly or implicitly – which was confirmed not only through the selection of themes and contents but on the methodology employed; the research methods followed to gain and produce knowledge. In particular, at TU Delft, the experience had contributed:

> ...to document and disseminate the hidden history of women's work in the world of architecture (traditionally devalued and/or appropriated); not only figures made invisible or underestimated over time, but also artefacts (buildings, books, documents ...) that can constitute interesting case studies. During the process, the understanding of the barriers that future architects will still have to face in their professional careers – and that precisely have historical roots – is promoted, while their topics of interest are validated with a scientific basis, providing confidence and safety (Novas Ferradás & Tummers, 2021, translated from Spanish by the authors).

Also, once the ideas were set, in order to write a master's thesis with scientific character, students faced extra challenges. How could we document historical silences? During the research and writing period, the development of the course required some innovation in relation to classical research methods. Archival information was insufficient, if not non-existent. When setting references, we had to mostly look into literature produced by women or feminist scholars since they were the ones who have

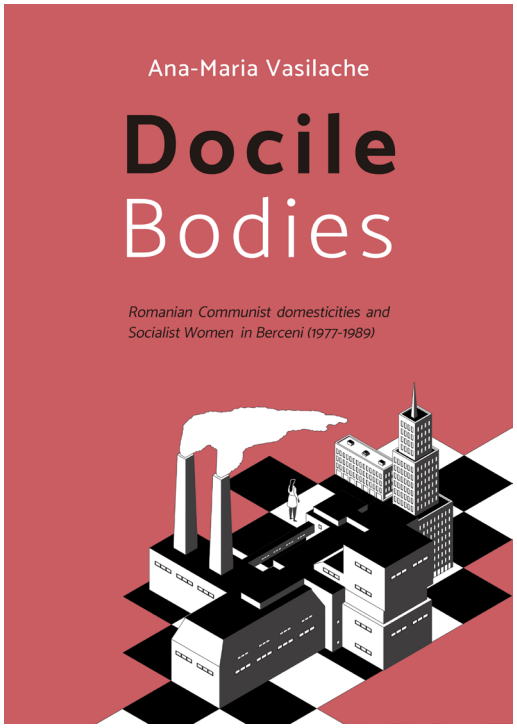


Figure 7. 'Docile Bodies: Romanian communist domesticities and socialist women in Berceni (1977-1989)', History Thesis by Ana Maria Vasilache, TU Delft, 2021.

mostly documented the work of other women in the field. Also, serendipitous interviews played a key role. Oral history was especially important in the form of semi-structured interviews with family members or researchers who knew the subject of study to document things that everyone knew but had never been put down on paper. Furthermore, other qualitative research methods, such as participant observation and image analysis, in the case of an object, artifact, or work of architecture, contributed to bringing the feminist analysis to life.

Despite the difficulties, some excellent and completely innovative master's theses based on primary sources emerged from this process – some already published (see Jackowska & Novas Ferradás, 2022). For example, student Ana Maria Vasilache wrote about 'Docile Bodies: Romanian communist domesticities and socialist women in Berceni (1977-1989)' through the analysis of the housing architecture and domestic standards of the neighbourhood of Bercini in Bucharest, Romania, built before the fall of the Berlin wall (Figure 7). Quirine van Thiel wrote historical research on *De Menselijke Maat* (1980-2005), a Dutch booklet for architectural students prepared by a professor at TU Delft that had two editions, one in 1980 and one in 2005. In this case, it was very interesting to see the similarities and differences in the representation of gender roles in both editions. Besides, in the process the author found that the person who had made its illustrations, and whose name was abbreviated to a simple initial, was a female engineer, Danielle Leever-van der Burgh (Figure 8). Student Oliwia Jackowska wrote on 'Women's Everyday Lives in the City: A groundbreaker exhibition on gender and urban planning in Vienna (1991)' (Figure 9). This exceptional work documents for the first time the exhibition that gave rise to the influential Women's Office led by Eva Kail in the Urban Planning Department of the City of Vienna in the early 1990s, that would develop dozens of social housing projects for more than twenty years. Finally, Lucie Castillo Ros wrote the master's thesis 'Memoires de cuisines: The kitchens of the French Reconstruction Era (1945-1970)', for which she interviewed her grandmother, and found, during the process, not only the history of her family but what most of the kitchens of the French work-

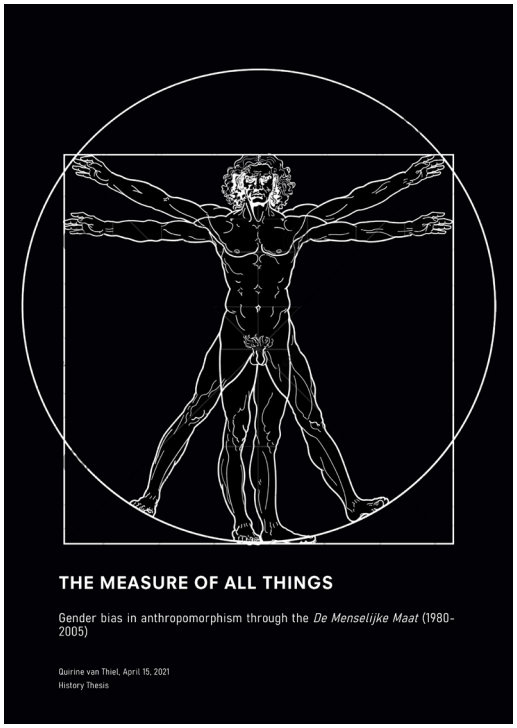


Figure 8. , 'The Measure of All Things: Gender bias in anthropomorphism through De Menselijke Maat (1980-2005)', History Thesis by Quirine van Thiel, TU Delft, 2021.

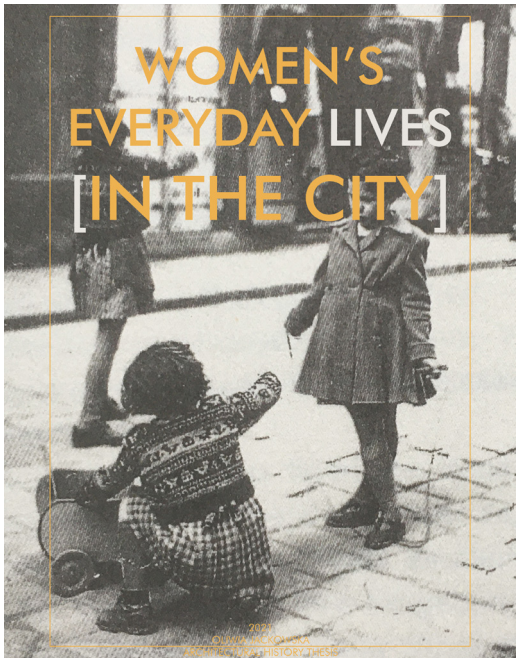
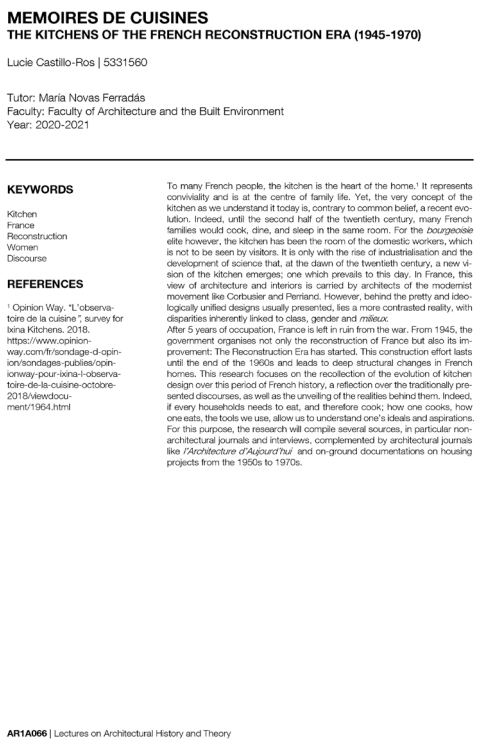


Figure 9. Oliwia Jackowska, 'Women's Everyday Lives in the City: A groundbreaker exhibition on gender and urban planning in Vienna (1991)', History Thesis, TU Delft, 2021.

ing class were like – which often had little to do with the bourgeois stereotypes and the precepts of modernity that the magazines illustrated (Figure 10).

Some of the final remarks, co-developed with Lidewij Tummers in the paper on feminist didactics for the *I Spanish Congress Women and Architecture: Towards an Egalitarian Profession* are still valid to refer to some reflections. Through this seminar the personal became visible. Students gained awareness of existing inequalities in the profession (salary discrimination, double standards in assigning tasks, the historical devaluation of the feminine workforce and its consequences in recognition and wage procedures, etc.). This awareness also helped students break with stereotypes and not only read and handle male references and role-models, while developing a sense of social and spatial justice. The challenges faced through the research process and questioning of first-hand available sources also contributed to fostering an inclusive classroom culture based on listening, talking, and sharing research experiences. And perhaps more importantly, the seminar contributed to the academic validation of (situated) knowledge; their ideas were considered relevant, human, and universal.



MEMOIRES DE CUISINES
THE KITCHENS OF THE FRENCH RECONSTRUCTION ERA (1945-1970)

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KEYWORDS

Kitchen
France
Reconstruction
Women
Discourse

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To many French people, the kitchen is the heart of the home.[1] It represents conviviality and is at the centre of family life. Yet, the very concept of the kitchen as we understand it today is, contrary to common belief, a recent evolution. Indeed, until the second half of the twentieth century, many French families would cook, dine, and sleep in the same room. For the *bourgeoisie* elite however, the kitchen has been the room of the domestic workers, which is not to be seen by visitors. It is only with the rise of industrialisation and the development of science that, at the dawn of the twentieth century, a new vision of the kitchen emerges; one which prevails to this day. In France, this view of architecture and interiors is carried by architects of the modernist movement like Corbusier and Perriand. However, behind the pretty and ideologically unified designs usually presented, lies a more contrasted reality, with disparities inherently linked to class, gender and *milieux*.
After 5 years of occupation, France is left in ruin from the war. From 1945, the government organises not only the reconstruction of France but also its improvement: The Reconstruction Era has started. This construction effort lasts until the end of the 1960s and leads to deep structural changes in French homes. This research focuses on the recollection of the evolution of kitchen design over this period of French history, a reflection over the traditionally presented discourses, as well as the unveiling of the realities behind them. Indeed, if every households needs to eat, and therefore cook; how one cooks, how one eats, the tools we use, allow us to understand one's ideals and aspirations. For this purpose, the research will compile several sources, in particular non-architectural journals and interviews, complemented by architectural journals like *l'Architecture d'Aujourd'hui* and on-ground documentations on housing projects from the 1950s to 1970s.

AR1A066 | Lectures on Architectural History and Theory

Figure 10. 'Memoires de cuisines: The kitchens of the French Reconstruction Era (1945-1970)', History Thesis by Lucie Castillo Ros, TU Delft, 2021.

5. FINAL REMARKS

It is never easy to evaluate how 'successful' a large course like this has been. From the students' perspective, we have only the results of the student questionnaire (answered by around 25% of the attendees) to base our conclusions on, and though these were largely very positive they too can be problematic in terms of gender bias and the influence of external factors. Yet it was clear that the overall student satisfaction was high, with a notable number of comments about the challenging, critical content that was more diverse than in their bachelor's education. Feedback from tutors teaching at the seminar/thesis part of the course were equally positive about the new content, with a notable increase in the number of tutors offering thesis courses on topics like gender in the second year than the first. From our perspective, there is certainly still much work to be done. The addition of more diverse geographical contexts and diverse lived experiences of women in the Global South, the introduction of critical race theory, and disability theory are a necessity if the course is to become truly inclusive and diverse in its content. Despite two years of work and research, we still have large knowledge gaps that only serve to reinforce the central biases at the core of an architectural history education.

While organising and teaching these interlinked courses was a hugely enriching and informative process, it was also challenging, both professionally and personally. For one, it induced fear and vulnerability about possible hostile reactions. Yet, as stated by bell hooks 'If we fear mistakes, doing things wrongly, constantly evaluating ourselves, we will never make the academy a culturally diverse place' (1994: 33). Such work thus requires acknowledgment of the difficulties, as well as the methodological and epistemological evolution in the process. This was not easy to do, and indeed, it did not happen accidentally. It also needs awareness and support. In this case, the students' claims as well as the support of the full professor who oversaw the course at higher academic levels were key in the process, not to mention the

Figure 11. From left to right, Ludwig Mies van der Rohe, João Filgueiras Lima, and Huig Maaskant portraits in the permanent exhibition in the corridor of the Department of Architecture in 2018. Photo by María Novas-Ferradás, 2018.

Figure 12. Feminist architect Jane Drew portrait, with Enric Miralles (left) and Charlotte Perriand (right), in the permanent exhibition in the corridor of the Department of Architecture in 2019. Photo by María Novas-Ferradás, May 2022.

progressive rise of awareness at the wider department level (Figures 11 and 12). More importantly, the design and teaching of such a course needs trust and generosity to validate the epistemic authority of those that have been historically in the margins and that never had the opportunity to become part of the academic world.

On the other hand, this learning experience is far from finished. Curriculums and academic disciplines exist by virtue of selection. To define what architectural history is about, it is necessary to define what it is not. This poses uncertainty when taking the risks and responsibilities of making decisions; it requires 'staying with the trouble' (Haraway 2016). These 'new conditions of uncertainty' that the resurgence of feminist thinking in this fourth wave is raising, prevent us from setting up conclusions that traditional academia would require. History will have the last word. As stated by Nancy Fraser:

> But even given this lack of agreement, despite the uncertainty and abnormality, the struggle against injustice will go on, and indeed must go on; we cannot sit back and wait for a new grammar to resolve these problems. My idea is that we have to be able to do both things at once; we should be capable of keeping up the struggle against injustice through the specific ways we choose to deal with these new conditions of uncertainty. (Fraser in Palacio Avendaño, 2009)

In this always unfinished process, we might evolve a new language where feminist epistemology, new methodologies, and situated knowledge are taken into account.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

VALUES-BASED REDESIGN IN GAMIFIED LEARNING ENVIRONMENTS

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ABSTRACT

Architectural redesign risks damaging or destroying built heritage, especially when designers are unaware of its cultural significance. This needs to be prevented, as built heritage is a human right, as coined by the 2005 Faro Convention. As a result, architects are now encouraged to conduct values-based redesigns with a broader range of stakeholders in order to uncover the cultural relevance of built heritage and co-create their redesigns. This shift in perspective, from one that was formerly expert-based and individualistic, aims to better preserve built heritage and its cultural relevance. Students, the architects of tomorrow, must acquire the knowledge, skills, and attitude to master this shift in perspective. This chapter reports on the lessons learned when teaching values-based redesign in gamified learning environments (GLEs) in two courses offered to architecture students by the Heritage and Architecture Section of the TUDelft, in the Netherlands. GLEs were chosen because of their known efficacy in enhancing stakeholder involvement and contributing to decision-making processes in other contexts. Results revealed that even if students are more aware of heritage value, their redesign decisions are more often guided by their personal values, rather than collective values (i.e. cultural significance). Values-based design and co-creation are not relevant for the redesign of built heritage only. The lessons learned in this research can help develop learning objectives across bachelor and master programs so that students learn to engage with different stakeholders in different contexts. Elsewhere, this new approach is being applied in practice, often without training. In this situation, training new architects on the use of GLEs as engagement tools contributes to their professional development, fostering a culture of greater participation and co-creation in urban planning, architecture and built heritage.

