The Impact of the Socio-Cultural Context on Design Thinking Education

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Doctoral Dissertation
Berlin, 2021

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Doctoral dissertation

Submitted for the Degree of Doctor of Political Science
(Dr. rer. pol.) at the faculty of Economics and Social Sciences,
Potsdam University, Germany

Date of disputation: 22.02.2022

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Published online on the
Publication Server of the University of Potsdam:
https://doi.org/10.25932/publishup-54259
https://nbn-resolving.org/urn:nbn:de:kobv:517-opus4-542599

To my dad who could never finish his PhD due to financial hardship. Who used to jokingly say: “I wish for my kids to get a higher degree than I did!”
This is for you Baba.

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1 Introduction

Design Thinking (DT), a human-centered approach to collaborative problem-solving (Brown, 2008b), has gained significant attention across different fields including education (e.g. Koh et al., 2015; Kurokawa, 2013), business (e.g. Liedtka, 2018; Micheli & Perks, 2015), healthcare (e.g. Altman et al., 2018), as well as governance and policy making (e.g. Lewis et al., 2020; Mintrom & Luetjens, 2016). Success stories of the application of DT have been featured in numerous publications and press, such as Harvard Business Review (e.g. Liedtka, 2018b), Forbes (e.g. Higgins, 2020), and Fast Company (e.g. Neal, 2019). Today, many view DT as a path towards developing 21st century skills such as critical thinking, problem-solving and collaboration (Koh et al., 2015; Luka, 2014; Mosely et al., 2018; Noel & Liu, 2016; Noweski et al., 2012; von Thienen et al., 2017). As a result, teaching and learning DT has gained popularity (Withell & Haigh, 2013) and the number of higher education programs teaching DT to non-designers has been growing rapidly (Matthews & Wrigley, 2017). Courses on DT can be found in an array of disciplines such as engineering, business, and communication (Donar, 2011) and they may range from stand-alone programs on DT to courses that are

integrated in already existing curricula, with durations spanning from half-day workshops to semester-long courses.

The Hasso Plattner Institute of Design at Stanford, commonly referred to as the "d.school", is considered the educational origin of DT (Wrigley & Straker, 2017). Since its founding in 2005, students from different faculties at Stanford University have been learning the methodology by applying it to real-life projects (Jobst et al., 2012). DT is often taught in a learning-by-doing approach (Lindberg et al., 2011), where learners engage in hands-on activities and acquire DT capabilities through practice (Howard, 2012). Fast-paced learning activities that nudge learners towards experimenting rather than discussing have become synonymous with DT courses (see. Utley et al., n.d.).

With the spread of the success stories from d.school such as the Embrace Infant Warmer (Kelley & Kelley, 2013b) and LinkedIn Pulse (Rhinow, 2015), many educational institutes around the world began teaching DT (e.g. Delft University of Technology; Aalto University; Communication University of China; D.School Universidad Mayor in Santiago de Chile). Some of these new programs are developed in collaboration with already established institutions, which would send educators to help set-up new courses (e.g. Hasso Plattner Institute, 2019). Considering the increasing global uptake in teaching DT, the question that arises is: How is DT education - a practice originating in Silicon Valley - adapted to different cultural contexts?

This research aims to investigate the impact of the socio-cultural context on DT education. Following a qualitative approach, I conducted in-depth interviews with 22 educators at two schools teaching DT in Cape Town, South Africa and Kuala Lumpur, Malaysia. The goal was to understand the local educator's perspectives and to learn how they created learning experiences that resonated with their audience, in order to create a model of DT education that accounts for adaptations to the socio-cultural context. From this, I created a set of recommendations for future DT course designers.

1.1 Relevance

Exploring how DT education is adapted to the socio-cultural context it serves is increasingly urgent, considering the dissemination of DT and its pedagogical approaches

around the globe. The result will help educators and practitioners – local and international – to think critically about their practices and help them create learning experiences that meet the needs of the diverse global audience.

The importance of the influence of the cultural context on DT education becomes evident considering that on one hand, research in cross-cultural design suggests that methods may not have the same effectiveness everywhere (e.g. Chavan, 2005; Lee & Lee, 2007), on the other hand, research shows that education models developed in one context are not trivially applicable to other contexts without adaptation (e.g. Altinyelken, 2010; Frambach et al., 2012). Some scholars have specifically questioned the popularity of transferring Western educational approaches to other contexts (Bleakley et al., 2008; Nguyen et al., 2009).

Although there are many stories about the application of DT in different countries[1], the act of teaching DT itself and how it is adapted to different cultures have received less attention from both academia and the popular press. Most of the scholarly work on the intersection of DT and culture has looked at the adaptation of DT in organizations across different countries (e.g. Dribbisch, 2017; Ge & Maisch, 2016; Thao, 2016). Moreover, the literature on DT education mostly focuses on the Western schools (e.g. Jobst et al., 2012; Matthews & Wrigley, 2017; Noweski et al., 2012; Rauth et al., 2010), and those who studied non-Western programs do not discuss local adaptations (e.g. Koh et al., 2015; Kurokawa, 2013).

The rapid uptake in DT education has left practitioners and educators to experiment with teaching approaches long before academics could theorize about them. An in-depth understanding of how DT is taught in different contexts will elicit some of the teaching practices and approaches that are relevant for DT education in general.

Finally, this work adds a new perspective to knowledge on DT education as it draws insights and builds theory from non-Western case studies. While research in education and culture often deals with non-Western contexts as targets for analysis using frameworks that have been developed in the West (e.g. Niehoff et al., 2001; Pruett et al., 2009), this research takes a qualitative approach to learn from local educators' experiences.

[1] See https://thisisdesignthinking.net for more case studies on the application of DT.

1.2 Research Questions

My goal is to learn from the experiences of local educators and shed light on those practices and strategies that they – purposefully or unconsciously – apply to teach DT in a way that is meaningful for their audience. I aim to develop a model based on the research findings to help educators create DT learning experiences that resonate with the context they serve.

The questions underlying this research are:

- How is DT being taught in different contexts?
- What are the strategies and practices that educators apply to adapt DT education to their context?
- What are the implications for future course design?

1.3 Motivations

The motivation for this dissertation derived from three sources: My personal background, professional interest, and the gap in literature.

Throughout my higher education in Tehran, Berlin, Havana and Istanbul, I experienced a wide array of different and at times, clashing educational models. Often, there was a mismatch between how I was socialized to learn, and what was expected of me. Although confusing and uncomfortable at times, these experiences sparked my curiosity about the potential impact of the socio-cultural context on education in general.

As I began teaching DT internationally, I came to recognize the similar look of confusion and discomfort in some of my students' eyes. I began to question the efficacy of some of the approaches and methods that were commonplace in DT education and became curious to learn how I could better adapt them to my student's needs.

Finally, the gap in academic research on the intersection of DT education and the socio-cultural context which is discussed in length in Chapter 2 motivated me to explore this topic.

1.4 Outline

Chapter 2 contains a review of the relevant literature including topics such as DT education and culture. Chapter 3 describes the research design and the methodology that guided this study. The chapter includes sections on the two case studies, data collection and analysis, as well as strengths and limitations. Chapter 4 presents the research findings. It describes how DT was taught in the two cases and the adaptation practices that the local educators applied, using their own words. Chapter 5 includes a discussion of the findings and presents the model developed as a result of this research. In addition, it contains a set of recommendations for educators and practitioners. The final chapter presents the conclusions, highlights the contributions of the study, and offers avenues for future research.

2 Literature Review

2.1 Design Thinking

The origin of DT can be traced back to Simon's (1996) work and their analysis of the nature of design (Kimbell, 2011). Simon (1996) viewed design as "the core of all professional training" and believed that "everyone designs who devises courses of action aimed at changing existing situations into preferred ones" (p.111). The term *Design Thinking* however, was used by Rowe (1987) for the first time in their book with the same title, in which they present case studies of designers at work. DT in Rowe's (1987) view is the "interior situational logic and the decision-making processes of designers in action, as well as the theoretical dimensions that both account for and inform this kind of understanding" (p.2).

The popularity of DT as we know today is often credited to the design firm IDEO and the Stanford d.school (Mosely et al., 2018). The success stories about the application of DT and its potential for innovation caught the attention of the business field (e.g. Ingle, 2013; Roger, 2009; Ursrey, 2014). Mosely et al. (2018) point out that although DT is not a recent phenomenon, it is "a new perspective being actively adopted in non-design fields"(p.178).

Kimbell (2011) identifies the following three categories of descriptions of DT in the literature: 1) as a general theory of design; 2) as a cognitive style; 3) as an organizational resource. Johansson-Sköldberg et al. (2013) put forth a detailed overview of different perspectives on DT and identifies two main streams of discourses: one rooted in the academic field of design – referred to as *designerly thinking* – and the second,

management-oriented discourses. Within the *designerly thinking* stream, they categorized the following five theoretical perspectives as highly scholarly and grounded in design research: 1) design as the creation of artefacts; 2) design as a reflexive practice; 3) design as a problem-solving activity; 4) design as a way of making sense of things; 5) design as creation of meaning.

On the contrary, Johansson-Sköldberg et al. (2013) describe DT in the management stream as "much younger" and "less thoughtful and robust". They claim that this stream is a "simplified version of *designerly thinking* or a way of describing a designer's methods that is integrated into an academic or practical management discourse" (p.123). They categorize the following discourses within the management stream: 1) DT as IDEO's way of working with innovation; 2) DT as a way to approach indeterminate organizational problems; 3) DT as part of management theory. They argue that although two of the management discourses are grounded in management research, the link between the management and design discourse is weak. Table 1 by Schmiedgen et al. (2015) provides an overview of these discourses.

Matthews & Wrigley (2017) identify three main perspectives on DT in literature:1) DT combines empathy, optimism, collaboration and integrative thinking to transform how organizations work; 2) DT adopts designers' abductive thinking in order to infer possible new worlds; 3) DT integrates desirability, technological feasibility and business viability in the problem-solving process (see Table 2).

There are various conceptualizations of DT in the literature (Carlgren et al., 2016; Kleinsmann et al., 2017). Johansson-Sköldberg et al. (2013) argue that looking for a universal meaning to DT is an "essentialist trap". Instead one should attend to "where and how the concept is used in different situations, both theoretical and practical" (p.132). A study by Schmiedgen et al. (2015) on DT practices in organizations shows how not only the perception of DT varies (e.g. viewing DT as a toolbox versus mindset), but also sheds light on different roles that DT takes in the reality of organizations, from a recruitment tool to a methodology that helps bring in the customers' voice.

Discourse streams	Originator	Discourse Character & Academic Perspective	Relation to Practice / Epistemology Core Concept	Audience
Management discourses	IDEO & other industry leaders	Showcase success cases → experiences, some connections to innovation research	How we do design thinking (Kelley & Littman, 2001, 2005) and how anyone can use it (Brown, 2008a; Tom Kelley & Kelley, 2013a)	Company managers (potential customers)
	Roger Martin (2007, 2009)	Use success cases to illustrate theory development → cognitive/ management science/ planning theories	How successful production companies use design thinking and how 'any' organization can do it.	Company managers & educators (academics, consultants)
	Boland & Collopy (2004)	Scholars apply their theoretical perspectives to the design area → different perspectives	Design thinking as analogy and alternative.	Academic researchers & educators
Design discourses of designerly thinking	Simon (1996)	Economic & Political science	Rationalism: The science of the artificial	Academic researchers & educators in the design field
	Schön (1983)	Philosophy & Music	Pragmatism: Reflection in action	
	Buchanan (1992) based on Rittel and Webber (1973)	Art history	Postmodernism: Wicked problems	
	Lawson (2006); Cross (2007, 2011)	Design & Architecture	Practice perspective: Designerly ways of knowing	
	Krippendorf (2006)	Philosophy & Semantics	Hermeneutics: Creating meaning	

Table 1: DT discourses according to Johansson-Sköldberg et al. (2013), adopted from Schmiedgen et al. (2015, p. 134)

Carlgren and colleagues' (2016) qualitative study on six large organizations applying DT identify five characteristic themes of DT: User focus, problem framing, visualization, diversity, and experimentation. The authors argue that their framework allows for the variety of DT's application in practice and suggest a framing of DT as both an idea and an enactment.

Approach	Author	Details	Examples
Design thinking includes: empathy, integrative thinking, optimism, and collaboration to transform the way a company develops products, processes and strategy	Brown (2008b)	Design thinking uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity.	Design thinking can transform the way a company develops products, processes and strategy
Design thinking uses the abductive thinking of designers, to actively look for new data points, challenges accepted explanations, and infer possible new worlds	Martin (2009)	Evidence showing that creative thinking in a business is required for success. Examples of companies such as Apple, IBM focusing on what occurred before and after design thinking was adopted.	Case studies of popular corporation's process and journey but lacks in clear instructional directions to modify business
Design thinking integrates human, business and technology factors in the problem identification-solving and design process.	Meinel & Leifer (2011)	Design thinking comprises human-centered methodology combining expertise from design, social sciences, engineering and business. It blends an end-user focus with multi-disciplinary collaboration and interactive improvements to produce intuitive products, systems and services.	Exploration of the design thinking process, by describing the development and application of design thinking

Table 2: Perspectives on DT, adopted from Matthews and Wrigley (2017, p. 43)

There are various representations of the DT process model (e.g. six bubbles, five hexagons). Despite the variations, the models often share three similar core phases, as Brown and Wyatt (2010) describe:

> The [DT] process is best thought of as a system of overlapping spaces rather than a sequence of orderly steps. There are three spaces to keep in mind: inspiration, ideation, and implementation. Think of inspiration as the problem or opportunity that motivates the search for solutions; ideation as the process of generating, developing, and testing ideas; and implementation as the path that leads from the project stage into people's lives. (p.33)

The term "space" emphasizes that there are no sequential steps (Brown & Wyatt, 2010). The process is not linear and navigating these spaces depends on the problem and its context (Brown, 2008b; Dorst & Cross, 2001). The process model that is referred to in this work mirrors the one used by IDEO and d.school at Stanford and is shown in Figure 1.

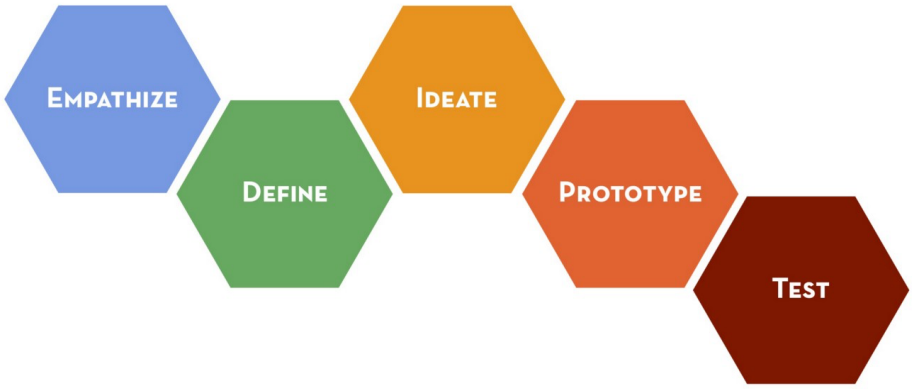

Figure 1: DT Process model of the d.school at Stanford (d.school Stanford, 2020)

- **Empathize**: Learning about people who are affected by the problem to understand their nascent needs.
- **Define**: Redefining the original problem from the user's perspective and based on the need that was uncovered.
- **Ideation**: Generating ideas for the new problem statement and selecting those that are deemed more relevant.
- **Prototyping**: Making ideas tangible and experienceable.
- **Testing**: The prototypes are tested with potential users and their feedback is noted to guide further iterations.

There are various methods that can be applied in each phase. Gray and Boling (2018) describe the aim of design methods to "support ways of thinking and acting, used by designers to work through a design process" (p.81). DT methods are drawn from different disciplines such as ethnography (e.g. semi-structured interviewing) and design (e.g. sketching, prototyping) (Rauth et al., 2010).

Finally, there are certain principles underlying the problem-solving process known as DT mindsets. DT mindsets are described as values that "shape the epistemological view and methodology for learning" (Rauth et al., 2010) and "vital attitudes for a design thinker to hold" (Both & Baggereor, 2010). Schweitzer et al. (2016) conducted interviews with experts and reviewed the literature and identified eleven DT mindsets, such as "preference for experimentation" and "openness to new perspectives". However, there are no universal number of DT mindsets and different organizations may promote different variations.

2.2 Design Thinking Education

DT has been viewed as a path towards developing 21st century skillsets such as critical thinking, problem-solving and collaboration (Koh et al., 2015; Mosely et al., 2018; Noel & Liu, 2016; Noweski et al., 2012; von Thienen et al., 2017). Rauth et al. (2010) describe DT in education as "a holistic concept to design cognition and design learning that enables students to work successfully in multi-disciplinary teams and enact positive, design-led change in the world" (p.2). Noel and Liub (2016) argue that teaching DT not only offers crucial skills in higher education but also can benefit children in primary and secondary levels. The popularity of DT is also reflected in the growing number of online courses on the topic (Taheri & Meinel, 2015).

The first two educational institutes teaching DT are the Hasso Plattner Institute of Design (d.school at Stanford), USA and Hasso Plattner School of Design Thinking (HPI D-School) in Potsdam, Germany (Wrigley & Straker, 2017). Rauth et al. (2010) describe the origin of these two institutes:

> To educate design thinking, so-called d.schools have been built in Stanford and Potsdam. The concept of the d.school was originally developed at Stanford and officially established in 2005. The self-proclaimed goal "d.manifesto" of the institution is to "create the best design school" and to prepare "future innovators to be breakthrough thinkers" using "design thinking to inspire multidisciplinary teams". Due to the request of the main sponsor, Hasso Plattner, a sister institute was opened in 2007 in Potsdam, Germany. Within the first years, both institutions worked with employees from the design consultancy IDEO to teach design thinking. (p.3)

The programs offered by these two schools vary in length, audience, and curricula (Rauth et al., 2010) . Teaching DT at Stanford University goes back before the founding of the d.school and to the 60s (Brenner et al., 2016), to the *Creative Engineering* seminars offered by John Arnold (see von Thienen et al., 2018).

In order to understand how DT is being taught to non-designers Wrigley and Straker (2017) conducted a review of 51 undergraduate level DT courses across 28 international universities. The result of their analysis is the Educational Design Ladder

that illustrates the pedagogical stages in the development of DT (Figure 2). Wrigley and Straker (2017) suggest that when students progress through these five steps (from lower to higher order thinking skills), they gain the skills and knowledge needed for applying DT effectively to different problems. They further claim that their model can guide educators to design a curriculum that facilitates the students' progress through these stages.

Beligatamulla et al. (2019) point out some of the shortcomings of the Educational Design Ladder, such as relying on secondary data sources (gathered from universities' websites and online publications) and implying a limited understanding of pedagogy, one which neglects educational theory and philosophy. Beligatamulla et al. (2019) on the other hand, conducted in-depth interviews with three experienced DT educators in order to "make sense of the experience of DT pedagogy". Their analysis led to identifying one super-ordinate theme of *capability building for everyone*, and four sub-ordinate themes of *developing an open explorative attitude*, *a creative ability*, *an ethical mindset*, and *a participatory approach towards world issues*.

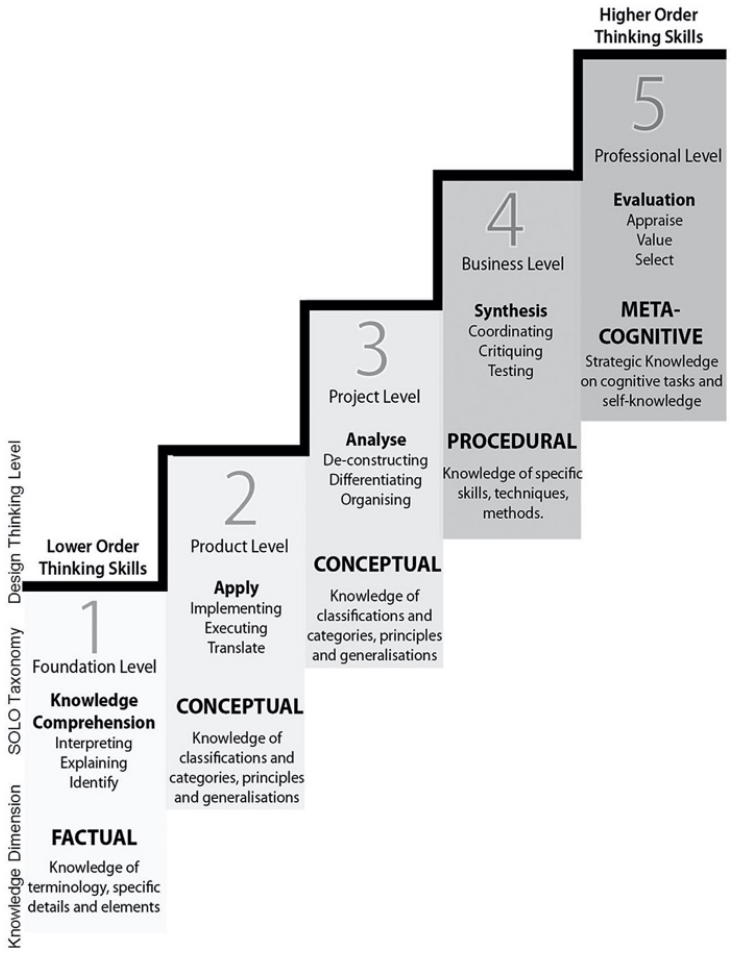

Figure 2: Educational Design Ladder Pedagogy by Wrigley and Straker (2017)

Matthews and Wrigley (2017) investigated how DT is taught in business and management education around the world. They identified the four following categories of programs. Note that all the programs mentioned and studied are in Western countries.

1) Human-centered design (HCD): This category of courses are the most common and well-known, due to being pioneered by IDEO and Stanford d.school. The focus of this approach is on people's needs. Innovation is seen as a result of intersection between desirability, feasibility, and viability. These programs adopt an iterative and non-linear process model that includes exploring user need around a given problem, reframing the problem from user's perspective, generating ideas, building prototypes and testing. Some of the institutes following this approach include University of St. Gallen, Aalto University, HPI d-school.

2) Integrative Thinking: This category follows Roger Martin's school of thought and combines DT with decision making. The only program mentioned in this category is the Rotman School of Management at University of Toronto, where Martin is the dean. Martin (2007) describes Integrative Thinking as:

> …the ability to constructively face the tensions of opposing models, and instead of choosing one at the expense of the other, generating a creative resolution of the tension in the form of a new model that contains elements of the individual models, but superior to each (p.15).

The process includes the following four steps: *Salient*, where the team decides what aspects of the problem to pay attention to; *Causality*, where the team maps the relations between different puzzle pieces; *Architecture*, an overall mental model based on the first two steps is constructed; *Resolution*, where the team searches for creative resolutions.