GAMIFIED LEARNING ENVIRONMENT (GLE), GEOGAMES, VALUES-BASED REDESIGN, HERITAGE VALUES AND ATTRIBUTES, HUMAN RIGHTS.

PROLOGUE

'The game is a typical case of behaviours neglected by the traditional school, given the fact that they seem devoid of functional meaning. For current pedagogy, it is just a rest or a drain on a surplus of energy. But this simplistic view does not even explain the importance that children attach to their games, much less the constant way in which children's games are taken, symbolism or fiction, for example (...) the child who plays develops his perceptions, his intelligence, their tendencies to experimentation, their social instincts' (Piaget, 1985, p. 158).

1. INTRODUCTION

Higher education students and stakeholders involved in design are positioned as active and emancipated spectators (Rancière, 2007). From passive observers, stakeholders need to assume the roles of students and researchers, who observe phenomena and look for their causes (Lefebvre, 1991). Interpreting the world is already a way of transforming or reconfiguring it. This notion of the active spectator is aligned with the growing interest in international conventions and recommendations in the heritage field for citizen participation (Council of Europe, 2005; UNESCO, 2011). Unfortunately, who should be involved (social groups), how (methods) and by what means (tools) is yet to be further investigated.

Gamified (or Gamification of) Learning Environments (GLEs) have been broadly recognised as part of technological innovations that educational institutions are to adopt (Alexander et al., 2019; European Commission, 2020; Northern Dimension Partnership on Culture (NDPC), 2021) (ref, date; ref, date; ref, date). GLEs provide flexible and user-friendly learning methods to meet educational needs and the current challenges of the digital era. The gaming industry grew exponentially, as did the development of scholarship on teaching with games and the awareness that students today are immersed in computer games. However, such a trend has faced challenges sustaining its development (Alexander et al., 2019). Falling IT budgets, the difficulty of creating games that work for a large audience in academia, and the fact that some academics consider games better suited to primary schools are among the most referenced challenges.

Still, the application of serious games has been expanding, and they have already been used to address urban redevelopment in relation to heritage conservation, such as building degradation, densification and climate change (Anderson et al., 2010; Bampatzia et al., 2016; Mortara et al., 2014). Such games concern real-time computer graphics, virtual worlds, augmented and mixed reality, and artificial intel-

ligence to document built heritage. However, there is still a gap in research for tools to support heritage planning, e.g. interaction and collaboration, user-friendly visualisation, real-time response, indoor-outdoor connection, and, in the societal aspect, redesign, learning and awareness raising about values and attributes.

There is a wealth of digital entertainment-oriented games to support urban planning and management, such as SimCity (launched in 1989), PlastiCity (tested between 2004 and 2006), Urban Plans, City Creator (launched in 2002), and Super City (released in 2011) (Poplin, 2011). The first serious games aimed at urban themes were elaborated on and described by (Abt, 1987). Abt also developed serious games such as 'Corridor', 'Politica', and 'Simpolis' to explore transportation infrastructure, pre-revolutionary crisis, and decision-making facing an urban crisis, respectively. He defined games as '[...] a context with rules among adversaries trying to win objectives' and serious games as '[...] an explicit and carefully though-out educational purpose, [...] not intended to be played primarily for amusement.' However, 'this does not mean that serious games are not, or should not be, entertaining' (Abt, 1987, p. 6).

Serious games matched the need in urban planning to seek alternative methods and tools to deal with the complexity of citizen participation (Gordon et al., 2011). In traditional processes, prompted by a verbal description or even a set of images, spatial and urban concepts can be unknown to the lay public and can lower their interest and participation. Therefore, schools have created most digital serious games for urban planning with a focus on education, such as 'Londoner', 'SCAPE', and 'Urban Science' (Poplin, 2014). In particular, such 'games for change' should be able to represent, incorporate and express values (Flanagan & Nissenbaum, 2014), whist researchers can reflect on 1) how games can communicate values; 2) how to analyse the values that a specific game express.

Public participation is growing in urban planning, architecture and cultural heritage (Council of Europe, 2005; UNESCO, 2011). The future generation of architects, now students, is to gain knowledge, skills and attitude to successfully reveal the cultural significance and co-create the redesign of built heritage. Architectural redesign risks destroying built heritage, especially when designers and stakeholders are unaware of the cultural significance of the built environment. While design means adding new structures, redesign means adapting existing structures (Kuipers & De Jonge, 2017). Values-based redesign concerns a redesign where decisions are informed by the cultural significance (values and attributes) of built heritage. Cultural significance can be depicted conceptually in values (*what* is significant) and attributes (*why* it is significant). This is to ensure that the redesign decisions to add, keep and remove tangible and intangible attributes from a building capitalise on, and where needed, restore and enhance the existing cultural significance rather than destroying it.

Given the general lack of statements of significance detailing the cultural significance (values and attributes) of built heritage, and when existent, given their partial and

temporal nature, architecture students are challenged to identify cultural significance (values and attributes) as a baseline for their redesign (Clarke et al., 2020). Hence, this chapter explores two tools to support values-based redesign (Meurs, 2016; Pereira Roders, 2007) in an architectural and urban redesign approach in higher education. In the educational activities discussed in this chapter, the theoretical framework of values includes eight primary values: social, economic, political, historic, aesthetical, scientific, age and ecological values; and varied secondary values (Tarrafa & Pereira Roders, 2012). The theoretical framework of attributes includes both tangible (landscape, area, asset) and intangible (process, societal, relation) attributes (Veldpaus, 2015). The methodology and results sections further explain these frameworks and how they were integrated into the redesign.

1.1. GAMIFIED (OR GAMIFICATION OF) LEARNING ENVIRONMENTS (GLE)

When addressing urban issues, serious games are now known as geo games (Ahlqvist and Schlieder, 2018; Poplin et al., 2017). Such geo-location games for public engagement are based on collaborative planning (Innes and Booher, 1999) and playful public participation (Poplin, 2012). Recent geogames designed in higher education differ in concept and representation of space, approach to civic engagement, users, implementation, and the gradient of seriousness and fun (Poplin et al., 2017). For example, 'River Bend' focused on solving urban problems, with a realistic map to create a revitalisation plan for the city and collect players' opinions and perceptions. 'Fun Trippers' and 'Eggroll' focused on the learning functions of acquiring knowledge and new skills. 'Vacant Spaces' proposed interactions and tensions between players with bonus cards and some level of learning about urban planning decisions related to land use change. Figure 1 illustrates the evolution of the concepts: games - serious games - geogames, according to Poplin (2011, 2012, 2014 and 2018).

When geogames are used to support learning, they can be considered a Gamified (or Gamification of) Learning Environment (GLE). GLEs are pedagogical tools (Gee, 2003) which support the rhetoric of humanistic design (Deterding, 2019), aligned with positive psychology, design, and virtue ethics, which understand humans as inherently social, emotional, growth-oriented, meaning-making beings (Deterding, 2014). In GLEs, the learner is immersed in a virtual environment and has to undertake a learning journey and achieve specific targets. These targets are the learning goals (LOs) of the course. They can be more or less explicit. In addition, geogame mechanics such as the rewards (performance points, level badges, constructive feedback, and outdoor exploration) can help enrich the learning experience, embedding aspects of fun, challenge, autonomy and social network.

An excellent example of a GLE is the block-building game Minecraft. Released in 2011 by Mojang, it is the most-played and best-selling game in the world, with over 238 million copies sold in 2021 and a cultural phenomenon due to being a plat-

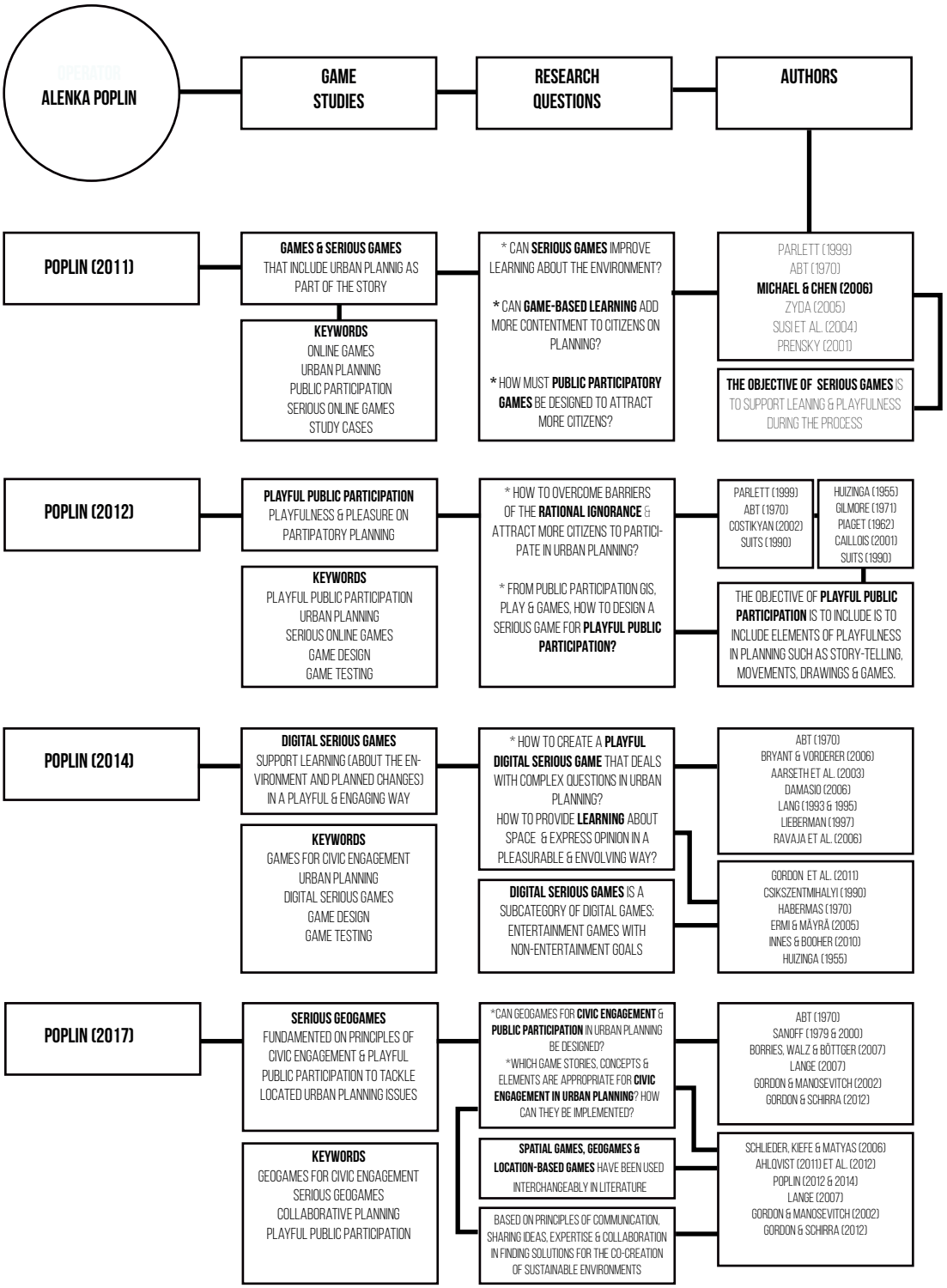


Figure 1: Diagram showing the evolution of the concept the concept of games to serious games to geogames. Diagram by authors, based on Poplin (2011; 2012; 2014; 2018).

form for creativity, education, and inclusivity (de Andrade et al., 2020). In Minecraft, the players use resources available in a fictional or real context to convert them into building materials. From 2013 onwards, the game was used to address urban issues, such as the 'Block by block' initiative (Delaney, 2022), a partnership between Mojang, Microsoft and UN-Habitat. For example, in Nairobi, young residents redesigned a public space together with the help of Minecraft. It can also been used to create a GLE such as exploring a university campus, and creating virtual teaching classrooms using Virtual Reality (VR) (Rospigliosi, 2022). Moreover, the Geocraft project (Scholten et al., 2017), proposed a methodology to engage young people to detail their own streets and houses to reconstruct virtually the whole Netherlands.

Another example of GLE, is Pokémon GO, an augmented reality (AR) mobile game launched in 2016 by Niantic, which uses GPS to locate, capture, train and battle virtual creatures called Pokémon. The game attracted over 65 million users worldwide within one week of its launch and is especially popular among young people (Ekonomou & Vosinakis, 2018). It allows players, as Pokémon trainers, to explore real locations differently, suitable to experience historic cities, since its mechanics help an immersion into their cultural content. The game has been adapted and curated by researchers and the Pokémon GO company to attract people to get to know the built heritage of their city, such as the 'Lure Party – Pokémon Go' organised by the municipality of Braga in Portugal, and 'Pokémon GO at Big Heritage Festival', organised by Big Heritage, a UK heritage organisation, in Chester, the UK (Atari, 2018).

This chapter reports on the lessons learned when teaching values-based redesign in gamified learning environments (GLEs) in two courses offered to Architecture students, by the Heritage and Architecture section, in TUDelft, the Netherlands. The GLEs used were, respectively, Minecraft and Pokémon GO. They were used to support learning activities of fieldwork, 3D reconstruction, design and decision-making. In addition, both geogames supported students in gaining knowledge, skills and attitude to master a change in approach, formerly expert-based and individualist. The new approach involves a broader range of stakeholders to reveal the cultural significance of built heritage and co-create their redesign.

The GLE set-up addressed three inter-connected challenges: a) hybrid education due to Covid-19, b) students learning and engagement (Kapp, 2013; Nacke and Deterding, 2017) about the values-based redesign, and c) the right of the public to built heritage. Between 2020 and 2022, a pandemic made higher education institutions implement hybrid education to keep functioning and tackle students' learning curve and lack of motivation. Also, such restriction brought up an issue of accessibility (and right) to built heritage and stakeholders' participation in built heritage redesign and decision-making.

2. TEACHING METHODOLOGY

Two courses were adapted to apply GLEs in support of a values-based redesign (see table 1) in the Architecture track, offered by the Heritage and Architecture section, TUDelft, the Netherlands, in two editions each, 2020 and 2021. Two geogames were implemented - Pokémon GO and Minecraft – for the GLE setting in order to analyse the cultural significance of a building and its urban context as well as to redesign with the outcomes.

Below, the methodology of the two chosen games as learning activities - Pokémon GO and Minecraft - are explained to explore the potential of the notions of values and attributes, defining the cultural significance of built heritage (Pereira Roders, 2007). These explore the concept of heritage more broadly, aiming to better capture their diversity and evolution over time and place. The case study is the city of Delft, South Netherlands, chosen due to being where TUDelft is located, accessible during the Covid-19 pandemic, for students to self-organise and explore it, with minimum risk, in a blended learning environment.

Students at the master level were asked to combine the outcomes of personal observation and perception with the outcomes of a systematic analysis of the (available) statements of significance, decoding in both the cultural significance on values and attributes of built heritage. They used the in-game textual descriptions of the tangible attributes in the built environment (e.g., short description of a church representing a Pokémon Stadium) to identify and code values.