3) Design Management: This category of programs follows the Design Management approach by Borja de Mozota (2006) which is based on researching design-oriented small and medium enterprises in Europe (SMEs). Here, design can be understood in the following ways:

- Design can be a differentiator, as a source of competitive advantage.

- Design can be an integrator, as a resource that improves new product development and innovation processes.
- Design can be a transformer, as a resource for creating new business opportunities.
- Good design leads to good business (e.g. greater market share, increased sales).

Programs identified in this category include Politecnico di Milano, Lancaster Institute for the Contemporary Arts, and California College of the Arts

4) Design as strategy: Programs of this category combine HCD with components of strategy with the aim of creating sustainable competitive advantage for organizations. These programs are often offered as executive education workshops in partnership with companies.

DT courses bring students from different disciplines together to work on real-world projects (Matthews & Wrigley, 2017) often called *design challenges*. DT is often taught through hands-on activities where individuals acquire DT capabilities through practice (Howard, 2012). In describing DT courses, von Thienen et al. (2018) write: "The 'look and feel' of formal school or university education is strictly avoided. Frontal lectures are short and rare (Kelley & Kelley, 2013; Roth, 2015). Theories are usually not mentioned at all" (p.37).

To understand DT education's goal and how educators support students towards it, Rauth et al. (2010) conducted 17 semi-structured interviews with educators at the d.school at Stanford, and HPI d-school in Potsdam. As a result of their analysis they define DT as "a learning model which supports design creativity, utilizing a project and process based learning process by emphasizing creative confidence and competence" (p.7). Mosely et al. (2018) report that one of the significant challenges in teaching DT to non-design students is "shifting students mindsets from traditional thinking approach to a design thinking approach" (p.184). In fact, change in mindset is one of the desired learning objectives of DT education (Taheri et al., 2016).

DT educators – often referred to as facilitators or coaches – play an important role in the learning experience. A number of scholars have highlighted the crucial role of facilitators in the problem-solving process, whether in educational settings or organizational projects (Aguirre et al., 2017; Beckman & Barry, 2007; Body et al., 2010;

Golsby-Smith, 2007; Liedtka, 2018a; Luck, 2007; Mosely et al., 2018; Wright & Wrigley, 2019). Mosely et al. (2018) describe the main role of the DT facilitator to "enable dialogue and ideas to develop in relation to a problem and solution. Facilitating involves assisting team members to collaboratively approach problems in new ways and creatively generate novel and appropriate ideas" (p.180). Body et al. (2010) writes that "a design facilitator takes a group through a collaborative process of design thinking to create a picture of a future state that doesn't yet exist and one which is better from the perspective of the multiple stakeholders and point of views"(p.65). In an exploratory study of organizations that apply DT, Liedtka (2018a) reports that facilitation was built into many of the successful programs which led to a better quality of output and helped with building confidence, especially with novices. Johnson (2016) writes: "Those who facilitate design learning must steadfastly negotiate their own fears as they lead others into equilibrium, uncertainty and radical reframing that reliably occurs when designing" (p.129).

DT is a relatively new field and some of its concepts are based on practice and widely referenced and taught, but not yet established in research. Nevertheless, they are still important to acknowledge and worthwhile to examine. One of such concepts is the *Three P model of DT*: "The core elements of HPI's Design Thinking mindset are multidisciplinary teams (people), variable space (place) and the Design Thinking process." (D-school website). Professor Ulrich Weinberg, head of the HPI D-school, has emphasized "People, Process, and Place" as the core elements of DT in several talks and interviews (e.g. Baker, 2019; IEDP Editorial, 2015).

Outside of the DT education realm, SAP, one of the pioneering organizations in adopting DT, also refers to the *Three P*'s: "SAP made strategic efforts to implement the exploring and testing mindset of Design Thinking. Their core initiative covers the so-called three P's: People, Process and Place. People means making sure you are working in an interdisciplinary environment. Process means having a conscious knowledge on which methods to use when and being able to switch between methods taken from Design Thinking as well as Agile Development processes" (Jensen et al., 2016).

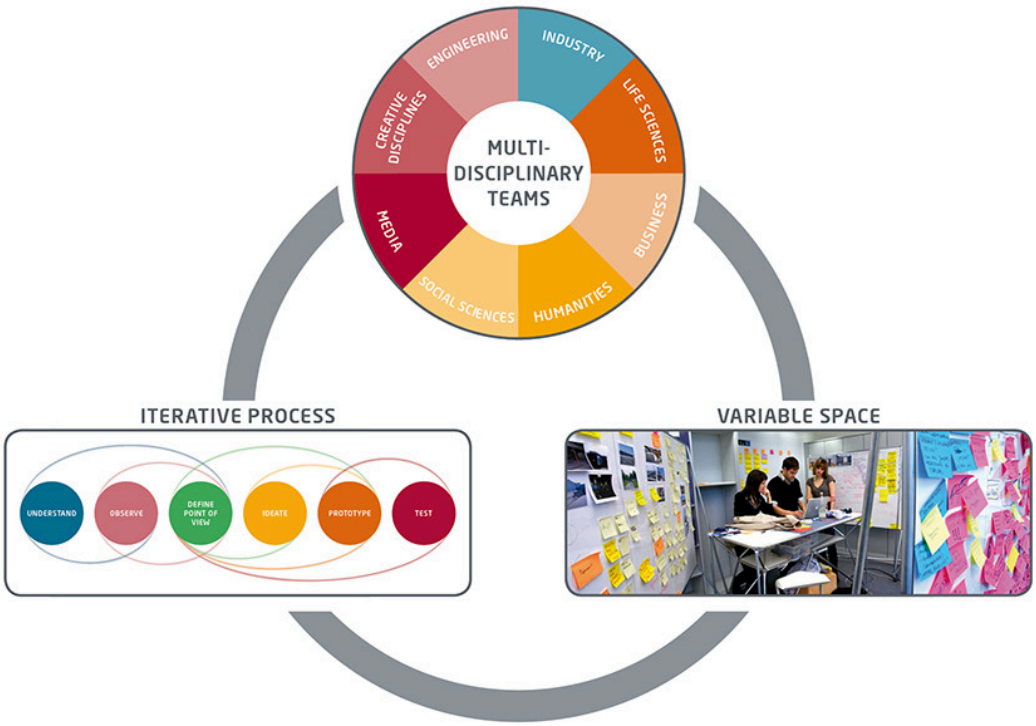

Figure 3: The Three P model, taken from the HPI d-school (2021)

Von Thienen et al. (2017) state: "design thinking work culture builds on three pillars. They are called '3Ps', standing for process, place and people." (p.308). In their paper titled "People, Place, Process: Lessons learnt on the path to a d.school", Hillen and Levy (2013) present their longitudinal study of developing DT courses for the d.school in Paris. They draw learnings from observing multiple DT courses and offer recommendations and key insights for developing DT programs. They explain that "setting up DT courses and programs imply to tackle three areas of concern: People, Place, Process" or as they call it, the *PPP Framework*. They suggest that this framework "may be an efficient tool to guide DT faculty" in developing their courses.

Later on, in their doctoral thesis, Hillen elaborates on the foundation of their *PPP Framework*, writing: "It is built on the metaphor of exploration. In the 15th century, the so-called age of discovery, would-be explorers needed to be careful and thorough in their attention to three key elements: A crew (people), a boat (place) and navigation tools (process and tools)" (p.80). In their framework, *People* refers to the members of the project team that come from different disciplines, *Place* is where innovation takes place, and finally the *Process* refers to DT phases and different tools and methods related to them (Hillen, 2016).

Whether called Three P Model or PPP Framework, the core ideas are the same: *Process* refers to the DT's iterative problem-solving process with its various phases, methods and mindsets, *Place* refers to dedicated physical spaces that are designed to support teamwork and different DT activities, and *People* refers to multidisciplinary project teams (von Thienen et al., 2017).

2.3 Culture

Scholars from different fields have been trying to define culture for long, yet there is no consensus on what it entails. Definitions of culture varies from more rigid views of culture as "the collective programming of the mind which distinguishes the members of one group or category of people from another" (Hofstede, 1991, p. 5) to more dynamic conceptualizations that view culture "in the interaction between actors, not *within* actors." (Langstedt, 2018).

Several scholars attempted to constrain culture into measurable, predictable and comparable dimensions. The hallmarks of these efforts are the widely cited frameworks of Hofstede's (2001) model of cultural differences (5 cultural dimensions), Trompenaars and Hampden-Turner's model (1997) (7 cultural dimensions) and the GLOBE study by House and colleagues (2004) (9 cultural dimensions). Table 3 provides an overview of these models and their dimensions.

Hofstede	Trompenaars and Hampden-Turner	House et al. (GLOBE studies)
1. Uncertainty avoidance	1. Universalism v. particularism	1. Uncertainty avoidance
2. Individualism v. collectivism	2. Individualism v. collectivism	2. Collectivism I: institutional collectivism
3. Masculinity v. femininity	3. Neutral v. affective relationships	3. Collectivism II: in-group collectivism
4. Power distance	4. Achievement v. ascription (doing/being)	4. Assertiveness
5. Long v. short term orientation	5. Specific v. diffuse relationships	5. Power distance
	6. Inner v. outer directed	6. Future orientation
	7. Sequential v. synchronic time	7. Gender egalitarianism
		8. Performance orientation
		9. Humane orientation

Table 3: Overview of the three popular cultural models, derived from Nathan (2015).

Despite their popularity, numerous scholars across different fields have criticized these positivist approaches to culture (e.g. Holliday, 2012; McSweeney, 2016; Nathan, 2015; Signorini et al., 2009; Walsham, 2002). McSweeney (2016) refers to these three cultural models as "the Trio", explaining that despite their conflicts at times (e.g. Hampden-Turner & Trompenaars, 1997) they all share similar views on national culture as: 1) values, defined as invariant transitional preferences; 2) universally shared by the population of a country; 3) coherent; 4) the fundamental cause of behavior and artefacts; 5) stable; 6) identifiable from the mean scores of answers to self-response survey of a small sample of a national population; 7) depictable as dimensions.

Chapman (1996) describes how the positivist paradigms that dominated the fields of anthropology and sociology in the mid-twentieth century led to the development of such "essentialist" conceptualizations of culture, like Hofstede's model. As Nathan (2015) explains, "the paradigm of 5-7-9 cultural dimensions" are essentialist since they dismiss "variation and change of human conditions" in their view of culture. McSweeney (2016) argues that "perhaps the most influential, attraction of *the Trio*'s depictions of culture is the breathtaking claim that it shapes the social action of defined populations enduringly and predictably."

Perhaps the most popular of these models is Hofstede's work, which has been widely used in different fields such as business, management, and education (Signorini et al., 2009). Apart from the "the collective programming of the mind" (Hofstede, 1991) later on, Hofstede and Hofstede suggest a notion of "layers of culture" explaining that "every group or category of people carries a set of common mental programs that constitutes its culture" (Hofstede et al., 2010, p. 17). Inherent to Hofstede's definition of culture is a static view that overlooks the "fuzziness" and complexity which is innate to culture (Signorini et al., 2009). Some argue that the sample of the study – IBM employees in the 80s and thus, predominantly middle-class male – was not and is not representative of the diversity in the countries studied (Fougère & Moulettes, 2007; McSweeney, 2002). Søndergaard (1994) argues that Hofstede's work deems important not necessarily due to its accuracy, but because of its ease of replication and popularity. Discussing all the critiques of these three models is beyond the scope of this work. In the following I list some of the limitations pointed out by various scholars:

1. Essentialist view of culture that "ignores agency and identity" of individuals (Nathan, 2015).
2. Bipolar dimensions of culture (McSweeney, 2002).
3. National culture as a "static monolith" (Langstedt, 2018) that dismisses within-country variations (Holliday, 2000; McSweeney, 2016; Nathan, 2015). Using scores to depict national cultures, implies that national cultures are homogenous (Walsham, 2002).
4. "Cultures do not equate with nations" (Baskerville, 2003). McSweeney (2016) explains the risk of such view, writing:

> Of course, there are some national uniformities, for instance, most cars are driven on the right-hand side of the road in Brazil; in India many drive on the left-hand side – because of legal requirements, a legacy of British colonial rule. The claim that national uniformities are a consequence of 'national culture' is a mere assertion that ignores other possible explanations.

5. Confining culture to geographical borders ignores the drastic social and political changes that countries experience (Nathan, 2015). Ali et al. (2008) highlight that the idea of nation-state is a relatively new phenomenon in human history, writing "not only have the physical boundaries of many nation-states changed in recent years, but so has the ethnic and racial mix within them." (p.6)
6. Risk of stereotyping: McSweeney (2016) cautions that assuming that people from a specific country share "identical values/attitudes/dispositions is often called stereotyping in everyday parlance." Holliday (2012) explains how such views on culture can be misleading: "If a culture is deemed collectivist, 'any' behavior within it can be explained as contributing to (or as an exception to) its collectivism."

Taxonomic models of culture (e.g. Hofstede) have been utilized in education as well (Eldridge & Cranston, 2009; Gunawardena & Jung, 2015). In addition to some of the critiques mentioned above, Signorini et al. (2009) argue that drawing conclusions for education based on Hofstede's model is problematic, since the dimensions were drawn from the IBM employee pool – a non-educational setting. They suggest that instead of reducing culture to geographical borders, researchers in education should start "with

examining micro-cultures, for example, one particular learning setting in HE [higher education] in combination with an individual's relevant experiences" (p.262).

Hall's (1976) model of cultural communication, also known as *Contexting model* is another influential, yet essentialist cultural model (Cardon, 2008; Chuang, 2003). For Hall, communication and culture were inseparable: "Culture is communication and communication is culture" (Hall, 1959, p. 186). In their book "Beyond Culture", Hall (1976) introduces the *Contexting model* and explains two style of communications among cultures:

> A high-context [HC] communication or message is one in which most of the information is already in the person, while very little is in the coded, explicit, transmitted part of the message. A low-context [LC] communication is just the opposite, that is, the mass of the information is vested in the explicit code (p. 79).

In Hall's view, cultures are either primarily HC or primarily LC, suggesting a continuum from extremely LC to extremely HC cultures. They offered rankings among countries from lowest (e.g. Swiss-Germans, Germans, Scandinavians) to highest context (e.g. Latin Americans, Arabs, Japanese). Unlike the above-mentioned cultural models, Hall did not attempt to quantify cultural dimensions (McSweeney, 2016) and subscribed to cultural relativism, meaning that different aspects of any culture should be judged only in its own context (Rogers et al., 2002). Some argue that Hall's work on culture as an anthropologist has laid the foundation for the field of cross-cultural communication (Hart, 1999; Rogers & Steinfatt, 1999). However, Hall's work is not without criticism. Kittler et al. (2011) systematic literature review shows the popularity of Hall's *Contexting model* in intercultural studies, while pointing out three main critiques: its bipolar approach to culture, lack of solid empirical foundation, and overgeneralization. In fact, Hall's generalizations (e.g. "Arabs", "Latin Americans") have attracted a lot of criticism (McSweeney, 2016).

Chuang (2003) argues that most studies have treated LC/HC or individualism/collectivism as bipolar states, whereas these concepts should be treated as highly contextual and the nature of the investigated relationship should be considered, writing: "The communication differences may not be strictly related to cultural differences, but rather to personality, power imbalance, socialization of gender roles,

the distinction between in-group and out-group members, and the level of commitment in the relationships" (p.29).

Although the fields of sociology and anthropology have rejected essentialist conceptualizations of culture (Baskerville, 2003; Nathan, 2015), they are still popular in other fields. Langstedt (2018) criticizes the prevalence of views of culture that treat individuals as "passive subjects who act according to their cultural programming and are unable to adapt, learn, or modify their actions according to circumstances". Their research shows how essentialists views of culture among managers offer excuses for discrimination and exclusion based on cultural backgrounds.

The cultural models have been popular in the field of cross-cultural design as well. For instance, Hall's *Contexting model* alongside Hofstede's *power distance dimension* have been used in cross-cultural interface design (e.g. Ahmed et al., 2009; Xie et al., 2009). Van Boeijen (2013) uses "the Trio" models (McSweeney, 2016) to "typify cultures" in order to support designers in working across cultures. However, Jagne and Smith-Atakan (2006) warn designers to be careful not to stereotype their markets by using existing cultural models. In their ethnographic study of designers' practices across the world, Hinds and Lyon (2011) point out the prevalence of the use of cultural dimensions in most studies, despite their dismissal of individuals' social and institutional contexts. They on the other hand, advocate for a "nested view of culture [that] considers the context in which people are embedded as instrumental in understanding behavior" (p.102).

Miike (2002) argues that "one of the crucial limitations of culture and communication studies has been that almost all of the known research has been carried out by Western scholars or non-Western scholars trained in the Western paradigms" (p.16). Pointing out the long tradition in communication research that studies Asia through frameworks developed in the West, Miike (2002) advocates for theorizing about Asia from an Asiacentric perspective:

> Theoretical perspectives and research findings, whether intended or unintended, often have negative impacts on the researched community. They are also knowingly and unknowingly misapplied to misrepresent the theorized people. It is the role of Asiacentric communication critics to elaborate on how certain Eurocentric representations have come to do harm

> to Asians. If such representations foster stereotyping, for example, they ought to elucidate what kind of representation becomes a stereotype and why (p.42).

Taxonomic and essentialist views of culture have been especially criticized by scholars using a postcolonial lens (e.g. Holliday, 2012; Irani et al., 2010; Kwek, 2003). Kwek (2003) argues that although work of Hofstede ignited interest in culture among practitioners and theorists, "Hofstede's theorizations need to be understood as *cultural products* of a Eurocentric mindset… in the context of historical power-relationships that existed between East and West during colonialism, and that allowed the East to be *defined* by the West" (p.122). They argue that attempts to confine culture to predictable characteristics "perpetuate a colonizing process that seeks to homogenize, reduce, and silence other cultures" (p.124).

Holliday (2012) criticizes the static views of culture writing "the common age of cultures as national structures that define and confine us is an illusion forged by Western ideology both in the academy and in society more generally"(p.44). Holliday (2012) calls the popular cultural frameworks "methodological nationalism" rooted in nineteenth-century European nationalism, which offer "simplistic explanations that do not recognize the true complexity of culture in which boundaries are blurred and diversity is the norm" (p.39). Drawing from critical cosmopolitan paradigm, they point to a "classic example" of East Asian students' quietness in British classrooms, explaining that the dominant view of culture would refer to lack of self-determination in collectivist national cultures. While the critical cosmopolitan view, apart from educational practices and national traditions, looks for other possible explanations and tries to offer ways to improve overall practices in the classroom.

Irani et al. (2010) point to the recent views in anthropology and postcolonial studies that define culture as:

> A lens through which people collectively encounter the world … From this view, an individual may participate in many cultures – cultures of ethnicity, nationhood, profession, class, gender, kinship, and history – each of which, with its logics and narratives, frames the experience of everyday life (p.1313).

Benhabib (2018) rejects the notion of cultural homogeneity implied by popular cultural models and highlights the role of history:

> Any complex human society, at any point in time, is composed of multiple material and symbolic practices with a history. This history is the sedimented repository of struggles for power, symbolization, and signification – in short, for cultural and political hegemony carried out among groups, classes, and genders. There is never a single culture, one coherent system of beliefs, significations, symbolizations, and practices, that would extend across the full range of human activities (p.60).

Many scholars advocate for non-essentialists views of culture (e.g. Dahl, 2014; Holliday, 2000; Langstedt, 2018; Nathan, 2015). Langstedt (2018) writes: "The essentialist paradigm assumes culture to shape the agents, who further act as they are culturally 'programmed'. Non-essentialists, on the contrary, assume actors to create and shape culture through their actions". Holliday (2000) explains these two approaches to culture with an example of a classroom conflict between the students and teacher:

> An essentialist approach would be to begin with the notion that the teacher comes from one national culture and the students from another... a non-essentialist approach would *not* begin with the notion that the teacher comes from one national culture and the students from another. Instead, one would look at the classroom as a small culture and explore how the dynamics of its culture lead to conflict (p.39-40).

As Langstedt (2018) explains, adopting a non-essentialist view of culture does not imply that there are no cultural differences, rather the differences are seen as "situational factors that affect actions" rather than "dispositional causes that control agents."

Many in the field of sociology and psychology have moved away from essentialist approaches to culture and are advocating for more nuanced views that emphasize the role of social processes (Dimaggio & Markus, 2010). Hamedani and Markus (2019) write that "cultures are always dynamic, never static, and can change and evolve over time." Morris et al. (2015) describe culture as "a loosely integrated system of ideas, practices, and social institutions that enable coordination of behavior in a population" (p. 632).

Adams and Markus (2004) reject what they call "entity" views on culture – that define culture as static beliefs of members of a collective – for a more dynamic construct:

> Culture consists of explicit and implicit *patterns* of historically-derived and selected ideas and their embodiment in institutions, practices, and artefacts; cultural patterns may, on one hand, be considered as products of action, and on the other as conditioning elements of further action (p. 341).

This approach recognizes that "individuals are not separate from their social context and that social contexts do not exist apart from people" (Dimaggio & Markus, 2010, p. 348). Hong and Mallorie (2004) suggest a dynamic constructivist approach to culture that rely on two grounds: "First, culture is conceptualized not as a general, monolithic entity, but as a loose network of domain-specific cognitive structures... Second, an individual can hold more than one cultural meaning system, even if the systems contain conflicting theories" (p. 63).

2.4 Definition of Culture for This Work

This work explores the practices and strategies of DT educators through a socio-cultural lens. Socio-cultural theories were developed by the Soviet psychologist Lev Vygotsky in the early 1900s (Nasir & Hand, 2006; Vásquez, 2006). In this view, culture is "not only a system of meaning carried across generations, but also as constantly being created and recreated in local contexts" (Nasir & Hand, 2006, p. 456) and the human condition is influenced by both cultural as well as social processes (Vásquez, 2006). Socio-cultural theorists believe that "individuals continuously internalize their social, cultural, and contextual surroundings, while at the same time influencing their surrounding by externalizing their inner values and beliefs (Engeström & Miettinen, 1999)" (Frambach et al., 2013, p. 3). In other words, the lines between nation, culture, language, and other arbitrary attributes are blurry (Vásquez, 2006).

I subscribe to the non-essentialist views of culture. Like scholars such as Irani et al. (2010) and Nasir and Hand (2006), I view culture as both performed and generated by those involved, and acknowledge that at any time, individuals are members of various cultures that are in flux.

Holliday (2012) points out the global inequality in how cultural differences have been viewed in both academia and society, resulting in "sustained and profound cultural disbelief with regard to an imagined non-Western Other." They suggest that research on education and culture should focus on "cultural 'belief' rather than disbelief" and instead of a deficit view, attend to "what the cultural Other 'can' do and contribute". Following their advice, my goal in this research was to learn about how DT education is adapted in different socio-cultural contexts from the local educators' perspectives, instead of using ordained conceptualizations of culture.