COURSE	LEARNIBG GOAL (LO)	GAME
Bachelor's: Minor in Heritage and Design. Modules: BK7555 City and Transformation	LO1: Experiment cultural significance methods and tools concerning the appreciation, analysis and redesign of built heritage.	LO1: Pokémon GO LO1: Minecraft
Master's: Heritage and Architecture Lab. AR3AH115 Graduation Studio Revitalising Heritage. (55 credits)	LO1: Produce a cultural significance report based on the analysis of the values and attributes of a historic building. LO2: Produce an architectural project based on the cultural significance (values and attributes) of a historic building.	LO1: Pokémon GO LO2: Minecraft

Table 1: Learning goals and activities of the two courses, offered to Architecture students by the Heritage and Architecture section, TU Delft, the Netherlands.

2.1. POKÉMON GO

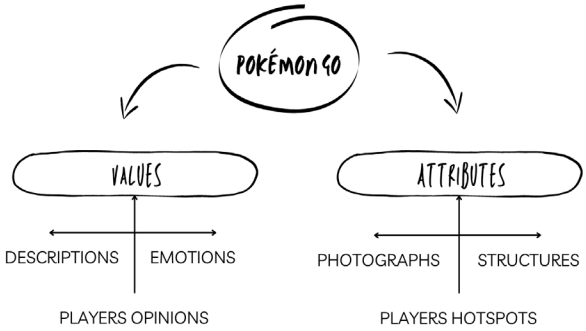


Figure 2. Cultural significance identification in Pokémon GO. Diagram by authors.

Pokémon GO was used to research the cultural significance of the historic city of Delft (Figure 2). The geogame visualisation shows the city augmented with digital structures such as Pokémon creatures, Pokéstops and Pokégyms. These last two are usually hosted in the real world by historic buildings and urban structures (bridges, courtyards, fountains, statues, and street art). Moreover, they usually show a photograph and a description of such tangible attributes. Therefore, Pokémon GO was used mainly to identify tangible attributes and, when available, values from the textual descriptions of these attributes.

There is an increase in complexity in this exercise, in which for the Bachelor level, students focused in their own opinions about the cultural significance of Delft. They undertook the technique of the *derive* (Debord, 1958) to explore and drift in the city. They were also asked to use a list of emotions (Plutchik, 1984) (eight primary emotions: anger, anticipation, joy, trust, fear, surprise, sadness and disgust), to help them produce the cultural mapping and to overlap positive and negative emotions with values (Figure 3). For the master's level, students needed also to identify and code values and attributes based on in-game text descriptions, using the categories of Pereira Roders (2007) and Veldpaus (2015).

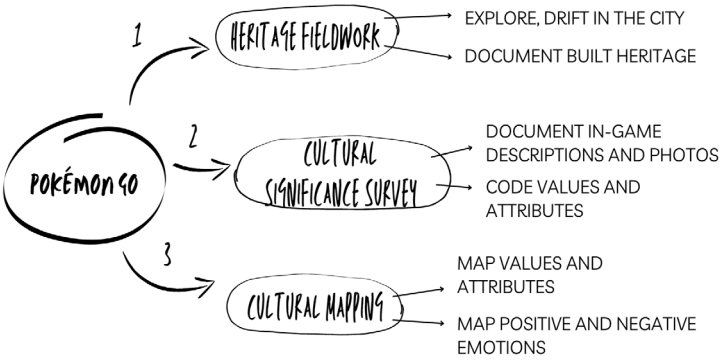


Figure 3: Pokémon GO implementation process. Diagram by authors.

2.2. MINECRAFT

The 3D block-building geogame Minecraft has been used for (re)designing buildings, cities and landscapes (de Andrade & Loddo, 2021; McNally & de Andrade, 2022; Poplin et al., 2020). Still there is a gap in research and education related to the accuracy and precision of the model, participation of older age groups, and its capacity to convey intangible attributes and values. It is a popular game that has a huge online community of players creating and adapting worlds, fostering autonomy, three-dimensional and spatial awareness, creativity and social interactions.

Minecraft was used as a tool to research the cultural significance of the Orsanmichele church and museum in Florence, Italy, and the Prinsenhof museum, Cable Factory, and Yellow Chemistry building complexes, in Delft, the Netherlands (Figure 4). The geogame visualisation shows the buildings with blocky and pixelated graphics, which can be removed/destroyed or added. Therefore, Minecraft was used mainly to explore the 3D reconstruction and decision-making aspects of the values-based redesign exercise focusing mainly on tangible attributes (asset: built element, building, urban element, natural element).

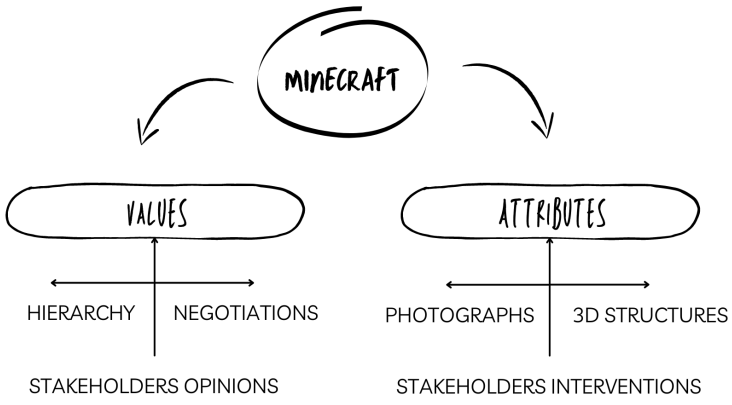


Figure 4. Cultural significance identification in Pokémon GO. Diagram by authors.

For the Bachelor level, 38 students, grouped mostly in five people, joined an online Minecraft co-creation workshop for 2:45 hours. They used a simplified version of the categories of values (ecological, social and economic) and attributes (skin/exterior and surroundings) to engage with their peers on a role-playing mode. In another exercise, three master students engaged with a group of real stakeholders in their own Minecraft workshops (4 hrs average) for their specific cases. This was accompanied with a values and attributes survey, where participants were asked to make a hierarchy of values (high, average, low) about specific attributes identified in archival research, projects reports, and expert interviews about ongoing redesign projects

related to their case studies. Such hierarchy aimed to keep track over decisions about what to keep, to adapt and to remove in the redesign. Students used participant observation methods for data collection (Kawulich, 2005) to position themselves as facilitators, helping stakeholders in the decision-making and negotiation process to reach one final values-based redesign representing consensus amongst the group involved (Figure 5).

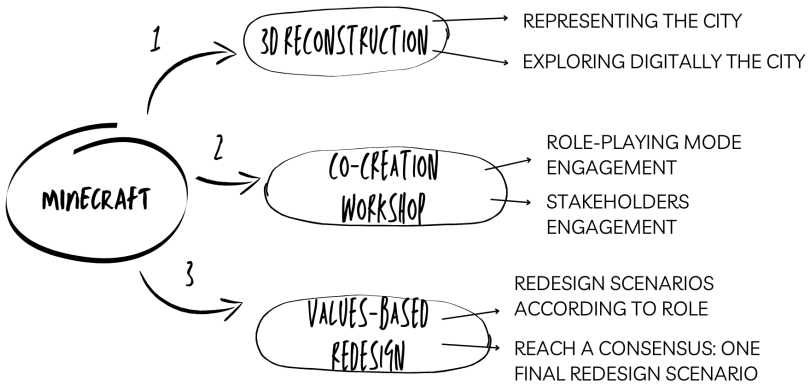


Figure 5. Minecraft implementation process. Diagram by authors.

3. RESULTS

3.1 POKÉMON GO

Pokémon GO provoked effectively provoked students to explore and analyse the city in a playful way, rather than the usual pin-point map-oriented or historic-led routing. It also contributed to kicking off the courses and raising the motivation and interest in the topic. Though it was their first contact with concepts such as cultural significance, students were able to identify and apply them reasonably. Bachelor students coded their opinions on values and attributes while combining positive and negative emotions. Master students took one step further and coded values and attributes present in-game. However, the lack of information on description texts, or imprecise ones, as well as the photos available, some outdated or misleading, limited the experience of better understanding what the community of players values.

BACHELOR LEVEL

In 2020, as part of the Minor in Heritage and Design course at the Bachelor level, a group of 3 students self-organised fieldwork to the city of Delft, in the Netherlands, to playtest, document, and evaluate Pokémon GO (Haahr, 2017). Students mapped

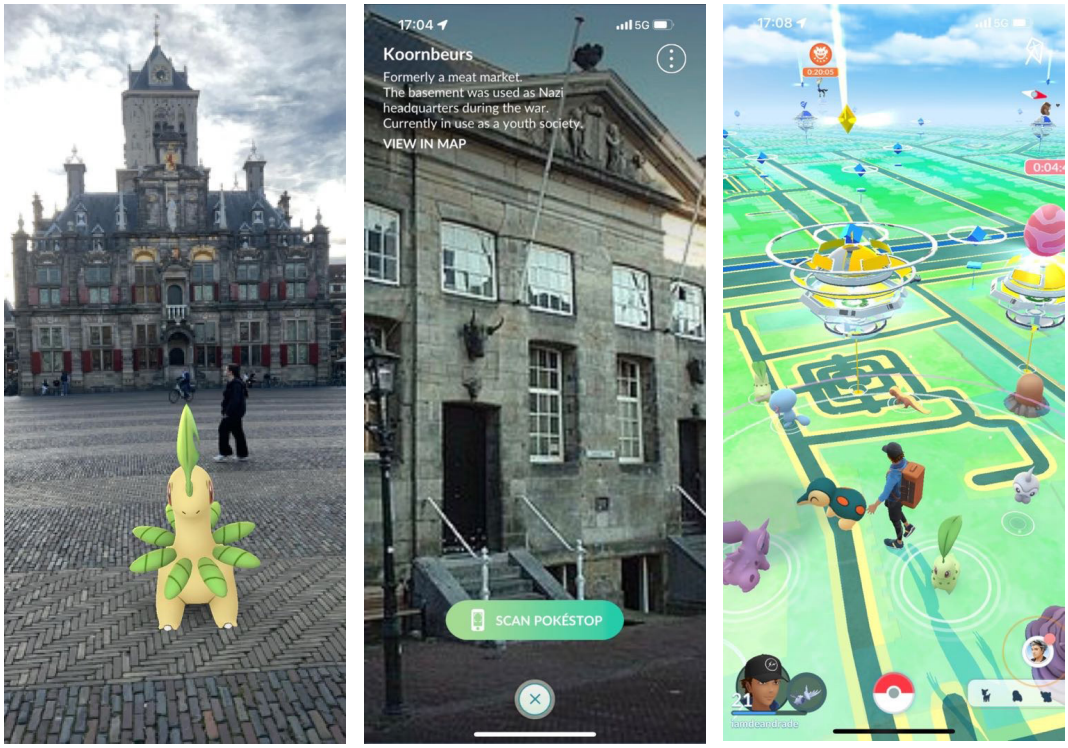


Figure 6: Pokémon GO images: left) catching a Pokémon in front of the City Hall; center) De Centrale building, former meat market; right) Prinsenhof urban block and related gaming elements. Screenshots by authors.

their values with positive and negative emotions. According to their final report, they found the geogame to be educational because it showed historic facts and locations in the city (Figure 6). Some of the findings reveal two bridges close by, one has an important crossover function, whilst the other, Ursulabrug, was kept after the demolition of a monastery in the 16th century, and it leads to nowhere, connecting two buildings with no relation to each other. Another finding revealed that underground the current restaurant 'De Centrale', formerly a meat market in the 17th century, was an undercover Nazi basis during World War II.

The road infrastructure is shown by the width of the roads. The map is limited to a flat two-dimensional surface, which means that by not visualising bridges, slopes, and crossroads, players can be misled. Students produced a cultural mapping of their routing in the city (Figure 7) highlighting in green and red lines the positive and negative emotions, respectively, which they related to their personal values. Buildings and places hosting Pokéstops and Pokégyms were marked with various icons resembling tangible attributes (e.g., old church, new church, Prinsenhof museum, city hall). Students identified tangible attributes with aesthetical values (artistic), political and social values (symbolic), and age and historic values (architectural).

For example, students conveyed historic and political values to the Prinsenhof museum, due to its rich history which impacted Delft and the Netherlands, i.e.

Figure 7: Cultural mapping produced by students (Fabian Schwegman, Florian Holtbernd, and Rens van Poppel) with a focus on values and emotions. Printed with permission.

being the house of Willem the Silent, leader of the Dutch Revolt against the Spanish Habsburgs that resulted in the formal independence of the United Provinces in 1648, and the place where he was killed. The building conveyed social values due to its different uses over time (e.g., convent, school, military). For them, its current function of a museum conveys aesthetical values. Regarding negative emotions and values, students warned against a dangerous area near the Sint-Sebastiaansbrug, south of city, where a Pokégym is located. The exact location is a small sculpture of Sint-Sebastiaan at a crosswalk of a busy road.

In 2021, another group made a fieldwork in the southern part of Delft, near the university campus. Students mentioned negative emotions and values due to bad smells such as horse excrement (which indicated they left the inner city), unpleasant smokes from the industries, and from scooters and cars. They also mentioned positive ones related to fragrant smell of freshly cut grass, lavender and of thyme. They identified different state of conservation of roads in front of the Science Centre (good), Royal Delft museum (bumpy and narrow) and Hortus Oculus garden (gravel). The most present soundscape was of bikes and their squeaking wheels and ringing bells, and of the wind. They conveyed the following values in the Science Centre (aesthetical, economic, historic, and age), Royal Delft (age, historic, social), and Hortus Oculus (aesthetical, ecological).

MASTER LEVEL

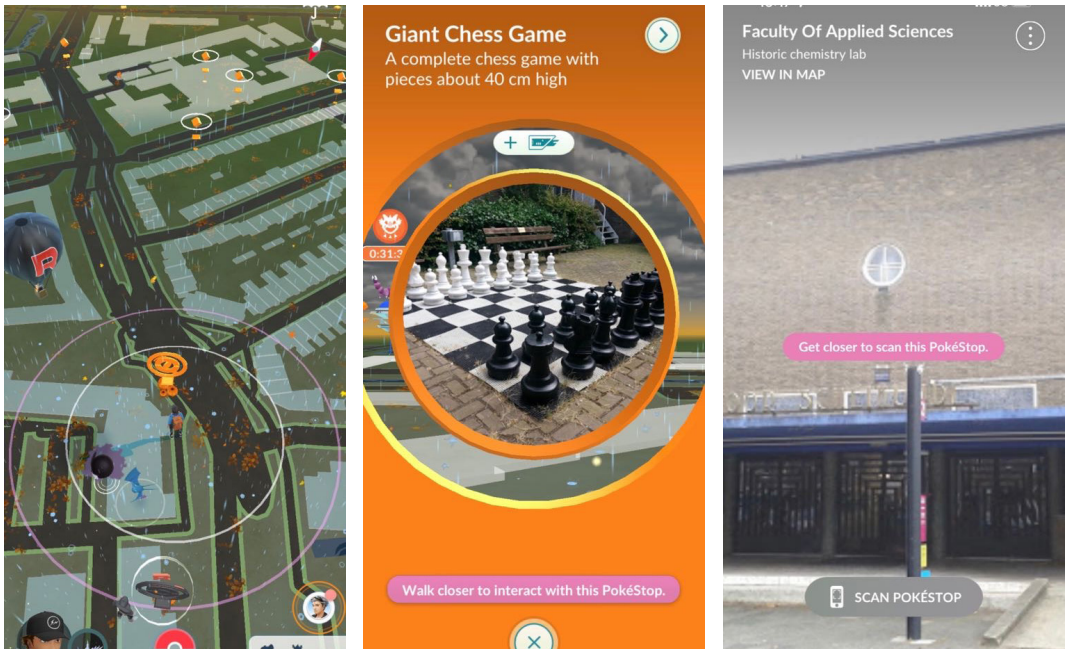


Figure 8: Pokémon GO images: left) Yellow Chemistry complex on the top right side; centre) the giant chess game; right) historic chemistry lab. Screenshots by authors.

Pokémon GO was used as a tool for fieldwork and context analysis. Three master students chose one building complex, Gele Scheikunde (Yellow Chemistry) and Kabelfabriek (Cable Factory) in Delft. In Gele Scheikunde, there were five Pokéstops; two entrances 'Kramers Laboratorium' and 'Faculty of Applied Sciences', which she conveyed historic and aesthetic values due to being an exemplar of a modernist educational campus; one garden with a 'Giant Chess Game', a former popular place for students and neighbours, conveyed social and economic value; two indoor functions 'Tiny Library', which used to promote book exchanges, conveyed social, emotional value.; lastly, a 'Knooppunt 28', formerly a point of a walking network, conveyed use and entertainment sub-categories of economic value (Ugnat, 2021) (Figure 8).

Concerning the Cable Factory, a former industrial building, a Pokéstop showed the façade of the building, the in-game map showed the main entrance to the building, a courtyard, and, next to it, another Pokéstop 'Hidden Artwork', conveyed historic and aesthetical values (Tol, 2021). The use of Pokémon GO in the fieldwork was defined as 'getting lost consciously', as well as safe and friendly due to in-game messages 'Remember to be alert at all times. Stay aware of your surroundings', and 'Be courteous to members of real-world communities as you play'. Tangible attributes such as materials, textures, and colours conveyed historic value, whilst the factory function itself or the new companies working inside it temporarily as with economic value (Figure 9).

ADVANTAGES	DISADVANTAGES
COGNITIVE DEVELOPMENT - Sparks location awareness, contact with nature and historic buildings, and social interaction. - Offers a hybrid space (real and digital), and countless Pokéstops and Pokégyms which are anchored in tangible attributes in the city. - Relatively simple controls (for mobile phones). **ACCESSIBILITY** - It can be played by all ages, though younger people were mostly seen playing it. - It is free, though it has in-game purchase options. - Players can interact with each other in the game e.g., battles and exchange items. **EXPLORATION** - Human perspective in the game. - Navigating through the city is a good way of interacting with built and natural heritage. - Includes an option to explore the city in Augmented Reality (AR). **REPRESENTATION** - The AR representation enriches the reality with Pokémons and other gaming elements, and makes it more fun to explore the environment. - The 2D map conventional representation allows players to better understand the area and get encouraged to explore it, e.g., finding 'hidden' public courtyards. **VALUES-BASED DESIGN** - Values conveyed to the fabric of built heritage by the community of players were partially identified by students, supported by prior knowledge. - Tangible attributes were identified and documented, and consequently also addressed in the cultural mapping. - Identification of most known values was successful e.g., historic and aesthetic.	**COGNITIVE DEVELOPMENT** - The wide range of gaming elements can be overwhelming, and distract students from their assignments. **ACCESSIBILITY** - Older generations are less likely to play the game, they were not seen by students playing it. **EXPLORATION** - Some students felt oblivious and at risk in a few routing if not aware of the environment. **REPRESENTATION** - Photos and texts are suggested by the most experienced players and approved by the managers. It is a bottom-up documentation provided by the community of players. Consequently, photos, and texts differed in accuracy, size and focus. - Some areas in the southern part of the city of Delft had less or no gaming elements. - The road infrastructure can be confusing when there is an overlap of streets at different height levels. The game also does not show topographic differences. **VALUES-BASED DESIGN** - Values that were not conveyed to the fabric of built heritage, or unknown were neglected. - Some relevant tangible attributes were not included in the game, and consequently also not addressed in their cultural mapping. - Intangible attributes were not identified in the game. - Identification of values and attributes failed when would not match the personal values.

Table 2: Advantages and Disadvantages of Pokémon GO.

Figure 9: Cultural mapping with Pokémon GO (Ugnat, 2021). Printed with permission.

On page 306. follows a set of advantages and disadvantages collected by the students and tutors while facilitating and observing participants during the workshops. The notes were grouped, categorised, and analysed accordingly (Table 2).

3.1 MINECRAFT BACHELOR LEVEL

Overall students (50%) rated the Minecraft workshop experience as a 4 out of 5. The level of engagement to fill out the evaluation survey via google form was average (26 out of 38 students). The Game design was assessed as 4 by 62%, Usability also a 4 by 54%, and both Learning Outcomes and Cognitive Behaviour a 3 and 4, respectively, equally rated by 46%. Students with previous experience (so-called Minecrafters) playing Minecraft were able to design rapidly and support their own groups, while others found it difficult in the beginning to learn it while thinking about their designs. The Minecrafters used the game as a design thinking tool, while others used traditional tools such as hand-drawing and/or brainstormed orally their design ideas.

Mostly, the final designs proposed greening Florentine streets around the building complex and making it a car-free zone. Some proposed bringing back old uses such as the marketplace. The Minecraft geogame was useful for initial design stages which do not require architectural detailing, though its blocky and rough appearance. One

Figure 10: One of the scenarios proposed during the Minecraft online co-creation workshop. Printed with permission.

group of students stated that the tool '(...) is visually engaging and easy to change things in, creating easy consensus between a designing and commissioning group'.

One of the scenarios (Figure 10) proposed a change in tangible attributes such as urban and natural elements, as well as intangible attributes such as societal use. However, this last one was not possible to be explicitly represented in-game. The new urban condition between buildings included a car-free zone with a green sidewalk, plants, flowers, and benches. For such change in attributes, the following values were conveyed historic, social and ecological, e.g., local meeting point referring to a previous function as well as the reduction of urban heat island effect.

MASTER LEVEL

Three architecture students organised and conducted three different Minecraft co-creation workshops, to engage stakeholders to redesign three buildings and their surroundings, in Delft, the Netherlands, i.e., Prinsenhof, Cabel Factory, and Yellow Chemistry building complexes (Figure 11). The co-creation methodology was structured following the consensus-building process of the Geodesign workshop methodology (Campagna et al., 2016; de Andrade, 2019), where different stakeholder groups make their proposals individually, then start to merge with other groups by the similarity of design ideas while negotiating and compromising their tolerance for change. This is done until there is one last big group and one final design proposal which represents consensus through all stakeholders present in the workshop.

Students prepared a survey pre-workshop (Figure 12) about a values hierarchy related to attributes, informed by previous research (archival research, projects report review, and expert interviews) and their personal observation (e.g., Pokémon GO). Participants filled out the survey by making a hierarchy of high, average, and low values among a given list of attributes. Students elaborated a graphic to visualise

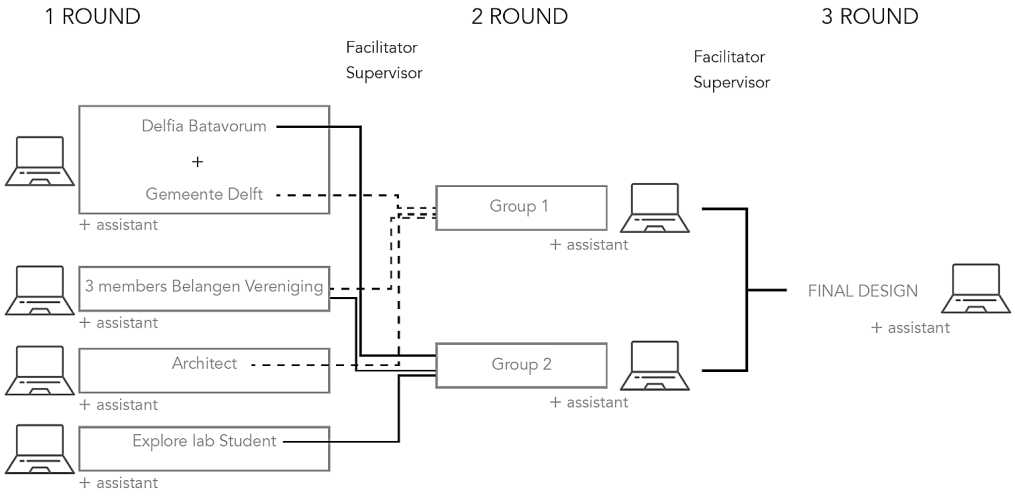


Figure 11: Minecraft co-creation workshop process (Ugnat, 2021). Printed with permission.

such hierarchy amongst different stakeholders to identify divergences and convergences in redesign decisions.

The translation [low value = demolish] is reductionist because a designer can turn low values into high values with their redesign. Demolition should not be the only solution. The only reason there is a direct connection between them in the survey was to keep track of the tolerance for change in attributes by the stakeholders during the workshop. For example, some of the recent buildings in the Yellow Chemistry complex were demolished in the game to restore the original public-private relation and create more open and green spaces. It was a compromise of the group representing the local historic association group with a developer group, whose counterpart agreed to conserve the main façade of the main street as it is.

The first task was to explore the building complex in the Minecraft geogaming model to find as many attributes that were on the pre-workshop survey list. Stakeholders were also allowed to use analog tools to support their design thinking process e.g., hand-drawing and consulting maps. Each stakeholder group had to make a redesign intervention according to their expertise and professional background. The workshop sparked interesting conversations supported by the in-game navigation. To illustrate such conversation, some opinions can be read on page 310 (Ugnat, 2021) (Table 3).

The representatives from the historic association of Delft were key in the workshops. Their position to conserve the building complex in its existing condition as much as possible triggered interesting, contrasting, and fruitful discussions over what /why to keep, adapt and remove. After this step, the students reflected using the partial and final designs and surveys with stakeholders to further develop their values-based redesign model to be in the context of their master's graduation thesis.

Further are illustrations (Figures 13 and 14) of participants' designs which inspired the design concept related to the new entrance, underground parking, new bike path, rooftop urban farming, and added volume (Ugnat, 2021).

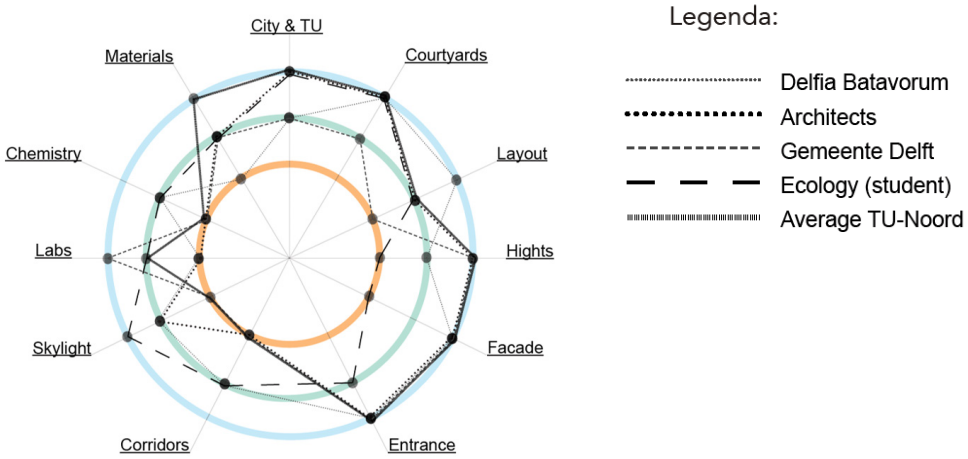
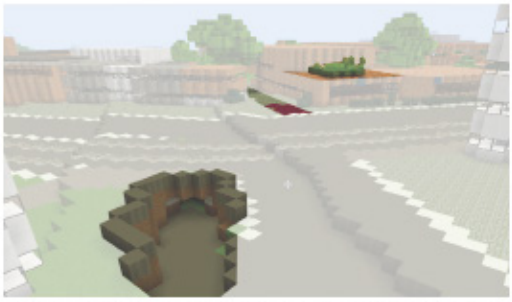


Figure 12: Values hierarchy survey of the Gele Scheikunde Building, Delft, The Netherlands (Ugnat, 2021). Printed with permission.

GEMEENTE DELFT	'Building ***conservation***, how can we keep the existing as much as possible, which is very important for the city and the government. (...) For the function, living and working can be combined. And concerning the living program, the target group are ***elderly*** 50+, with that comes the idea of what the elderly want, community services, caretaking which is in shortage in Delft. And another target group are ***young people***. So how to combine the mixed target groups, with living and working setting'.
DELFIA BATAVORUM	'It is very important to keep the outside so the ***skin*** as it is, that you can see how the buildings were built. Delfia Batavorum wouldn't agree on putting the extra levels and demolishing the buildings'.
ARCHITECT	'How can this enclave become a part of the city and still stay as an enclave as it is now. For that, the existing low perimeter can remain and be enhanced since it is very characteristic of the area. Another suggestion is to get rid of the added, residual blocks that don't contribute to the main ***typology*** of the site'.
BELANGEN VERENIGING TU-NOORD	'We live on the Julianalaan. We agree to conserve the outside of the complex. For us, the ***mobility*** is quite important'.

Table 3: Samples of redesign decisions per stakeholder (December, 2021)

Figure 13: One presentation and negotiation step of the Minecraft co-creation workshop (Ugnat, 2021). Printed with permission.



Upper Image 19: New entrance at Michel de Ruyterweg that connects courtyards by Group 1 (screenshot from the Minecraft model)
Lower Image 20: Underground parking entrance, new bike path (in red) and rooftop urban farming by Group 1 (screenshot from the Minecraft model)

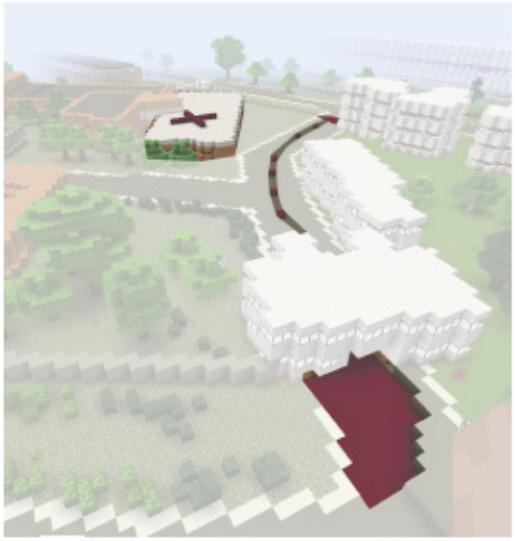


Image 21: New bike path in red. Autoclave lab (with a red cross on the roof) can facilitate bike storage by Group 1 (screenshot from the Minecraft model)

Image 22: Underground parking entrance (with greenery) and bike bridge (in grey color) by Group 2 (screenshot from the Minecraft model)

Image 23: Added volume on top of the buildings of Michel de Ruyterweg by Group 2 (screenshot from the Minecraft model)

Figure 14: Some of the stakeholders' redesign proposals (Ugnat, 2021). Printed with permission.