2.5 Culture and Design Thinking Education

Most of the scholarly work on the intersection of DT and culture have looked at the adaptation of DT in organizations in different countries (e.g. Dribbisch, 2017; Ge & Maisch, 2016; Thao, 2016). Despite the sharp rise in demand for teaching and learning DT, the research on the adaptation of DT education to different cultural contexts is scarce.

Lee and Yuan (2018) report on their experience of teaching DT in ShanghaiTech University in China and the evolution of their course from teaching what they call, the "Stanford d.school's standard syllabus" to a course that was better suited for their students. They placed critical thinking at the core of their iterated course, since it is a crucial skill in DT and was lacking from the students' prior education. They also adapted their pedagogical approach, allowing the "students to engage with pedagogy familiar to them while slowly introducing and guiding them through the more experiential self-directed segments of the course" (p.102).

In their article advocating for a culturally-sensitive design education, van Boeijen et al. (2017) point out that while design methods and tools that account for cultural context of intended users exist, dedicated techniques that "address cultural sensitivity *in the process of education* are rare". They report on their experience developing design courses for two schools in China. To assure that the courses were culturally sensitive, they worked closely with teachers at the host universities, having several preparatory meetings and getting their feedback throughout the course. Different aspects of the course such as formulating the design briefs and forming teams were carried out

together with the hosting teachers. In addition, van Boeijen and colleagues write about the importance of being aware of the "social hidden rules":

> For example, giggling behavior may be experienced by some teachers as not taking the situation seriously, whereas by others it is experienced as being engaged and enjoying the process. A non-judgmental, open mind, with a genuine curiosity for other cultural values is therefore a prerequisite for creating engagement (p.648).

In "The Impact of Cultural Differences in Design Thinking Education", Thoring et al. (2014) compare a set of criteria they deem important for DT with Hofstede's model and offer a framework to help educators and practitioners navigate possible complications in DT projects in international settings. Apart from the limitations of using taxonomic models of culture that were mentioned before, the underlying assumption that "team members from specific cultures and nationalities might have difficulties to cope with specific mindsets of design thinking" is problematic on two fronts: First, it dismisses the fact that DT education itself is a product of the context of its origin – Silicon Valley – and thus its methods, mindsets and pedagogy might be less effective in other contexts. It attributes some sort of universality to DT education, a one-size-fits-all that requires others to adjust to it. Second, it overlooks the role of educators in adapting their teaching to suit the context they wish to serve.

Koh et al. (2015) present several cases of DT in classrooms in Singapore and Taiwan. However, their work does not mention any adaptation practices. Chon and Sim (2019) also report on teaching DT at undergraduate level in Singapore. They write about the success of the pilot study, with no discussions about if and how different aspects such as pedagogy or methods were adapted to the needs of their context.

3 Research Design

This chapter presents the methodology, data collection and analysis, strengths and limitations of this research. As a first step, it is important to discuss my philosophical stance as a researcher (Birks & Mills, 2015). Crotty (1998) suggests the four following elements of the research design process: Epistemology, theoretical perspective, methodology and methods. These elements are interrelated, meaning that the researcher's epistemology and theoretical stance influence their choice of methodology and methods. Epistemology is "a way of understanding and explaining how we know what we know" (Crotty, 1998, p. 3). I subscribe to constructivist epistemology which views knowledge and reality as socially constructed through interactions between people (Charmaz, 2014). Constructivism argues that "truth and meaning do not exist in some external world, but are created by the subject's interactions with the world. Meaning is constructed not discovered, so subjects construct their own meaning in different ways, even in relation to the same phenomenon" (Gray, 2014, p. 20).

My theoretical perspective is symbolic interactionism, "a dynamic theoretical perspective that views human actions as constructing self, situation, and society" (Charmaz, 2014, p. 262). In this view, interaction depends on shared language (spoken and unspoken) and is a symbolic process that takes place "within social, cultural, and historical contexts that shape but do not determine it" (Charmaz, 2014, p. 266).

The aim of this research is to develop a substantive theory[2] about the impact of the socio-cultural context on DT education. Thus, the approach of building theory from

[2] Glaser and Strauss (2017) differentiate between substantive and formal theories. A substantive theory is a theory developed for "a substantive, or empirical, area of sociological inquiry, such as patient

case studies deemed appropriate for this goal. This research strategy "involves using one or more cases to create theoretical constructs, propositions and/or midrange theory from case-based, empirical evidence" (Eisenhardt & Graebner, 2007, p. 25). In order to understand the impact of socio-cultural context on DT education, two DT schools in very diverse contexts were selected as case studies for theory-building (Eisenhardt, 1989).

The review of literature (Chapter 2) revealed a lack of knowledge about the intersection between DT education and its socio-cultural context. Thus, using grounded theory as a methodology could lead to new insights and understanding about this topic. The term grounded theory "refers to both the research product and the analytic methods of producing it" with the purpose of developing middle-range theories (Charmaz, 2008). Grounded theory "serves as a way to learn about the worlds we study and a method for developing theories to understand them" (Charmaz, 2014, p. 17). The methodology is suitable when little is known about the phenomenon in hand, due to its exploratory nature and inductive inquiry style (Birks & Mills, 2015).

Finally, semi-structured interviews, observations and related documents were the most appropriate methods for data-gathering that could lead to rich and socially contextual data. Figure 4 shows the elements of research design for this work.

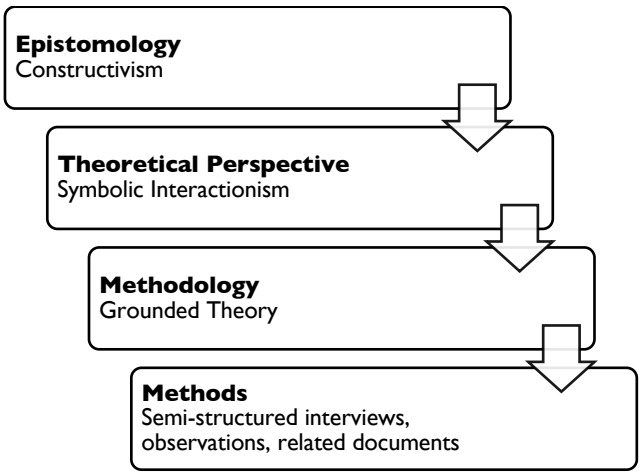

Figure 4: Elements of research design for this work, based on Crotty (1998)

care, race relations, professional education, delinquency, or research organizations." Formal theory on the other hand is developed for "a formal, or conceptual, area of sociological inquiry, such as stigma, deviant, behavior, formal organization, socialization, status congruency, authority and power, reward systems, or social mobility." They argue that both types of theories are considered middle-range theories, falling between "'the minor working hypotheses' of everyday life and the 'all-inclusive' grand theories." (P.32)

3.1 Grounded Theory

The sociologists Glaser and Strauss (1967) introduced their research approach in their book "The Discovery of Grounded Theory" for the first time. Prior to their work, the dominant positivist paradigm of quantitative research labeled qualitative research as "impressionistic and unsystematic" (Charmaz, 2014, p. 6). Charmaz (2008) highlights the importance of Glaser and Strauss contribution to qualitative research, arguing that they made "qualitative research defensible – even respectable – at a time when quantitative researchers had controlled the framing definitions of what counted as research: that is, only what these methodologists could count" (p.399).

Since its origin, grounded theory has evolved into different "schools" (Apramian et al., 2017) "strands" (Urquhart, 2013), or "types" (Sbaraini et al., 2011) which deviate in their views about different aspects such as theory and coding procedure. Birks and Miller (2015) point out that "methodologically, there are no right or wrong approaches to using grounded theory methods; however, there are differences that need to be taken into account" (p.9). Apramian et al. (2017) recommend researchers to inform themselves about the different schools of grounded theory so that they can better communicate about the methodology, but not to treat "each school purely as mutually exclusive theory-methods packages" (p.363). Discussing the differences among the grounded theory schools is beyond the scope of this work, but interested readers may visit Apramian et al. (2017).

Today, the application and popularity of grounded theory has grown beyond sociology to other disciplines including business (e.g. O'Reilly et al., 2012), healthcare (e.g. Foley & Timonen, 2015) and information systems (e.g. Wiesche et al., 2017). Considering my epistemological and theoretical position, constructivist grounded theory, pioneered by Kathy Charmaz (2014), was chosen as the primary methodological approach in this research. Constructivists hold the following underlying assumptions according to Charmaz and Henwood (2017): 1) researchers are a part of what they see, not apart from it; 2) values and facts are connected, not separate; 3) views are multiple and interpretive, not singular and self-evident.

This methodology offered flexible guidelines and heuristics (Bryant & Charmaz, 2007) that were appealing for the purpose of this work. In addition, I subscribe to

constructivist's view on data "as contingent upon language, co-constructed with participants, and rooted in relationships and the social, cultural, historical, and situational conditions of the production" (Charmaz & Henwood, 2017, p. 239).

Constructivist grounded theory "embraces reflexivity and takes positionally into account – of the researcher's starting point as well as the conditions shaping the research situation, process, and product" (Charmaz & Henwood, 2017, p. 239). Birks and Mills (2015) describe reflexivity as "systematically developing insights into your work as a researcher to guide your future actions" (p.52). Thus, engaging with reflexivity throughout the research process is important, as Levy (2003) argues, "not in order to suspend subjectivity, but to use the researcher's personal interpretive framework consciously as the base for developing new understandings" (p.94).

I embraced reflexivity throughout this project to stay sensitive to how my assumptions, pre-existing knowledge and prior experiences may shape the research. I am not separated from my own socio-cultural context and influenced by my life experiences. My prior experiences and current views influenced me in both positive and negative ways throughout the research process. I have lived, studied and worked in different countries, away from the place I grew up in Tehran, Iran, for over a decade. My prior experiences as an immigrant student drew my attention to certain aspects of the interviews, for instance. My background as an educator, teaching DT for many years in different contexts contributed to identifying gaps in the existing knowledge. Engaging with constant reflexivity throughout the research process helped me acknowledge and manage these influences.

Other general strategies of constructivists grounded theory include: Engaging in simultaneous data collection and analysis, applying constant comparison at each level of analysis, developing emergent concepts, and adopting an inductive-abductive logic (Charmaz & Henwood, 2017).

3.2 Case Studies

There are several advantages for building theory from multiple case studies according to Eisenhardt and Graebner (2007), including broader exploration of research

questions, enabling appropriate levels of construct abstraction, and a more robust theory as the propositions are grounded in varied empirical evidence. Unlike quantitative research, samples for qualitative research are usually purposeful and small (Miles & Huberman, 1994). Purposeful sampling according to Patton (2002) means "selecting *information-rich* cases whose study will illuminate the questions under study". Purposeful sampling leads to "insights and in-depth understanding rather than empirical generalizations" (p. 273).

The two case studies used in this research, namely the d-school at University of Cape Town (UCT) and Genovasi in Kuala Lumpur, were selected for the following reasons: Firstly, they both represent early examples of DT education in their own countries. Secondly, they were two distinctly diverse contexts that would offer valuable insights regarding the research questions. Thirdly, these cases can be seen as extreme cases (Eisenhardt & Graebner, 2007) of geographic and cultural dispersion, that allow for theoretical development due to their strong contrasts (Värlander et al., 2016). Finally, both schools were developed with different levels of collaboration and exchange with the two pioneering DT schools, d.school at Stanford and HPI d-school in Potsdam (e.g. coaches' training). Discussing the levels and nature of these collaborations is not the focus of this work.