On the next page, follows a set of advantages and disadvantages collected by the students and tutors while facilitating and observing participants during the workshops. The notes were grouped, categorised, and analysed accordingly (Table 4)

ADVANTAGES	DISADVANTAGES
COGNITIVE DEVELOPMENT - It sparks creativity, playfulness, visualisation, negotiation, and problem-solving skills. - It offers countless colors, materials, and textures to mine and use. - Relatively simple controls (for computer and videogame consoles). **ACCESSIBILITY** - It can be played by all ages. - The Minecraft Educational Edition is free for educational institutions in some countries. - It has the option to work in a server, meaning multiple players can work at the same time. - Minecraft Educational Edition has a repository with lessons on different subjects, such as the city of Florence, Italy. **INTERACTION** - It can be played in single and multiple players, on almost all computers. **EXPLORATION** - Human perspective in the game. - Navigating through the 3D model is a good way of visualising the environment, especially when compared to 2D maps. - Navigating through the model works well as a design presentation tool, one can easily show which part of the building they are referring to. - Latest editions can use RTX (real-time rendering) and VR (virtual reality). **REPRESENTATION** - Minecraft works like a physical model which players can infinitely adapt. - It can be modified using mods (modifications) to fit a specific purpose, with endless possibilities. **DESIGN** - Design ideas and interventions can be easily and instantly translated and created. - By making use of the 1mx1mx1m block mechanic, Minecraft is a good way of abstracting environments. **VALUES-BASED DESIGN** - Values conveyed to the fabric of built heritage were partially identified, supported by prior knowledge. - Tangible attributes larger than 1mx1mx1m were detailed and illustrated, and consequently also addressed in their redesign decisions. - Conservation of Values and Attributes in Redesign succeeded when matching the personal values.	**COGNITIVE DEVELOPMENT** - Some participants have a tendency not to take the workshop seriously at the beginning of the process. - The wide range of materials overwhelms participants, so they tend to pick simple and obvious ones, especially in a rapid design workshop setting. - 3-4 hours seemed to be a time-demanding slot, even with breaks, yet some of the design ideas were not complete by the end of each round. **ACCESSIBILITY** - Older generations have more difficulty learning the controls and playing the game, though some showed will invest in it during the workshops. - Younger people tended to think, negotiate and design directly in-game, while older ones made drawings and talked first. **INTERACTION** - The most experienced players tend to dominate the design decisions and choice of materials, due to their power to being the 'mouse' of the group. **EXPLORATION** - Moving in the game is slow due to the human scale, also the map only opens up when approaching, making it hard to see everything at once. **REPRESENTATION** - It needs improvements to work in a dynamic workshop setting such as it is too slow to make extensive interventions at once. - The lack of accuracy and abstraction can lead to misunderstandings and uncertainties about built heritage. - Modeling and detailing large areas such as the Prinsenhof ensemble is time-consuming. - The use of NPCs (Non-player characters) and signs / whiteboards can be explored for a more in-game learning mechanic in built heritage studies. **DESIGN** - The 1mx1mx1m block mechanic is a barrier when proposing a change in details, making it more useful early on in the design process, as a design thinking and negotiating tool. **VALUES-BASED DESIGN** - Values that were not conveyed to the fabric of built heritage, or unknown were neglected. - Tangible attributes smaller than 1mx1mx1m cannot be detailed and illustrated, and consequently are also not addressed in their redesign decisions. - Conservation of Values and Attributes in Redesign failed when would not match the personal values.

Table 4: Advantages and Disadvantages of Minecraft.

4. CONCLUSION

GLEs can support training future architects by enriching their knowledge, skills, and attitude to engage a broader range of stakeholders to reveal the cultural significance (values and attributes) of built heritage and co-create their redesign. Both Pokémon GO and Minecraft revealed advantages and disadvantages in conveying values and attributes in-game. On one hand, both geogames gave more freedom for students to explore and identify (personal) values and attributes beyond expert-based sources, on the other hand, they also gave room for students to neglect critical values and attributes, and consequently not address them in their redesign decisions. A few combinations of values and attributes were conserved in students' redesigns, while others were neglected and destroyed.

Overall, students remain prioritising values other than their research. The cultural significance is rapidly defined and sources are poorly taken into consideration in their final redesign project. Both geogaming tools favored more tangible attributes while students focused more on pre-defined personal values related to their own redesign goal, mostly historic, social and ecological. When pre-defined values matched stakeholders', students were consistent and included in their redesigns. The university proved to be a meeting point where behavioral change can be fostered, encouraging people to become more proactive in their right to heritage. The students' work with stakeholders supported creativity and motivation in their redesign thinking process. They got empowered with GLE's active learning method to facilitate and communicate with clients/stakeholders in co-creation workshops. When compared to the traditional approach of redesign without stakeholders, students were able to take one step further becoming more inclusive and aware of how to incorporate values and attributes. Still, the mindset is not there yet.

STAKEHOLDERS

If cultural built heritage is destroyed with ulterior motives, human rights are violated. GLEs can be used as catalysts to bridge academics and citizens in built heritage management engagement processes, shifting and collaboratively upscaling the debate. This will potentially allow stakeholders to move beyond being spectators, a condition of passivity (due to inherent societal conditioning and/or to the limitation/imposition of regulation). GLEs can have a societal impact by fostering a culture of participation and raising awareness to the access to and enjoyment of cultural heritage.

STUDENTS

The teaching approach with GLEs is a work in progress, which is already related to specific learning goals, activities, and tools in different educational levels and contexts. There is more room to gamify these courses and classes, using points, levels, role-playing, quests, and multi-player to better motivate and maximise learning, engagement, performance, and societal interaction. Nonetheless, such an approach is also related to the teaching style and the teacher's personality, which can and should influence the GLE setting.

POKÉMON GO

Students became flâneurs in the city of Delft, the ones who walk, explore, and observe buildings and life accompanied by Pokémon creatures. They were able to identify new attributes, such as bridges, hidden pathways and courtyards, and street art. In-game descriptions allowed them to reasonably code values and attributes. However, some attributes lacked descriptions, making it hard to identify values, whilst intangible attributes were mostly neglected. The game, when adapted and curated by researchers and the company, to a historic setting as in the cases of Braga in Portugal, and Chester in the UK, worked better.

MINECRAFT

Students became Minecrafters, gaining facilitator skills in a co-creation workshop either in a role-playing mode in the city of Florence, Italy or with stakeholders of the city of Delft, the Netherlands. There is still a mismatch in the distinction of personal and collective values, the latter varying from age groups and cultural background. The teaching method contributed to raising awareness about the value of built heritage for society and their right to heritage. Though students were challenged to incorporate values of others than their own, most of them were biased and tended to incorporate only the ones that relate to their own. This reveals what could be a big challenge in higher education in Architecture – students are not trained to think collectively, but rather individually.

WHAT'S NEXT?

More research is needed on the effectiveness of GLE for scientific impact in built heritage education, relating learning objectives with activities and assessment (constructive alignment), and linkages to the practice in built heritage planning and management. Also, the effectiveness of societal impact is related to attitudes and behavioral change. One possible future of redesign belongs to gamers. The Minecrafters are already in the universities, but are architecture education ready for this new profile of students? This is still an open question to be further explored not only due to a post-Covid-19 architecture practice but also to better accommodate their capabilities and needs in higher education.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

LINA FEMINIST ARCHITECTURE WORKSHOP: INCLUSIVE VALUES ON ARCHITECTURAL DESIGN EDUCATION

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ABSTRACT

The LINA Feminist Architecture Workshop is an innovative pedagogical experience in the field of architectural design education with a gender perspective. Based at the GADU programme -Gender, Architecture, Design and Urbanism- of the Institute of Human Spatiality of the University of Buenos Aires, LINA was taught in eight architecture schools in Argentina and Latin America in 2020. The article reflects on the androcentric bias that has historically guided architectural production and training. It outlines the philosophy of LINA and the didactic strategies of its three thematic laboratories: Registers + Women Architects dedicated to making visible the work of women in urban planning and architecture, (De)Constructed Architecture(s) in housing and gender and (Inter)Sectional Landscapes focused on public space. It analyzes the contribution of feminist educational approaches to create an architecture based on values of inclusion, equity and social participation.

FEMINIST DESIGN, ARCHITECTURE, EDUCATION, GENDER, INCLUSION

1. INTRODUCTION

Architecture is not a neutral discipline, and it has historically been thought and legitimised from an androcentric perspective that has excluded women and minority, or minoritised, social groups such as children, older adults, and LGBTQI+ groups, to name a few. This has been reinforced by a binary perspective on spatial design - woman/male, private/public. In this scenario, a Feminist approach to design gains special relevance and becomes a significant way to investigate theories, methodologies, and actions that challenge and reverse inequalities, in order to ensure that all groups of a given citizenry have access and representation when designing the city and its architecture. The LINA Feminist Architecture Workshop is an innovative pedagogical experience in the field of gender-based architectural design education, held at several universities in Argentina and other Latin American countries. This workshop is part of a research internship for doctoral students and draws on the work of Wilhelmina Jansen (1904-1989), a Dutch architect and pioneer in applying feminist design.

2. ARCHITECTURE, GENDER(S), AND EDUCATION

Pedagogical models for courses on architectural design continue to be, in general, a masculine and masculinised territory. An example of this state of affairs can be found at the Faculty of Architecture of the University of Buenos Aires, in Argentina. Since its creation in 1901 as the School of Architecture in the Faculty of Physical and Natural Sciences, which would become the Faculty of Architecture and Urbanism in 1947, the number of women students has grown, and today they make up 60% of the enrolment and 58% of the graduates. The number of female teachers in all areas of knowledge at the faculty – design, technology, history, and morphology – also have an equal proportion in early career stages: 45% in assistant positions and 44% in teaching coordinatorships. But this balance decreases as one moves up the hierarchy, with only 34 % of female associate professors and 21 % of female full professors. (This data is taken from a Gender Report conducted in 2020 and based on faculty statistics from 2018.)

This situation is brutally intensified in the architecture design studios: there are 27 chairs with all male professors who are in charge of six levels of education – Architecture 1 to 4, Urban Project and Architectural Project. The 27 chairs have a total of 66 regular professors, i.e., they were appointed in public competitions, of whom only two are female architects (adjunct professors) and 64 are male – 23 full professors, 5 associate professors, and 36 adjunct professors. This data is taken

from a Gender Report conducted in 2020 and based on the 2018 FADU UBA regular teaching staff list.

The imbalance in the representation and perspective of women in architectural training at UBA is due to a multitude of factors. Firstly, the patriarchal model of the atelier persists, in which male architects are seen as the most suitable to lead the workshops. Secondly, there is no university programme that addresses women's needs or support their academic growth. This results in a high drop-out rate of female teachers when they have children and find they cannot combine teaching, professional life, and care work. Moreover, the different political in-groups have great influence over decisions over the curriculum, and gender equality represents an absolute loss of power for them.

Paradoxically, the Feminist movement has gained unprecedented strength at all levels of society in Argentina in recent years. The traditional feminist political and academic groups have been joined by rural, indigenous, and migrant women's organisations. Social mobilisation processes demanding women's and LGTBQI+ rights have increased, such as the massive march NI UNA MENOS (NOT ONE WOMAN LESS) a massive march started in Argentina in 2015 in which women gathered in 80 cities to protest the brutal increase of femicides in the country, then spreading to several countries in Latin America, Europe, and Asia. This led to important legislative achievements: the Equal Marriage Law (2010), the Gender Identity Law (2012), the Abortion Law (2020), and especially, the Micaela Law (2019). Named after Micaela García, a twenty-one-year-old girl raped and murdered in April 2017 by a man with a history of sexual assault, it establishes mandatory training on gender and violence for all people working in public administration and educational institutions.

This feminist impulse was also reflected in the field of architecture, where numerous initiatives emerged putting the role of women on the agenda: research teams, courses and seminars, feminist student groups, and networks of professional women. It is worth highlighting the work of Inés Moisset, who has generated pioneering research spaces and networks to make visible the contributions of women in architecture, urbanism and landscape, such as the blog Un Día / Una Arquitecta (One Day/ One Female Architect). This project, created in 2015, publishes the biography of a female architect daily on social media networks. Its aim is to make the contribution of female architects in different facets visible: architectural, urban and landscape design, technology, curatorship, and publications, artistic production, politics, social habitat management, theory, and teaching (see https://undiaunaarquitecta.wordpress.com/).

As a beacon for feminists everywhere, Ana Falú, an Argentinian architect, academic, and feminist activist, is undoubtedly the one who has paved the way for reflecting about women's rights and diversity, as well as initiated discussions on how to design cities free of violence and injustice nationally and internationally

(Falú, 2002). As a student, she became involved in political organisations working in 'villas' (informal settlements) and vulnerable neighbourhoods. She graduated as an architect at the University of Tucumán and did her PhD at TU Delft in The Netherlands under the supervision of Chilean associate professor Marisa Carmona. At the University of Córdoba, she was professor in charge of an architecture design studio. She is the director of the Latin American Women and Habitat Network and Coordinator of the Gender Equality Unit of UN-Habitat. As Falú points out, feminist architecture has an enormous transformative capacity in political and social, territorial, urban, and spatial terms:

> From feminism we learned that it is necessary to construct objective and verifiable arguments in order to deconstruct 'naturalised' discriminations in society and, at the same time, to transform the place of 'otherness' in which science and philosophy have placed women, as well as other social subjects, for millennia. (Falú, 2009, 27)

Building on this rich history of Feminist struggles in Argentina, we are interested in debating the question of public space, the public and the private as political dimensions. The city as a space to be experienced; the streets, squares, routes, meeting places, as places of recognition and dialogue between citizens and between the diversity of citizen identities, and between these and the state. A city where women appropriate their rights and reclaim the streets, extending the discourse of recognition of rights to other excluded groups (Falú, 2009, 29).

It is significant that design studio courses, being one of the nodal academic spaces in terms of reconfiguring the built environment, are almost absent from current discussions about gender inequalities. This is probably rooted in the fact that architectural courses in Latin America have not been able to completely overcome the pedagogical models of the 19th century that posited a general subordination of the feminine at all discursive levels in architecture.

The Beaux-Arts atelier, the predecessor of our present-day design studios in Argentina, clearly valued the idea of reflection in action, typical of a discipline that is learning-by-doing. However, the atelier replicated the prevalent patriarchal culture: it had the leadership of a recognised male figure, a vertical way of transmitting knowledge, and the aspiration of the group of students to build a canonical work in the image and likeness of the atelier's patron. Designed by and for men of reproductive age, and from a relatively well-off social class, this model naturally led to the exclusion not only of women but also of other men who fell outside the norm.

The beginning of the 20th century represents the moment when women began entering architecture schools in a context that, both socially and at university level, understood the male architect as the most suitable actor for professional practice. The focus on male architects was a worldwide phenomenon. As an example, in the

Netherlands, the Technische Hogeschool in Delft clearly discouraged women from pursuing architecture. Its study guides of 1932 and 1935 warned that technical studies and the practice of the profession would place too heavy demands on women's physical capacity (Heijkoop & Bakker, 2010).

Later educational experiences, such as the innovative Bauhaus school founded in 1919 by the architect Walter Gropius, did nothing to dissuade this idea. The school was promoted as a place of equality for female students, resulting in an enrolment of 84 women and 79 men in the first year. However, as Moisset points out: 'The teachers (all male) felt surprised as they did not want the school to become a space for female crafts, but wanted to be recognised as a school of architecture (traditionally a male profession)' (Moisset, 2020).

Gropius determined that the school could have only one-third female students. Of the three main subject fields of the school at its founding, Handwerk (craft), Kunstgewerbe (applied art) and Freie Kunst (visual arts), the first was the one in which women were to specialise and only those with 'exceptional talent' could apply to the other two. Thus, female students were pushed into bookbinding, ceramics, and textile workshops. Charlotte Ida Ana (Lotte) Beese (1903-1988) was the first woman to gain admission to the Bauhaus architecture workshop in 1927, eight years after it was founded. Despite its avant-garde image, Bauhaus severely discriminated against women. For example, when Beese enrolled in the furniture workshop, the professor in charge, the architect and designer Marcel Breuer, refused to accept her because, in his opinion, furniture making was not suitable for women. Her admission was reconsidered when three more (talented) women applied for his workshop. In 1929, she left the school without graduating and worked in various places in Europe – Berlin, Vienna, Brno – until she settled in the Netherlands in 1934. In 1940 she entered the Amsterdam Academy of Architecture where she finally graduated as an architect (in 1945). In 1946 she began her work as director of the Department of Urban Development and Reconstruction in Rotterdam, where she produced several of the most significant urban designs of modernity: Kleinpolder (1947-1952), Pendrecht (1949-1952), and Alexanderpolder/Ommoord (1957-1971).

An innovative educational programme was the Women's School of Planning and Architecture – WSPA – founded in 1974 by Katrin Adam, Ellen Perry Berkeley, Noel Phyllis Birkby, Bobbie Sue Hood, Marie Kennedy, Joan Forrester Sprague, and Leslie Kanes Weisman. From the early 1970s, its founders met in professional organisations and attended the first women in architecture conferences (1974, 1975). These meetings allowed them to visualise the lack of a women's perspective in the professional and academic spheres, as well as to think of an alternative training proposal to reverse this lack (Cahn, 2014).

WSPA asserts that:

> [...] that a feminist education must consist of two equally important factors. One is the analysis and evolution of information, theory, and ideology. The other is the development of an actual context which reflects those values. A feminist analysis, and even the generation of new ideas, can take place in many environments, including establishment academic institutions. A feminist education cannot. It must synthesise the two factors of analysis and context: the intellectual with the experiential, the facts with the behaviour, the ideology with the structure [...]. Learning in this sense is holistic, and it cannot be achieved under a traditional hierarchical system whose organization and methods deny the fundamental tenets of feminism – no matter how radical the concepts, rhetoric, and visions are, or who expresses them (Weisman, 1983, 245).

WSPA applied feminist ideas to its pedagogical structure. The school had an organisation where teachers and students actively participated in the design of the curriculum, dissolving the role of expert professors as the only authorised voice. In terms of content, the theory and practical activities were oriented towards contemplating the problems of women in the design of the city, a view that had been almost completely suppressed in architecture schools and studios. It is also worth mentioning that WASP had a childcare program that favoured the attendance of women with small children.

The Women's School took the format of a two-week summer course to create an atmosphere of personal support and a stimulating exchange of ideas in a holiday environment. It was based on fostering personal and professional growth through a fuller integration of values and identities of women as designers, creating a space to discover the qualities and skills that women bring. WASP held five sessions in various cities in the United States: St. Joseph's College in Biddeford, Maine (1975), Stephenson College in Santa Cruz, California (1976), Roger Williams College in Bristol, Rhode Island (1978), Regis College in Denver, Colorado (1979), and a weekend symposium in Washington, D.C. (1981).

Five decades after WSPA, data on school of architecture of the University of Buenos Aires mentioned at the beginnig of this chapter show that there is still a need for educational processes with feminist values. This implies being able to displace and translate some relevant features of feminist theory into the field of architectural design.

According to Diana Maffia, feminism, despite its evolutions and many interpretations, accepts three principles. Firstly, a descriptive principle that recognises that women are at a disadvantage in all societies. Secondly, a prescriptive principle that values these asymmetrical relations as a problem. Thirdly, a practical principle or actions to prevent and change gender inequality (Maffia, 2008).

According to Leslie Kanes Weisman, one of the most important responsibilities of architectural feminism is to heal this schizophrenic spatial schism (dividing the private-public spheres) and to find a new architectural language in which the 'words', grammar', and 'syntax' of work and play, intellect and feeling, action and compassion are synthesised. Thus, overcoming the conflict of identifying women exclusively with the space of the home (nurturing, cooperation, subjectivity, emotionalism, fantasy) and men with the world of public events (objectivity, impersonalisation, competition, rationality) (Weisman, 2003).

Architecture, with its project-based education, is not a discipline in the traditional academic sense. On the one hand, it is not supported by a single definable body of knowledge, but integrates diverse methods and theories from the physical sciences, the humanities, and technology. On the other hand, all this diversity of knowledge cannot be manipulated on the basis of a single organising principle or a central intellectual paradigm. On the contrary, architecture is organised through creative action: design. This implies open and flexible processes that often lead to the emergence of new configurations or unknown orders. The project is the moment of synthesis where applied knowledge comes together, that is, 'reflection in action' (Schön, 1983) and the point where material and symbolic decisions are balanced and articulated.

Far from being a static field, design knowledge is transversal and evolving knowledge that adapts to the different conditions of its context. In this sense, the gender perspective emerges as new knowledge with inclusive values, as well as a political tool to denounce and transform the spatial injustices of patriarchal culture:

> The gender perspective involves integrating a strategic design approach that allows for an assessment and intervention of inherited heritage with criteria of greater equity and inclusion. It is about exploring theories, methodologies and operations that question and reverse the phenomena of inequality in order to ensure that all social groups of a citizenry have access and representation to tangible and intangible heritage. Although women represent one of the most impacted groups, the gender perspective is not only a question of women but also of considering those abjected by gender, ethnicity, class and age (Quiroga et al., 2018, 2458).

Similarly, intersectional approaches (those that interrelate the social categories of gender, class, ethnicity and more) become relevant to analyse the processes and mechanisms by which social groups are excluded from or dominate the sphere of culture, as well as influence the narratives of public cultural institutions to construct identities, feelings of representation and nationality (Crenshaw, 1989; Grahn, 2011).

In this context, I considered it necessary and urgent to create a feminist architecture workshop at the University of Buenos Aires. With architect Juan Alonso, we've developed a programme that, although young (2020), is the result of a long

trajectory as teachers of architectural design studios (23 and 14 years, respectively), the teaching of the seminar Heritage and Gender, and the workshop OUR WOMEN ARCHITECTS, together with Inés Moisset (Moisset & Quiroga, 2019, 2021). This vast experience, combined with our feminist militancy, allowed us not only to develop the knowledge and the tools necessary for this project, but also to know what pedagogical values prevalent in architectural education needed to be changed.

3. THE FEMINIST ARCHITECTURE WORKSHOP

In 2020, LINA Laboratory of Intervention + Architecture, a global platform for research and design experimentation, started the Feminist Architecture Workshop for architecture students at the University of Buenos Aires. Its educational format is that of a research internship with academic credits (equivalent to a 60-hour elective) linked to the project 'Heritage and Gender Perspectives: New criteria for evaluation and intervention in the work of Wilhelmina Catharina Maria Jansen'. Due to the context of the COVID 19 pandemic, it was initially planned as a virtual course.

When the dissemination on social networks began, we received a large number of requests from local and international students interested in participating in the workshop, and so we decided to open the call to other institutions. The workshop was finally organised with 115 students from 8 schools of architecture from different cities in Argentina – Universidad de Avellaneda, Universidad de Buenos Aires, Universidad de Córdoba, Universidad de Cuyo, Universidad de la Plata, Universidad de Tucumán-, in Bolivia – Universidad Mayor de San Andrés – and Uruguay – Universidad de la Republica.

The main goal of the workshop is to reflect and explore the gender perspective as a strategic design approach that allows for the design and re-design of the habitat with criteria of greater equity and inclusion. Particular learning objectives are:

_To introduce the notions of feminist architecture, its challenges, and current opportunities

_To provide conceptual, methodological, and operational tools to approach the design field with a gender perspective

_To explore the advantages of integrating a feminist perspective in the processes of transformation of the territory and urban-rural cultural landscapes

_To contribute to the development of an emerging field of knowledge in architecture

Figure 1: Re-thinking architecture with feminist values. Wordcloud: What are the main characteristics of feminist architecture? Source: LINA Plataform Archives, 2020. Images by author.

Because of its link to a research project, one of the thematic axes of the course is the Dutch architect Wilhelmina Jansen (1904-1989), a pioneer in the application of a feminist perspective in architecture. Jansen studied architecture at the Delft University of Technology and graduated in 1931. She designed the RVS Flat women's housing block in Rotterdam, a building promoted by the Rotterdam Women's Centre Foundation – made up of seven departments of national women's institutions – which sought equal access to social housing for single women. Jansen realised a large number of less famous housing projects, building renovations, and gardens design. She was an active participant in several women's organisations such as the Association for Academically Educated Women and the Women's Advisory Committee for Housing and the Environment (Vrouwen Advise Commissie). Like many women architects, Jansen's work is still not sufficiently researched and therefore does not get the recognition her valuable legacy deserves.

The course is organised into three articulated thematic modules. Each of the modules is centred on a Design Laboratory supported by theoretical classes and instances of debate and collective reflection.

-Module 1. [R] Lab. Registers + Women Architects

The proposal consists of the study and registry of works by women architects, taking the work of Wilhelmina Jansen as the main study case. It introduces a critical reflection on the problem of the invisibilisation of women architects. The students analyse the trajectory and re-draw the works of women architects. This process allows them not only to value the heritage built by women architects but also to integrate their ideas as a theoretical and instrumental input in their own design processes.

-Module 2. [D] Lab. (De)Constructed Architecture(s)

The activity proposes to reflect and investigate concepts and operations of gender equality on the scale of the architectural project from a feminist perspective. The design of the individual home was taken as a central theme in order to deconstruct the gender stereotypes that have historically been assigned to housing.

-Module 3. [I] Lab. (Inter)Sectional Landscapes

The exercise consists of researching feminist approaches to landscape design. Each group of students selected a public space as a study case. First, they re-map the urban, spatial, and functional conditions from a gender perspective, as well as the symbolic aspects that produce imbalances in the use by the whole community.

LINA is based on a pedagogy of project research, in line with the idea of the workshop as a space for the collective construction of knowledge, where the teachers are the motivating agents of the different personal searches. The classes have three types of dynamics. The first are lectures and seminars that provide the theoretical-conceptual framework and referential support for the themes. The second are territorial tours with a gender perspective. And finally, the practical workshops where the participants reflect on and experiment with these concepts.

During 2020, a series of lectures by leading figures in research was organised virtually, addressing architectural practice and urban design with a gender perspective. The speakers included Inés Moisset (CONICET/University of Buenos Aires), Eva Álvarez and Carlos Gómez (Polytechnic University of Valencia), María Novas-Ferradás (University of Seville, Delft University of Technology), Verónica Benedet UNESCO Chair Landscapes and Heritage, University of the Basque Country), Natalia Czytajlo and Paola Llomparte (National University of Tucumán), and Patricia Santos Pedrosa (University of Lisbon).

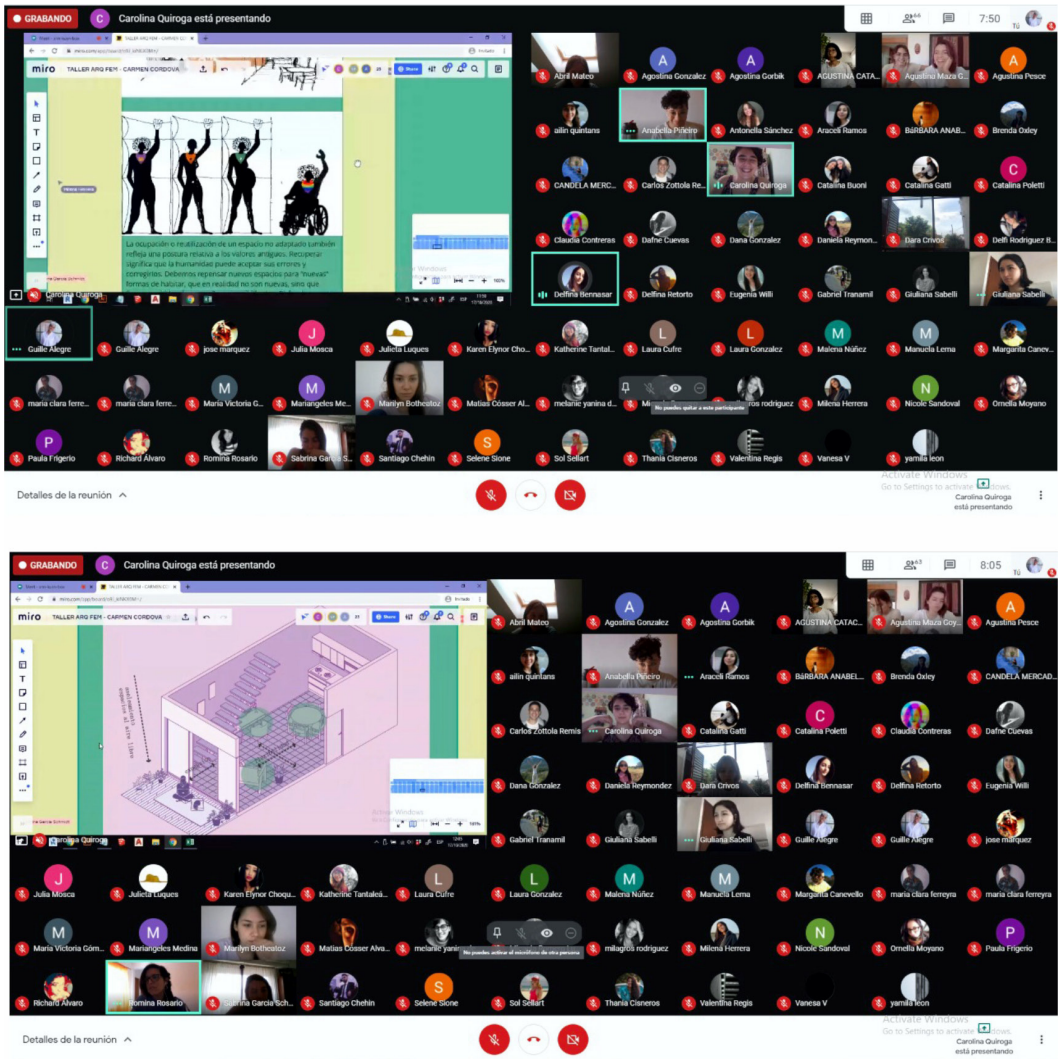

Figure 2: Architectural training with feminist values. Source: LINA Platform Archives, 2020. Images by author.

The LINA team includes people with different levels of training, interests, and experiences: architects Yamila González, Guille Alegre, Juliana Kersul, and Marlyn Boatheatoz, and architecture students Giuliana Sabelli, Sela Sansalone, Emilia Di Felice, and Carolina Jara.

4. DESIGN OPPORTUNITIES

The process and outcomes of the workshop exceeded our expectations. The students actively participated in the discussions and exercises, but their participation was notable because it was they themselves who made a strong critique of how they had learned architecture. Students mentioned, among other issues, the small number of female professors in the design studio courses, the learning process based

on the 'corrections' of mistakes, instead of encouraging imagination, the absence of works by women architects in the bibliographies, the selection of generic and/or elitist architectural programmes without considering the users.