In the following sections, I provide a brief overview of both schools and their demographic and socio-political contexts. More detailed information about the programs themselves are provided in Chapter 4. Note that the following overview cannot give a complete picture of the nuances of both countries. However, they shall help readers to better understand some aspects that local educators discuss in the interviews, presented in Chapter 4.

3.2.1 d-school at UCT, Cape Town, South Africa

The Hasso Plattner School of Design Thinking at University of Cape Town (d-school at UCT) was established in 2016 as the first DT school on the African continent (HPI d-school, 2017). The school is one of the pioneering academic institutes in the region that offers DT trainings to universities, as well as to the public and private sector (UCT Graduate School of Business, 2016). As the name suggests, it was funded by the Hasso Plattner Foundation. The school is currently located at UCT's Graduate School

of Business campus at the V&A Waterfront in Cape Town. However, building of a new campus began in October 2020 and the construction is set to be completed in 2022 (Global Design Thinking Alliance (GDTA), 2020).

Figure 5: First pilot class of 2016, taken from the d-school eBooklet 2016 Semester 1 (d-school at UCT, 2016)

The first academic program called the pilot Foundation Program, started in March 2016 and ran for 10 weeks (Omar, 2016). In the Foundation Program, students work in multidisciplinary teams on projects with partners ranging from NGOs, private companies to governmental projects (d-school at UCT, 2018). In the beginning, these semester-long programs were offered only to postgraduate students from different departments within UCT. Today, the school has broadened its outreach by offering the 12-week Foundation Program to undergraduates and postgraduate students at institutes of higher education beyond UCT and across South Africa (dschool.uct.ac.za, n.d.). The school has also collaborated with the public and private sector in other African countries including Morocco, Kenya, Ghana, and Malawi (d-school at UCT, 2018).

In order to understand some of the challenges that informants mention during interviews, it is important to provide some contextual information. Although discussing the complex history of South Africa with regards to colonialism, apartheid and their legacies is beyond the scope of this work, I believe it is important to remind my readers about the modern socio-political landscape of the country.

South Africa is a country with a rich diversity of cultures. There are 11 official languages spoken in the country, including Xhosa, Zulu, and English (Statistics South Africa & StatsSA, 2020). The most recent national census in South Africa was conducted

in 2011 (Statistics South Africa, 2011). According to the census, the population of South Africa is about 52 million people and the demographic composition of the country is as follows (note that the labels are a holdover from apartheid era): 80.8% Black African, 8.8% Colored, 7.8% White, and 2.6% Indian or Asian (Statistics South Africa & StatsSA, 2020).

Apartheid is "a set of racially discriminatory policies and enforced racial segregation" (Seekings & Nattrass, 2008) that was imposed in South Africa from 1948 to 1994. Under apartheid, four racial groups were recognized: Black Africans, people of Indian and Asian decent labeled "Indian", people of mixed descent labeled "Colored", and the minority Whites who ruled the country (Thobejane, 2013). Education in apartheid was racially segregated, designed to ensure that the minority White maintained economic advantage and higher positions in management and leadership, while keeping Black South Africans and other racialized groups in inferiorized positions (Alexander, 2016; Christie & Collins, 1982; Seekings, 2010). It is naive to assume that many inequalities that were carefully designed into all facets of South Africa would simply disappear after apartheid ended, as Seekings (2010) explains:

> In 1990, Nelson Mandela was released from prison, the African National Congress (ANC) and other organizations were unbanned, and negotiations over political change began. Four years later, in 1994, the country held its first democratic elections, won by the ANC. By 1994, almost all legislation which discriminated on explicitly racial grounds had been abolished: people could now vote in elections, live or attend school anywhere, do any work, and marry and have sex, all without regard for racial classification. Inequalities, however, remained: the legacy of the past could not be undone overnight (p.4).

Today, more than two decades after apartheid, South Africa is among the most unequal countries in the world (The World Bank, 2018). According to one of the latest World Bank reports "race still affects the ability to find jobs, as well as the wages received once employed" (2018, p. xiv).

The d-school at UCT is operating against the backdrop of such complexities, as the founding director, Richard Perez pointed out in an interview:

> The complexity we face locally, and on our continent, as an emerging market with diversity in culture and history makes for a unique opportunity to understand and develop new applications of design thinking. Plus, it's an opportunity for us to contribute to understanding and resolving the complex socio-economic challenges of our region (UCT Graduate School of Business, 2018).

3.2.2 Genovasi, Kuala Lumpur, Malaysia

Genovasi was launched in August 2012, with the goal to "equip Malaysians with an innovative mindset using the Design Thinking (DT) methodology" (dschoolmalaysia.com, 2019). Unlike its counterparts, Genovasi was not affiliated with any university when it started. As one of the program managers explained:

> I think one thing that's interesting about Genovasi that I think is not true for both Stanford and HPI is that we are not associated with any other college. We are kind of like on our own. So, we're kind of like this certificate design thinking course that has kind of little to borrow from in terms of recruiting pipeline. So, for us, kind of the mandate to bring innovation skills to Malaysia was trickier (G5, P18).

In the beginning, the school experimented with various formats: From weekend courses and evening classes to offering longer programs for different government agencies. Today, Genovasi works with both the private and public sector, offering a range of programs (dschoolmalaysia.com, 2019). In addition, they have launched the Genovasi University College, "a Design Thinking-dedicated institution of higher learning geared towards Industry 4.0 readiness" (Genovasi University College, 2021).

Figure 6: A coach at Genovasi working with a team, taken from (Genovasi Malaysia Sdn. Bhd., 2018)

Malaysia is a country with about 32 million people with different religions and cultures (World Population Review, 2021). The ethnic composition of the country according to the 2010 national census was: 67.4% Malays and indigenous people (referred to as Bumiputera), 24.6% Malaysian Chinese, 7.3% Malaysian Indian and 0.7% other (Department of Statistics Malaysia Official Portal, 2011). Each group has their distinct cultural and religious heritages (Rose et al., 2007). Islam is the official religion of the country and the most professed religion (61.3% according to the 2010 census). According to the government website, despite Islam being the official religion, "the Malaysian population which consists of various ancestry and beliefs, are free to practice their respective faith. This freedom shapes a strong unity between the races and this is proven by the peaceful environment achieved by Malaysians" (Malaysia Department of Information, 2016). After Islam, the most popular religions in the country are Buddhism, Christianity and Hinduism (Department of Statistics Malaysia Official Portal, 2011). The national language of the country is Bahasa Malaysia. In addition, other languages such as English and Mandarin are spoken to some degrees by different communities (Ghazali, n.d.).

3.3 Data Collection

Charmaz (2014) recommends data collection until *theoretical saturation*, meaning to the point where the researcher is not hearing anything new from the informants

(Sbaraini et al., 2011). However, *theoretical saturation* does not mean that the researcher knows everything about the phenomenon (Charmaz, 2014). Eisenhardt (1989) explains that "in practice, theoretical saturation often combines with pragmatic considerations such as time and money to dictate when case collection ends. In fact, it is not uncommon for researchers to plan the number of cases in advance" (p. 545).

In this work, the case studies happened within two successive months. Prior to my research visit, I was in correspondence with both schools in order to find the optimal time. I visited the d-school at UCT in March and Genovasi in April 2017. Table 4 and Table 5 show the schedule of the programs and the duration of my visits. The introductions to both schools were made through a colleague at the Hasso Plattner Institute.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	13.03.2017		15.03.2017			
	Launch of the 3-week project		Empathy lunch + Empathy workshop			
	20.03.2017		22.03.2017			
	Cultural diversity talk		Prototyping and testing			
	27.03.2017		29.03.2017			
	Presentations		Start of the 8-week projects			

Table 4: The 3-weeks project schedule of the first semester of 2017 at d-school at UCT.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
07.04.2017	08.04.2017	09.04.2017	Public holiday	11.04.2017	12.04.2017	
Program day	Program day	Program day		Program day	Program day	
	15.04.2017	16.04.2017	17.04.2017	18.04.2017	19.04.2017	
	Program day	Program day	Program day	Program day	Program day	

Table 5: Schedule of the Design Thinking Innovation Ambassador Program 2017 at Genovasi.

It is worth noting that while I was present during the entire 10 days of the program at Genovasi, I visited the d-school at UCT only from the second to the fourth week of the semester for a total of six days of the program. However, my goal was to learn about the perspective of local educators and their adaptions, which were not negatively affected by the different time spent on location. Both programs are described in detail in Chapter 4. This research used three sources of data including semi-structured interviews, observations, and related documents which are discussed in the following.

3.3.1 Semi-structured Interviews

The main source of data collection in this work were semi-structured interviews with educators at the schools. Considering that knowledge is situated and contextual, the goal of interviewing according to Mason (2002) is "to ensure that the relevant contexts are brought into focus so that situated knowledge can be produced" (p.62). Gioia et al. (2013) refers to informants as "knowledgeable agents" who are aware of what they are trying to achieve and can explain their actions, intentions and thoughts behind them. On the other hand, they call researchers "glorified reporters" whose job is to "give an adequate account of the informants' experience" without imposing prior theories or constructs on them.

Upon my arrival, I introduced myself to the teaching teams at the schools and explained my intentions. I asked them to offer me an interview slot according to their availability. I interviewed the founders of both schools, all the program managers involved and most of the coaching teams. In total I conducted 22 one-on-one interviews, each lasting between 45 to 90 minutes. The interviews were mostly conducted at the schools or the nearby cafes. Table 6 gives an overview of the interview partners and their roles.

d-school at UCT	Founding director	U5	1
	Program managers	U1, U9, U10	3
	Coaches	U2, U3 U4, U6, U7, U8, U11, U12	8
Genovasi	CEO/Executive director	G10	1
	Program managers	G1, G5, G8, G9	4
	Coaches	G2, G3, G4, G6, G7	5

Table 6: Roles and ID of interview partners at d-school at UCT and Genovasi

Following Gioia et al.'s (2013) recommendation, I started with an interview guide (see Appendix 8.1), but remained open to change as the research progressed. In this way I could assure that all interviewees were asked about the same topics while being flexible enough to follow their cues and "adjust on the fly" (Gioia et al., 2013). Each interview began by an introduction, the overall research goal and remarks on anonymity. My first question served as an ice-breaker where I asked the informants to introduce

themselves and describe their educational and cultural background. Some of the questions asked included:

- What are the main learning outcomes of the program?
- What were some of the strategies and practices that you used to adapt the methodology to your context?
- What are some of the most challenging aspects of the methodology for the learners?

To maintain accuracy, all interviews were recorded with the permission of the informants. I took notes during the interviews and upon the completion of the interviews, I summarized aspects that stood out to me in a separate document.

3.3.2 Observations and Related Documents

Field observations were another important source of data collection. I attended the programs during my stay and took field notes about important observations and the overall ambience. On the first day of attending, I introduced myself to the participants and explained my intentions. Figure 7 shows the designated notebooks I carried for each field visits.

Figure 7: The two notebooks I used to record field notes and ideas during my stays.

Writing field notes was a complimentary part of my research as it allowed me to keep track of new areas of inquiry and possible interview questions. Days without scheduled program were spent with the staff, in order to immerse myself in their context and build rapport.

Other documents that I used as complementary resources to the interviews and field notes included teaching templates, schools' websites and related press. In addition, I took pictures with my phone during the field visits to document the environment.