In general terms, one of the distinctive aspects of the proposals developed is that they were oriented towards notions that erode traditional design values strongly traversed by patriarchal culture such as heteronormative patterns and dichotomous systems (female/male), putting forward instead gender perspectives, intersectional perspectives, feminist urbanism, ecofeminist urbanism, queer urbanism. Although progress in the discussion of these concepts has been made, there is little practical work done with these concepts. Therefore, the biggest challenge for the students was how to translate this theoretical knowledge into concrete feminist design decisions.

In terms of housing, the experimentation with the architectural programme stands out. Some students approached the house for different family dynamics – two-par-

Figure 3: Housing with inclusive values, [D] Lab. (De) Constructed Architecture(s), LINA 2020. Authors: Antonella Maurici, Josefina Echaniz, Gala Cabrera, Victoria Prillo, Faculty of Architecture, Design & Urbanism, University of Buenos Aires. Source: LINA Platform Archives, 2020. Printed with permission.

ent households, single-parent households, extended families – proposing non-hierarchical spaces that help women to integrate into productive life and favour childcare tasks: rooms with flexible use, gardens with playgrounds, functional kitchens. Other programmes focused on how to include people with disabilities or older adults in the home, with proposals that tended to make any design adaptable to specific requirements. Some groups explored housing with human groupings not based on the family structure, which gave rise to new relationships between the individual and the collective, by e.g. atomising kitchens and connecting various living rooms.

In the case of the rehabilitation of public spaces, the students selected very diverse sites: main squares in their cities, boulevards, urban parks, neighbourhood squares, urban voids in marginal areas, the centre of urban blocks, mass housing developments, their university campuses, among others. This multiplicity of scales and programmes not only allowed for rich reflections on intervention processes and operations, but also exposed the fact that, in most cases, there were severe conditions of symbolic and spatial discrimination, even in recognised and preserved heritage sites. Thus, the workshop faced 'the challenge of building a space without gender or patriarchal order, therefore without hierarchies, a space to make differences visible, a space for everyone with equal value of views, knowledge and experiences', to cite the words of Argentine feminist architect Zaida Muxí (González, 2016).

One of the most noteworthy aspects of the projects was to recover the political role of architecture. In this sense, some interventions included cultural itineraries to tell the story of the transgender community, spaces for LGTBQ+ marches, or social assistance facilities for gender violence, a severe local social problem.

It is worth noting that in Latin America, every two hours a woman dies as a victim of feminicide, that is, she is murdered simply because she is a woman. In Argentina, the isolation caused by the COVID 19 pandemic led to a notable increase in cases of domestic violence against women and girls. Similarly, femicides increased from 280 (2019) to 295 victims (2020). These numbers highlight the importance of challenging patriarchal paradigms in architecture.

Democratisation and equitable access to public space were other themes of design research. Although each case study had particular challenges, common themes emerged when defining rehabilitation strategies such as safety (lighting, signage), accessibility, the creation of areas for all ages and genders, places for play that favour children's autonomy, among others. In addition to spaces for leisure, recreation, and sport, the projects also combined productive landscapes such as urban allotments and community gardens. Especially in low-income areas, these places strengthen the social fabric and the popular economy.

Figure 4: Public space with inclusive values, [I] Lab. (Inter) Sectional Landscapes, LINA 2020. Authors: María Delfina Bennasar, Anabella Piñeiro, Carlos Zottola Remis and José Enrique Márquez, Faculty of Architecture and Urbanism, National University of Tucumán. Source: LINA Platform Archives, 2020. Printed with permission.

5. ARCHITECTURE WITH FEMINIST VALUES

The design teaching-learning process requires not only to interpret the profound social, political, environmental, and spatial changes of the current complex context, but also to produce a critical revision of the traditional values that guide spatial design. In this sense, LINA integrates the feminist perspective not as just another variable in the design, but as a true attitude towards all architectural problems, contributing a whole series of new value criteria:

-Ethical values: feminist architecture understands the discipline as a social practice whose aesthetic quests are aimed at transforming and improving the quality of life of people, transcending mere formal exploration or the production of objects empty of content.

-Human values: in the new awareness of human rights that extends to the various areas of knowledge, the gender perspective represents an instrument that guarantees equal access for all citizens.

-Historical values: in recent times, initiatives aimed at making visible the contributions of women in architecture, urban planning, art, design, and landscape architecture have grown, making it possible to review the androcentric ways by which architectural history has been written and taught.

-Conceptual values: the theoretical and operational argumentation of architectural design is one of the relevant topics of their training. Design processes with gender approaches are a platform for experimenting with new criteria of inclusion, diversity, and equity.

-Functional values: the traditional form-function-user dilemma should not respond to a universal and abstract user but should explore architectural programmes that contemplate the multiple needs – gender, age, disability – of a place's social fabric.

Our current times highlight the fact that we find ourselves with ‘the need to negotiate between established paradigmatic categories and the fact that the empirical territory in which they were generated is unstable’ (Sassen, 2014) . Many naturalised values and concepts that have served for decades in architecture are weakened by the instability of the conditions that these categories seek to capture. Even if those paradigmatic categories can capture those values, they undergo radical changes (even if only partially). In this context, exploring alternative paths and more flexible pedagogical forms, such as feminist approaches, is one of the great challenges and opportunities of architectural education.

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TU DELFT STUDENTS AT WORK. PHOTO BY R. ROCCO.

KNOWLEDGE
EARTH

DESIGN VALUES FOR EXPERIENCE

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ABSTRACT

This chapter addresses the formation of values through experiential learning and the incorporation of otherness in the subject Architectural Design IV, section 425, of the Architecture School of the University of Lima. The methodology and steps carried out within the practical teaching-learning process will be presented as a replicable good practice in order to raise awareness about the fundamental role that the user has in any architectural project. The course raises students' awareness about the need to include a diversity of users (with and without disabilities), and about accessibility and the concept of universal design in the development of their design proposals. This methodology has been used since 2018. This chapter is part of the author's doctoral research. It developed under a qualitative research paradigm using multiple observation techniques. The selected populations are students of the Architecture School of the University of Lima and the sample corresponds to the students enrolled in section 425 of the course Architectural Design IV. Depending on the cycle, there can be 12 or 24 students.

ARCHITECTURAL EDUCATION, INCLUSION, VALUES IN EDUCATION, SOCIAL RESPONSIBILITY, OTHERNESS

1. INTRODUCTION

Michel Foucault tells us that 'An experience is neither true nor false: it is always a fiction, something constructed, which exists only after it has been lived, not before; it is not something 'real', but something that has been reality' (Foucault in Faubion, 2001: 243). This article addresses the formation of values through experiential learning and the incorporation of otherness in the subject Architectural Design IV, section 425, of the Architecture School of the University of Lima. This is important because...

Architectural education in Peru lasts five years. My students, in the subject Architectural Project IV section 425 of the University of Lima, belong to the second year. This is a compulsory course and belongs to the area of Architectural Design. During the previous courses in this area, students acquire knowledge about architectural composition and representation, function, anthropometry, and elaboration of the architectural programme. As Carolos Labarta explains in the presentation of the book Teaching Methodology of the Architectural Project (Labarta & Bergera, 2011), the subject of the architectural projects is understood as the axis of training where other subjects in architectural education converge. This has traditionally been the way we have understood architectural design subjects in Peru.

The learning of the project, with all the load of its creative and poetic condition, cannot be transmitted without a strong and up-to-date conviction in the content of the teaching itself. Teaching becomes the intravenous transmission of enthusiasm, of passion guided by reason. Going through the other side of the mirror, teaching should become an enthusiastic and intoxicating game, whose satisfactions will be proportional to the objective difficulty of the challenge (Labarta & Bergera, 2011: 14).

What would happen if we understood education in a reciprocal way, in which architectural education feeds on knowledge from other areas, but also gives those areas new knowledge? What would be the element or situation in which all the subjects of architectural education come together? I dare to propose that this meeting point are the users.

How aware are architecture students about the diversity of users and their needs? How to make them understand the importance of users in any architectural project? Users are the reason why architecture exists and also the reason it changes. How do we prepare our students to understand the complexity that surrounds every human being? A complexity that entails certain design variables, because we do not only have different interests and needs, but also different capacities and abilities and therefore, different ways of perceiving architectural space and of relating to our peers. How do we get our students to understand and respect these differences?

I believe that the best way for students to become aware of the implications of their professional practice is to confront them directly with reality through different experiences that the object offers them. This chapter presents these experiences as approximations to encounter this reality, especially the reality experienced by a group of people who are often forgotten and neglected in architectural projects, that is, people with disabilities. The course confronts students from the outset to get out of their comfort zone and puts them 'in the other's place' which is finally what an architect should do every time they start a new design. The different experiences are opportunities for reflection for each student, who in turn go through the different stages of learning (of artistic disciplines) that Asger Jorn talks about in 'Notes on the formation of an imagistic Bauhaus', (quoted by Juarez in Labarta & Bergera, 2011): stupefaction as the initial stage where something surprises us, experimentation as personal work, and finally, possession as the result of the internalisation process. All these experiences lead to design strategies that allow students to approach an architectural assignment aware of the importance of knowing and understanding the users.

2. STUPEFACTION
AS THE INITIAL STAGE

The course has an ambitious goal, that is to make students aware of the importance of understanding the diversity of users. For this, they must first recognise themselves as individuals who are part of a group. The first step to achieve this is to 'break the ice' (Figure 1). This is important because it allows students to meet and interact with the rest of the course members (who they will see and with whom they will work for 16 weeks, 9 hours a week).

Our learning begins with a review of the bibliography on 'universal accessibility' and 'universal' or 'widely accessible' design, as well as national regulations on those topics. This allows students to understand the importance of thinking about accessibility from the outset and, at the same time, realise that, as far as regulations are concerned, we still have a lot to do in Peru. They then see the need to investigate and review the regulations of other countries in order to make a comparison and be able to recognise good criteria in terms of accessible design. But this is not enough to make architecture. It is not enough to understand how the users use the spaces and how the spaces that the architect designs affect the development of life in different aspects. This is how the next step in the methodology of the course is given: experimentation.

Lima is a city where most sidewalks measure between 80 and 100cm wide. Where it is 'normal' to see parked cars on the sidewalks. Where it is 'normal' for the pedestrian to stop at every corner, every traffic light, and every intersection to

give way to vehicles. Where it is 'normal' to think about expanding car lanes before expanding the spaces where people circulate. Jane Jacobs already said (in an interview conducted by Eve Auchincloss and Nancy Lynch) 'We are sacrificing all kinds of services in favour of cars. I think we could reduce their number by giving way to other needs we have. It is about a change of values' (Auchincloss & Lynch, 2019: 12).

The pandemic showcased the lack of awareness by authorities of the kind of people who live in cities like Lima. It made it clear that no thought was given to how these places of circulation that people pass through on a daily basis should be. What do they find on the way? Can they find rest points along their route? Many times, there are no sidewalks and people must walk along the road hoping that no car runs them over.

'When, consequently, pedestrians are forced to keep to the right of the street to traverse it, the freedom of movement has more or less been lost. People no longer meet, but walk in line one behind the other. The overcrowding is too great' (Gehl, 2017: 148).

Figure 1: Group presentation development Architecture Project IV section 425, 2019. Photo by author (2019).

3. EXPERIMENTATION
AS PERSONAL WORK

Figure 2: Students of the course learning to be guided using the tracking technique. Photo by author (2018).

Many students, at this point, had not yet become aware of the diversity of users that inhabit cities and with whom we interact to a greater or lesser extent every day. Few knew, within their social circles, a person with a disability. This stage in the course is called 'Experimentation' and is composed by different activities exploring otherness as 'personal work' (Figure 2).

In the first activity, the students tour the city of Lima using a wheelchair. They choose the area to visit and do it during the weekend, outside class hours. The only condition is not to get up from the wheelchair and try to make all the routes that the visited place allows. This activity is done in pairs and has two moments. At first, student 'A' is in the chair and student 'B' is the one who pushes the chair, then they exchange roles so there is an exchange of experience. In a second step, each one goes alone in the chair and must push the wheels by themselves to be able to move forward. The activity closes in the classroom with the exchange of the experiences obtained, addressing a list of all the problems or inconveniences faced.

In the second activity, the students visit different museums in Lima. They decide which museum to go to and use the methodology applied in the first activity. In the tour of the museums, they realise that many not only do not have entrance ramps, but also that the routes inside do not allow comfortable movement in a wheelchair. The museums that do have access ramps do not have them located at the

main entrance where the museography begins. The ramps, when there are any, are located in the middle or at the end of the route. This completely affects the visitor's perception of what is on display. Something as simple as the location of a ramp can completely change the user experience. Added to this are different situations such as, for example, that the exhibited objects are well above the height of a person in a wheelchair. These two initial activities aim to recognise the importance of accessibility for people with physical disabilities.

The following activities seek to understand the importance of sensory accessibility. In order to carry them out, we visited the C.E.B.E. San Francisco de Asís located in the district of Santiago de Surco, Lima. This visit is coordinated and organised in advance with the director, a team of teachers, and psychologists from the C.E.B.E. mentioned. The activity begins with a presentation by the management about the history and mission of the C.E.B.E. Then there is a guided tour of the facilities by a team of teachers appointed by the management. Finally, the activity directed by the team of psychologists from C.E.B.E., which consists of students putting themselves in the place of a person with total visual impairment and learning to move using a guide cane, learning to use the podo-tactile floors and the 'tracking' technique as a method of tactile orientation. All activities are carried out within the C.E.B.E. and are guided by the team of psychologists at all times. At the end of these first activities, architecture students learn to be sighted guides, which means learning to guide a person with total visual impairment. They learn to offer help, to place the arm so that the blind person can hold on and finally to accompany and guide the person with visual impairment. From experiencing 'otherness', they learn to respect the time and space of 'others'.

These activities allow the architecture students to be aware of their neighbours and the need for accessibility that exists. The important thing is not only to experience the city and architecture from the perspective of 'otherness', but also that, through these experiences, students become aware of their own bodies, their own senses and realise how little attention we pay to our senses, as well as how little we know how to orient ourselves and guide ourselves using something other than sight. Moreover, they understand how little space we give to spatial experimentation through our senses, our bodies.

The pandemic, as we already know, changed the way we relate to others. But with the pandemic also came the virtualisation of classes, a first-time experience in the Architecture School of the University of Lima. Virtuality brought new possibilities for experimentation, with few limitations (Figure 3). The students received a visit in class from different architects around the world who shared with them their design and academic experience around accessibility and universal design. Teachers from C.E.B.E. also visited us in class, carrying out different awareness activities with students in a virtual way

4. APPROACH TO THE USER

AS A PROCESS OF INTERNALISATION

Figure 3: Virtual sensitivity workshop at the course Architecture Project IV section 425. Photo by author (2020).

Understanding the importance of contact with our own senses and recognising that we are all part of larger groups, students become aware of the importance of connecting with users and understanding their needs. The users with whom we interact in the course are children, since there is no more honest perception than that of a child. To know something, to understand something, children are not afraid of experimentation, and they do it using all their senses. To contact children with disabilities, we made a second coordinated visit to the C.E.B.E. San Francisco de Asis (Figure 4). For many architecture students, it was the first time they had seen or approached a child with a disability. Probably, without the previous experiences, the reaction to the first meeting would have been very different, many would have averted their eyes or turned away. How easy it is to look the other way and how often we do that. I was pleasantly surprised by the naturalness with which my students talked, interacted, and gave themselves the opportunity to be human, to meet others, and learn from these approaches.

There is no better way to establish contact with others than doing it naturally in everyday life and that is why for this stage I coordinate and organise a joint visit to a museum in Lima. Museums and their characteristics in terms of universal accessibility, at this point in the development of the course, are no longer foreign to my

Figure 4: Visit to a museum in Lima, students from the University of Lima and C.E.B.E. San Francisco de Asis. Photo by author (2018).

students. Each student of architecture in my charge accompanies a student of the C.E.B.E. in this experience.

We were surprised that after walking for a long time around the museum, where everything is protected by glass, Walter, a boy with total visual impairment, asked us if the only thing they were going to 'see' was glass. For a totally visually impaired child, a museum of this type is nothing more than a series of spaces where 'there is nothing'. There is no spatial or sensory experience. In that sense, why would museums be important for those children if they are spaces where 'there is nothing'? The museum we visited temporarily prepared a room with a series of replicas where children, for the first time in their lives, could touch objects inside a museum. Feel the weight of the object, the material, the temperature, smell, etc. The senses allowed them to enjoy a complete experience for the first time.

The inclusive museum movement arises from the need to promote cultural democracy. The inclusive museum is an organization, ambitious in its spirit and purpose, which aims to facilitate a multisectoral and interdisciplinary dialogue that transforms museums into civic spaces for the protection of the tangible and the intangible; of the natural and the cultural; and both movable and immovable heritage (Galla n.d.).

For their part, the architecture students, through the experience of real proximity, were able to realise how the architecture we design directly affects people. It affects whether they feel comfortable or not in the space, but it also influences how a person relates to others in that space. Without understanding our users, we will not be able to understand our role as designers.

5. POSSESSION
AS THE RESULT OF THE INTERNALISATION PROCESS

It is only then, after all these activities and experiences, that the students begin their design process. They all receive the same architectural commission. They all perform the same preliminary steps: analysis of the context, analysis of the plot, understanding of the typology through the analysis of references, etc. Each design decision will be defined by the different experiences carried out throughout the course and, above all, how each of those experiences personally affects each student, each future architect.

We believe that the consultations and discussions should take place during processes and not during deliveries. As students that we once were, we are very clear that the doubts, insecurities and uncertainties occur almost entirely in the moments of project production (Eliaschev, Garrido & Encabos 2014: 61).

The subject not only generates concerns and discussions throughout the design process (Eli-aschev, Garrido & Encabos 2014) among the enrolled students, but also the reflection of transversal learning between the design subjects and the other academic areas in the curriculum. For this, I call on teachers from the different academic areas who attend the class for a week to listen to the advance presentations of each student. The comments are focused on understanding how the design is linked to different variables and knowledge that they acquire in other courses, for example, structure, materiality, environment, among others.

Students continue to work on their projects and present their progress again on two separate occasions to external guests with different interests and/or professions (Figure 5). In the first presentation, the guests are people with physical disabilities and in the second they are people with sensory disabilities. The objective of these visits is for users to be able to comment with the students, from their own experience, on the difficulties or potentialities they find in each project. The guests we have received so far have been psychologists referred from the C.E.B.E. and part of the national para-sports tennis team. The guests also share their experiences and difficulties when traveling through our city through a fluid and unstructured conversation. It is not a participatory design since they do not intervene in the design process, but there is a joint reflection that gives rise to the improvements and adjustments of each project. These activities make the students gain more confidence about their project decisions.

People with physical disabilities give their opinion regarding the physical accessibility of the project. People with sensory disabilities, for their part, comment on how easy it is to be able to navigate in the different spaces considering the proposed reference elements. For example, podotactile floors and different textures that allow

Figure 5: Explanation of the progress of the project. Photo by author (2019).

tactile exploration to be able to orient oneself in space. The odours of the proposed vegetation serve as reference and guides to identify areas within the project. The smell of food can refer us to a dining room or kitchen, the smell of aromatic plants can refer us to an orchard or a garden, etc.

The important thing is that, throughout the course, students have a realistic approach to their professional practice and have real and direct contact with users. This gives the different proposed projects greater consistency and support. This allows students to become aware of their role as designers.

6. INCLUSIVE COMMUNICATION OF THE ARCHITECTURAL PROJECT

The course tries to go one step further. We talk about inclusion and equity; we talk about all users being able to enjoy accessible architecture and we also talk about inclusive communication of the architectural project. What are the tools that architects use to show and explain a project to a client? What if your client is someone who won't be able to see your printed plans and PowerPoint presentations? What if you are designing for a child? Is the user involved in the design process? With what tools?

The course not only works with traditional tools, such as drawn plans (either by hand or computer) and cardboard or balsa wood models. The students learn to work with haptic planes, planes with reliefs and different textures where each one represents different areas of the project. These plans are drawn up for each level of the

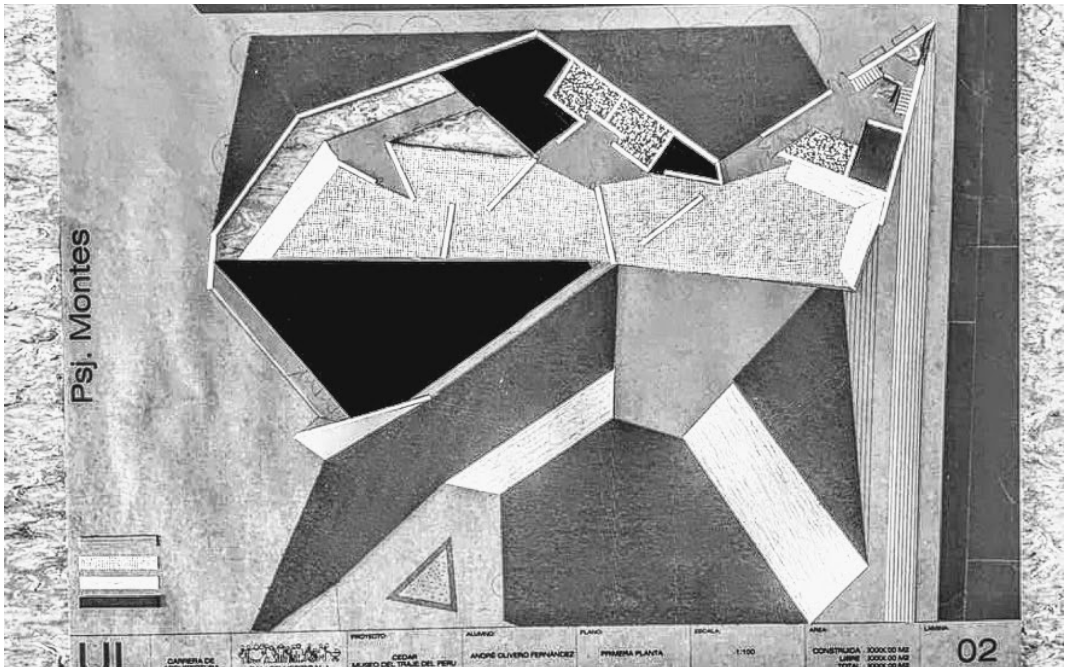

Figure 6: Haptic plan by student Valeria Lissa. Photo by author (2020).

project and in the process, progress is shown to people with total visual impairment or low sight in order to verify if the information is being transmitted correctly.

The reliefs serve to indicate where there are walls or partitions or to locate objects that do not allow circulation to flow.

Each plan has a legend that indicates the areas of the project. This legend is also worked in braille. Students learn to use digital fabrication technology to achieve inclusive communication of the architectural project. The University of Lima has a Fabrication Lab on campus to which students have access. There they learn to use 3D printers, laser cutters and CNC routers with the support of technical staff. 3D printing is used quite a bit in the course to make models that are more resistant to tactile exploration. The pieces are made of laser-cut cardboard that allows the student to visualise the project and make modifications in the process. The final pieces printed in 3D are shown to people with low sight and total visual impairment who carry out tactile exploration and, together with the haptic plans with legends in braille, manage to understand the architectural project from the development stage.

Students also prepare brief descriptive reports of the project printed in braille. All this information constitutes the delivery of the architectural project on the subject. This is the information that the invited jurors review during the development of the project and the final delivery.

The students understand that their responsibility as architects is not only the good design of accessible spaces that allow all users to have different spatial experiences - it is that they can be perceived by the different senses - but also to correctly

communicate the development of the project to whoever will use it. Therefore, the students prepare for 16 weeks to achieve an architectural project that is accessible in all parts of the process. A project that is designed for people from start to finish.

7. FINAL REMARKS

There are 16 weeks of continuous learning, awareness, and understanding of what it means to be an architect, but above all, of contact with people. We often see the training of architects taking place within the confines of the school, without exposing students to the real world, without real contact with users. We often see that the first time many young architects will face users is at the end of their studies with the first professional architectural commission. Shouldn't we learn to interact with these users from the outset, starting in undergraduate training? Shouldn't we encourage empathy and inclusion in our students? With what values do we train our students? Do we explicitly educate our students on values like that?

The course ends after 16 weeks with the delivery of the final grade. At this point, we make one more visit, probably the most significant of all. We visit again the children of the C.E.B.E. San Francisco de Asís in their school, only this time the architecture students bring their models and haptic plans made for the course, and share their projects with the C.E.B.E. students (Figure 7). For many of these children at C.E.B.E., this is the first time someone talks to them about architecture. It is the first time for all of them to follow a presentation explaining the story of an architectural project. For architecture students this presentation is different. This presentation is, symbolically speaking, a commitment. A commitment from future architects to the future generation of users of our city for thinking and making an architecture that is inclusive and accessible. Architecture for all.

What is noteworthy about this experience is that all the students attend this last meeting after being given their grades. None is missing.

With the passing of time, more and more people have joined this experience. I believe that it also shows the sensitivity that is achieved in students to be able to approach people and try to really understand their needs and different characteristics, which can result in inclusive design strategies and even provide crucial guidelines for their architectural proposals.

The learning and work of an architect goes through the complexity of sensory experience, and little by little, forms are restored, procedures are adjusted, in an almost endless process. And perhaps, in this whole process it is necessary to start with an elementary experience: 'open your eyes'. Open your eyes to the world and to inherited knowledge so that each one of us, with our own identity, can propose new ways, new 'forms' of establishing an open and fruitful dialogue with the medium that is architecture (Juarez 2011: 33).

Figure 7. Explanation of the final project to a girl with total visual impairment. Photo by author (2019).

JR. CAJAMARCA
JR. CASTANETA

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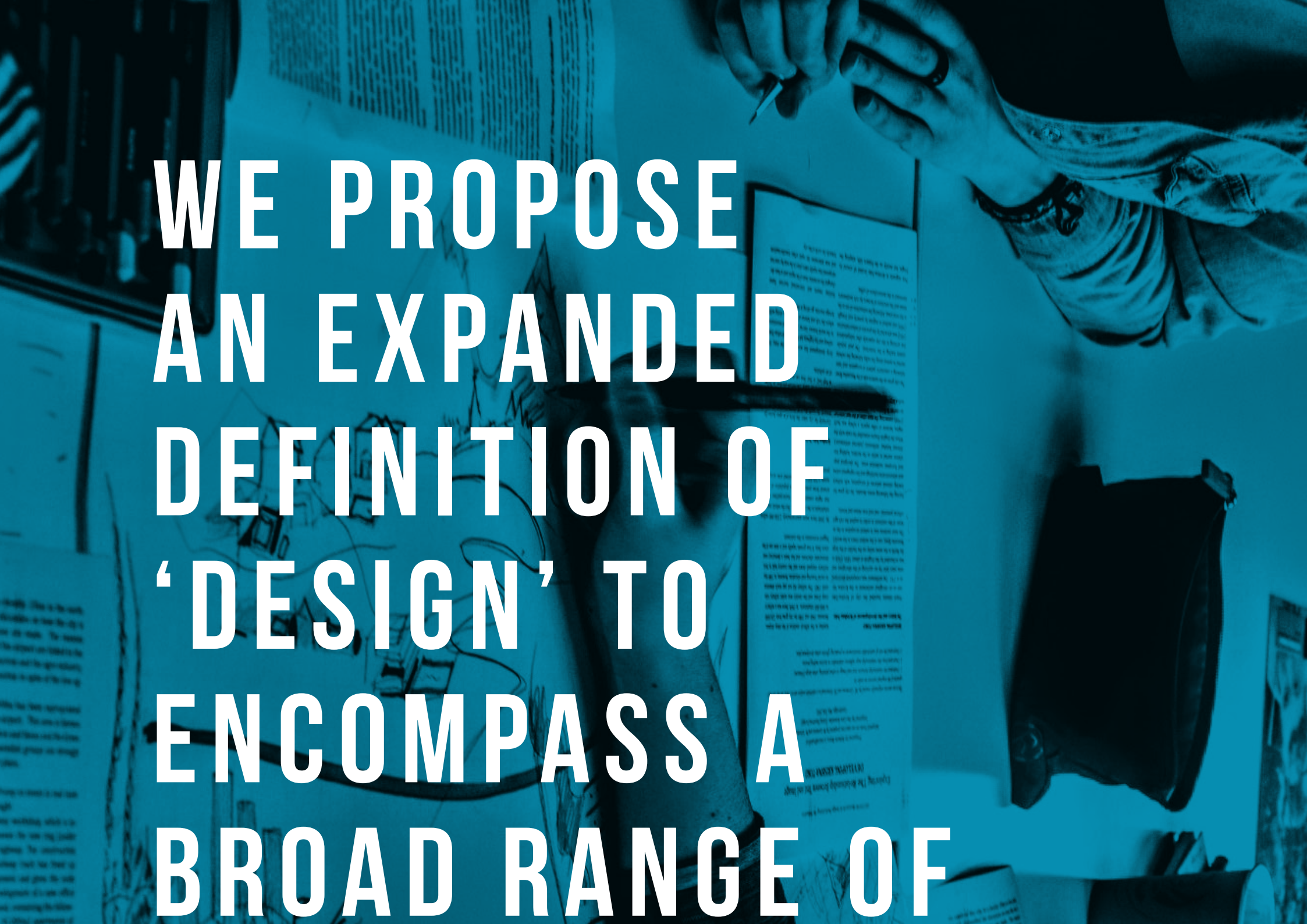

WE PROPOSE AN EXPANDED DEFINITION OF ‘DESIGN’ TO ENCOMPASS A BROAD RANGE OF

DISCIPLINES AND PROCESSES THAT ARE 'FUTURE-IMAGINIG' AND 'FUTURE- BUILDING'.

TU Delft students at work. Photo by R. Rocco

TEACHING DESIGN FOR VALUES
CONCEPTS, TOOLS & PRACTICES

The process of identifying, interpreting, and implementing societal values in university education is an essential part of responsible innovation and designing for equitable, inclusive, and sustainable societies. While there is now a well-defined and growing body of research on the theory and application of designing for values (or 'value sensitive design'), at present the pedagogical dimension remains underexplored. Teaching Design for Values: A Companion is a resource for teachers of design-based disciplines who wish to foreground values more explicitly in their classes. With fourteen chapters written by both TU Delft educators and international contributors, the book aims to examine the concepts, methods and experiences of teaching design for values within a variety of fields, including urbanism, engineering, architecture, artificial intelligence and industrial design. Through its multi-disciplinarity, Teaching Design for Values proposes an expanded definition of 'design' to encompass a broad range of disciplines and processes that deal generally with 'future-imagining' and 'future-building', including process management. In doing so it explores the ways that values may be expressed and analysed in a variety of different pedagogical contexts.

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