3.4 Data Analysis

Eisenhardt (1989) calls data analysis the "heart of building theory from case studies" and "the most difficult and the least codified part of the process" (p.593). They argue that there often is a disconnect between data and conclusions in qualitative studies since they allocate little space to discussions about analysis (Eisenhardt, 1989). Traditionally, data analysis has been viewed as a "mysterious process" and "with no guidance" (Hammersley & Atkinson, 2007, p. 162). However, some qualitative researchers have tried to introduce structure and guidance to better communicate this crucial part of the research process (e.g. Charmaz, 2014; Gioia et al., 2013; Harrison & Corley, 2011).

In this thesis, I followed the advice of Gioia et al. (2013), who in "Seeking Qualitative Rigor in Inductive Research: Notes on Gioia Methodology", offer recommendations on presenting research findings "in a way that demonstrates the connections among data, the emerging concepts, and the resulting grounded theory" (p.17).

In this work, the analysis began during the data collection. After each interview, I summarized the highlights in a text document. At the end of each day on the site, I noted down the key issues that arose from the interviews and observations. This allowed me to seek additional information through sampling new interview partners or look into relevant materials, known as *theoretical sampling* (Chun Tie et al., 2019). Birks and Mills (2015) describe *theoretical sampling* as "the process of identifying and pursuing clues that arise during analysis in a grounded theory study" (p.68). However, a more systematic analysis of the data was not possible during the field visits due to lack of time. Timonen et al. (2018) point out that although collecting and analyzing data in tandem is ideal for grounded theory studies, but is not always possible, "particularly when interviews are the sole or principal method of data generation and the time frame available is short" (p.5). Thanks to the rapport that I had built with the informants and their generosity, I

could contact them after my visits and ask further questions, when needed. I contacted three informants via email or WhatsApp for further questions and clarifications.

After the field visits, all 22 interviews were transcribed using a transcription service. However, there were many mistakes in the transcriptions (perhaps due to the lack of familiarity with the variety of English accents spoken in both fields). Thus, I had to proof-read all the transcripts with the audio recordings from the interviews. Although tedious, it was valuable for allowing me to become fully immersed in the data again. The coding process began once all the transcripts were transferred to a qualitative data analysis software called MAXQDA[3]. Charmaz (2014) calls coding the "pivotal link between collecting data and developing an emergent theory to explain these data" (p.46), and describes it as "categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data"(p. 43).

As the two cases differed on several aspects (e.g. audience, length, socio-cultural context), I coded the cases separately – starting with the Genovasi data. The initial coding was a combination of line-by-line coding as well as coding longer segments and paragraphs. Following Gioia et al. (2013) approach I coded all my data in 1st-order codes which were close to the informants' language, using their terms to try to "understand their lived-experience[4]" (Gioia et al., 2013). At the end of the initial round of coding, there were 559 unique codes for both cases, including 269 for UCT and 290 for Genovasi. Collection of similar codes within each case led to the development of 1st-order concepts, which were constantly re-examined. The 1st-order concepts were then grouped into 2nd-order themes, which added another layer of abstraction to the analysis.

Once I acquired a preliminary level of structure in both cases – in other words, a manageable number of concepts and themes were developed – I began the process of *constant comparison* which led to several iterations. Charmaz (2011) describes this process as moving across data and comparing "fragments of data with each other, then data with codes, codes with categories, and categories with categories. Each comparative step successively raises the level of abstraction of the analysis". (p.172). Figure 8 shows a segment of the final data structure. Additional supporting evidence for the segment is

[3] www.maxqda.com

[4] "Personal knowledge about the world gained through direct, first-hand involvement in everyday events rather than through representations constructed by other people." (Oxford Reference, n.d.)

shown in Table 7, which represents the data underpinning the 1st-order concepts. The full data structure is presented in Appendix 8.2 and 8.3.

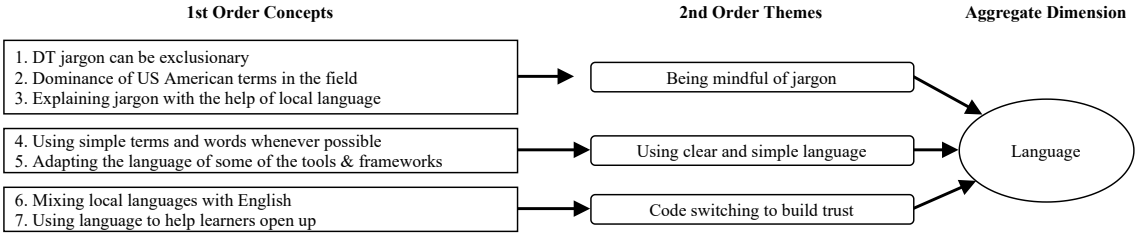

Figure 8: Excerpt of the data structure for Genovasi.

Memo-writing was another technique that allowed me to capture my ideas about what was happening in the data. Strauss(1987) describes memos as "running record of insights, hunches, hypotheses, discussion about the implications of codes, additional thoughts, what not" (p.110). Charmaz (2011) advocates for writing memos, calling it "a pivotal grounded theory strategy that prompts the researchers to engage in early data analysis and writing about their emerging categories" (p.174).

Memos included some of my thoughts about codes, concepts and themes that were emerging, and possible directions for further analysis. Memo-writing was a helpful tool to engage with reflexivity and examine the assumptions and viewpoints that might affect my interpretations at different levels of the analysis. Figure 9 shows an example of a memo regarding my progress after an initial coding of the Genovasi case. It also demonstrates how *constant comparison* was an integral part of the analysis process.

I cycled between the literature and the concepts, themes and dimensions that were emerging to see if my findings had precedence and whether I had discovered new concepts (Gioia et al., 2013). Eisenhardt (1989) also writes about the importance of enfolding literature:

> An essential feature of theory building is comparison of the emergent concepts, theory, or hypotheses with the extant literature. This involves asking what is this similar to, what does it contradict, and why. A key to this process is to consider a broad range of literature (p.544).

Aggregate dimension: Language	
Avoiding jargons	
1. DT jargon can be exclusionary	1.1. "I want to develop trust with them. I don't want to create a gap where … Because sometimes locally, they can be a bit intimidated by the way you speak. If the way you speak is very … it's almost like there's a lot of slang in it, it's just like fancy approach, it's hard for them to express themselves" (G1, P27)
2. Dominance of US-American terms in the field	2.1. "Sometimes using a more local words or phrases that depicts the same meaning, makes more sense. Sometimes you'd be surprising, even things like, you know, in our POV we have: We met, we discovered, we aim to help. The last phrase that we use, 'We aim to help', instead of we aim to help, the Stanford professors, they introduced us to this phrase called, "It will be game-changing to". So even sometimes when we introduce that, it can create a lot of, not to say confusion, but issues. It depends on how familiar you are when it comes to some of this casual American language" (G8, Pos. 128) 2.2. "So, sometimes [to] radical idea, they [the instructors at Stanford d.school] say, 'out of the orbit idea'. For them, that is very normal. And sometimes when we do warm-ups, we have people working in pairs, and if you don't have a pair, they call it 'free radical'. I studied in the States for four years so I can somehow get it, what they mean by free radical, but even for some of the coaches here, they find some of these words that they use a bit confusing. But the cheerful and playful nature of these words, I personally find very exciting and interesting. But again, it has to do with understanding your audience when you're delivering it. Because if you have to explain the explanation that is actually just making it a bit more difficult for them to grasp the material, especially if it a condensed and short period of time. So necessarily, some of these nuances we intentionally changed to make it simpler and even words that they can even relate to better" (G8, P132) 2.3. "I do really understand that language is super important" (G1, P29)
3. Explaining terms and jargons with the help of local languages	3.1. "Human-centered as a phrase is not intuitive for them to understand, 'Oh, I get that'. User centric. You have to explain what a user is and what does centeredness mean. That could be a Malaysian thing as well language wise. It's not a common thing we use. A lot of these jargons are derived from American school and German school. Once they understand the context of what we mean by human centric, they get it, they get it. I think that's easiest for them. The rest will have difficulties" (G2, P107) 3.2. "Well we've been translating our materials into Malay. I actually been, I don't know about other coaches, I actually been testing it out quite subtly with the participant like the word 'iteration', how can you explain it to Malay? Some things even like 'How Might We', it's not really a day to day word that you use and it's like, 'Hey [a coach name], what is How Might We?' You need to explain it into Malay. So, understanding the purpose of our, we call it jargon and then contextualizing it into Malay. It doesn't necessarily mean that you need to direct translate it in Google, but you can simply change it to actually cater the taste or the needs" (G7, P42)
Simplifying the language of instruction	
4. Adapting the language of some of the tools and methods	4.1. "I always look for really simple, simple explanation. I really look at … I really think to how do I … every time I simplify this, simplify especially even to the coaches, for example, a *Define* statement…less words I use, sometimes I think about all that to help coaches and to help the participant, to help them facilitate" (G1, P29) 4.2. "When I was a participant, also, there was a lot of attention paid to how our POV sounded, so if it's like this word was not quite right, we would die die [*sic*] have to fix it. So, we would even have to go through the *wheel of emotion*, where you pick out the right word and things like that. Whereas now, as long as the coach understands what you're trying to say, and the language and the POV is quite messed up, because they write the POV in English and some of the English is just not comfortable for them. We sort of accept it, and it's fine. You don't have to have the perfect word at POV, whereas back then, there was a lot of emphasis on having the words right" (G9, P64) 4.3. "So even the design challenge had to be curated in a different language sometimes to get it there. If I say 'How can we redesign the exploitation of human rights in Malaysia', so even the word exploitation has to be clear on both languages if there are diversity in the group. So, there may or might not be a direct word for exploitation, even the understanding the true gist of the meaning, where the word originated from is different" (G6, P42)

5. Using simple terms and words whenever possible	5.1. "I do know that the language we use sometimes can be very difficult for people to understand, not everybody's grasp of English. I don't take for granted that part. I do believe that some people won't understand like inferring is what and so I say interpret, interpret that thing" (G1, P27)
	5.2. "So, for us, it is very hard for coaches to then go in and say, 'Hey, this is what empathy means', because there are slight deviations in people's take on it is. Like *analogous ideation*, there's no direct substitute, I wish there was, then we can explain that concept for them. So, for me, our biggest challenge is to explain it to stick to the syllabus of Stanford word for word. So, what we had to do was translate it to turn into a layman, less sophisticated language, but more action, more experience for them to understand what we actually mean, and that's why you see our slides and our syllabus, our notes are kept to very simple language" (G6, P40)
	5.3. "The more simple the language, the better it is, the better the understanding. Therefore, I always look for really simple, simple explanation" (G1, P29)
Code switching to build trust	
6. Mixing local languages with English	6.1. "Our program in the beginning, we teach it primarily in English, which is a language that is not exclusive to any of the races. So, meaning, the Indian, Malay, Chinese, they all have their mother tongue. English is actually a second language for all. That's actually common for all. So, we make it a point to deliver the program in English, which helps to get the message across most of the time. Again, depending on the situation, if we notice that they more prefer the Malay language as what we use in the context of the government sector, we also mix it a bit so that they can understand a little bit more" (G8, P134)
	6.2. "I'll use certain local languages to get them to understand that. That's one, because the level of English proficiency might not be as commanding as. Even myself, sometimes when I'm at the States, the stuff they talk, I'll be like, 'Wow'. Maybe because I've been there a few times I got the hang of it" (G1, P29)
	6.3. "Using their natural language, especially in the government class. If you can just translate everything to them, just do it. They are already ... It's rarely for you to actually see someone who are very experienced in English because Malay is their mother tongue. That's the first thing, language" (G7, P105)
	6.4. "The very first thing I do is I speak in both languages. I speak in both Bahasa and in English and to some participants who get it, I also use Mandarin." (G6, P73)
7. Using language to help the learners open up	7.1. "The first thing is language. Because different people and different levels of English and BM. Malays, a lot of the time, maybe not during the inputs because they're so used to delivering inputs in English, but within the teams itself, the coaches do mix up the languages sometimes. So English and BM, because even if participants understand completely all the English words that we're using, it really makes them open up and feel more comfortable when they know that you can mix more languages. So, it's like, okay you're one of us, you know?" (G9, P43)
	7.2. "Sometimes when I Rojak in ... Rojak is a Malay dish where you ... It's a mixture of fruits and savoury things and sweet things. When we say Rojak Bahasa, we mean mixing English and Malay... Anyway, I use Rojak Bahasa and I'll just ... So far, I found out that's the best way to get on their level and for them to get me. It's a two-way thing. Although I know they will love it if I speak all Malay, but I am not as effective as I could be. I need to do that. I try Rojak. I come down and I make them come here, so in the middle ... Maybe in the middle guys. I'll say everything in English, but you make me explain. I'll put some Malay words in that for you to really get it. That has worked a lot" (G2, P111)
	7.3. "I want to develop trust with them. I don't want to create a gap where … Because sometimes locally, they can be a bit intimidated by the way you speak. If the way you speak is very … it's almost like there's a lot of slang in it, it's just like fancy approach, it's hard for them to express themselves. What I'm doing there is really modeling the fact that language is not a big deal. I'm modeling the fact that as long as you need to express yourself, I'm okay with it, because as long as I understand … Which is why I model a local language, not other language, because I would understand. I want them to express themselves and to be able to realize that language is not a big deal, not so much. Not participating, not showing up is a big deal. I don't want them to not have an amazing experience just because of language" (G1, P29)

7.4.	This is an interesting discovery I have of myself. I'm most comfortable speaking in English, so I have no problems teaching in English and all that. I want my participants to do that, to be more fluent in English and just communicate better in English. Through coaching, I found that it's quite a struggle for a lot of them. Predominantly in the Malays, so the people who are Malay, not all of them have a good command of English. In the beginning, I tried to fix that. I wasn't being user centric. I was being me. I was thinking like, 'Hey, they have to know this because they do because they need to understand what I'm trying to say.' Eventually I discovered that it was a wrong habit to do that, imposing my beliefs on what they need to know in the language because to communicate design thinking, I can only do it in that way. Tell them in English because that's how I know it to be. Then as I was doing more classes and some of them ... People from ministries, I discovered that actually it's useless if I keep pushing something and feel like they don't get it. I tried to improve and be more inclusive by including more Malay languages in my speech. Although I'm not really good, I think I have improved actually quite a bit since day one of coaching. I see an improvement in how my bond is with my participants" (G2, P57)

Table 7: Excerpt of data for the 1st Order concept of Language for Genovasi.

I contextualized my findings with a broad range of literature which is presented in Chapter 5. Timonen et al. (2018) argue that all grounded theory studies should begin with an aspiration to theory-building. Bryant (2017) also writes that the results are grounded theories, "although these may also be termed models or frameworks or conceptual schemas" (p.99). Morse (1994) describes the resulting theory as "the best comprehensive, coherent and simplest model for linking diverse and unrelated facts in a useful and pragmatic way. It is a way of revealing the obvious, the implicit, the unrecognized and the unknown" (p. 25).

I have coded the Genovasi case already. I will iterate on some codes I'm sure, but at this point I rather move on to the UCT case to see if and how the same structure works.

At this point I see the adaptation and localization happening on the following levels:

- Rituals (warm-ups, team chants, debriefs,…)
- Environment (humor of the coach, music, space,…)
- Mindsets v. methods (modeling behavior, highlighting good behavior, demos, 12 commandments, …)
- Delivery (language, messages from the instructors, …)
- Coaches role (role models, facilitators, …)

Figure 9: A memo written after initial coding of the Genovasi data.

One of the risks of theory building from case studies according to Eisenhardt (1989) is the "temptation to build a theory which tries to capture everything" due to the large volume of rich data. I was aware of this issue and while there were numerous themes and concepts, I tried to focus on those that were most relevant to my research questions. After several iterations and comparison among cases and coincident with consulting the relevant literature, I decided to step back from the data analysis software and work with pen and paper for building a substantive theory. This helped me to visualize my ideas freely and take a level of abstraction, what Reichertz (2007) refers to as abductive thinking, an "intellectual jump which adds something very new to the data".

Charmaz (2014) calls this "practice" *theorizing* writing: "My preference for theorizing - and it is for theorizing, not theory - is unabashedly interpretive…It entails practical activities of engaging the world and of constructing abstract understandings about and within it" (p.233).

Figure 10 shows several early prototypes of the proposed model, which eventually evolved into the Model of Socio-Cultural Adaptation of DT Education, presented in section 5.1.

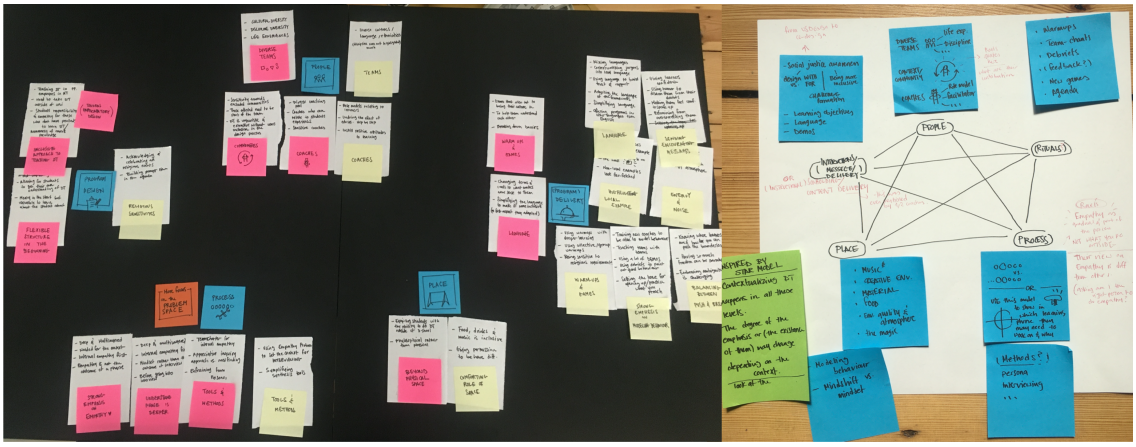

Figure 10: Early physical prototypes of the model of Socio-Cultural Adaptation of DT Education.

3.5 Strengths

Many of the findings from this research align with existing literature (see Chapter 5), which as Eisenhardt (1989) suggests contributes to the strengths of such research:

> While linking results to the literature is important in most research, it is particularly crucial in theory-building research because the findings often rest on a very limited number of cases. In this situation, any further corroboration of internal validity or generalizability is an important improvement (p. 545).

Regarding quality evaluation, Charmaz and Thornberg (2020) argue that not only grounded theory research requires its unique set of criteria, but also these criteria vary across different schools of grounded theory. They propose the following criteria for judging the quality of constructivist grounded theory studies: Credibility, originality, resonance, and usefulness.

Credibility refers to gathering sufficient data, making systematic comparison, conducting a thorough analysis, as well as engaging with reflexivity throughout the research process (Charmaz & Thornberg, 2020). In the previous sections, I explained how these principles informed data gathering and analysis. In addition, adopting reflexivity helped me to manage my assumptions, previous experiences and potential biases to make sure they did not interfere with how the data was interpreted.

In terms of originality, this work draws attention to an under-studied, yet important phenomenon and offers new insights into how DT education can account for the socio-cultural context it serves. In addition, it contributes to an understanding of different factors in play in designing and delivering DT courses. In order to gain resonance, Charmaz and Thornberg (2020) recommend researchers to adapt their strategies of gathering data to demonstrate the informants' experiences. As mentioned previously, I adapted my interview questions when needed, followed the informant's cues, refrained from using leading questions and enforced pre-defined notions.

Finally, usefulness refers to offering a foundation for application and contributing to new lines of research. The findings from this work can help educators and practitioners to create DT courses that account for the socio-cultural context they wish to serve. Moreover, a list of recommendations is provided in Chapter 5 to facilitate their efforts.

In addition to these criteria, using data triangulation contributed to the strength of the research (Patton, 2002). Finally, I shared my findings and data structures with three other researchers and gathered their feedback regarding the emergent concepts, themes and overarching dimensions.

3.6 Limitations

There are several limitations in this study. First, due to the nature of the study design, the quality of the research is dependent on the researcher's skills, as Charmaz (2014) points out: "Grounded theory relies on the researcher's grappling with the data and interpreting them. Other grounded theorists might have developed similar or somewhat different categories from the data, depending on the content and direction of

their coding." I acknowledge that other qualitative researchers might have interpreted the data differently, leading to different findings. My hope for this chapter and the detailed account of data gathering and analysis was to gain the reader's confidence in my ability to carry-out the research.

Another limitation concerns the schools' approach in teaching DT – what Matthews and Wrigley (2017) categorize as HCD programs (see section 2.2). Although both schools differ in aspects such as audience and duration, they were both on some level designed in collaboration with the HPI d-school and d.school at Stanford. Therefore, many aspects of their programs were directly influenced by their Western counterparts. These influences will be discussed in Chapter 4 and 5. An independently developed DT program in each context might look very different.

Another limitation of such exploratory study is that the findings do not easily lend themselves to generalization, and the insights drawn from this approach are context-specific and not necessarily universal. As Whetten (1989) explains: "Who, Where, When. These conditions place limitations on the propositions generated from a theoretical model. These temporal and contextual factors set the boundaries of generalizability, and as such constitute the range of the theory" (p. 492). Although the findings may not be exactly replicable in another context, course designers can draw insights they deem relevant to their own context. The proposed model presented in Chapter 5 shall guide practitioners and educators to attend to various factors in the design and delivery of DT courses, to create learning experiences that resonate with their context.

Finally, only literature published in English was consulted for this thesis, thus national reports or other relevant literature might have been overlooked. This risk was minimized by ensuring to include works of authors from the respective countries.

4 Findings

This chapter comprises the findings from both cases accompanied by the informants' voices. Please note that the level of English proficiency varied greatly amongst the informants, with many speaking English as their second or third language. As long as their message was clearly conveyed, I left the quotes unedited, even if they were not grammatically correct.

The chapter is structured in the following manner: I first provide an overview of both programs. Afterwards I discuss how the educators adapted the DT education to their own context by presenting quotes from in-depth interviews and my own observations from the field. It is worth mentioning that the informants' responses were very rich but in the interest of space and time, a representative sample of their quotes will be presented.

4.1 Overview of the Programs

4.1.1 d-school at UCT: Foundation Program

I visited the d-school at UCT in the first academic semester of 2017, which was the school's third Foundation Program since its inception in March 2016. The participants of this semester were 25 postgraduate students from different faculties of UCT from different disciplines. It was a very international cohort with 11 students from South Africa and the rest coming from other African countries and Europe.

The program ran for 12 weeks from March to June 2017, consisting of two full days per week. For the majority of the semester, students worked in multidisciplinary teams of five on real projects brought in by project partners from a variety of fields, such as health and finance. Each team was accompanied by one coach, many of whom had gone through DT training either as professionals or as former students. The coaches were led by program managers, who were responsible for designing the curricula, as well as delivering and facilitating the program. At the time of my visit there were two program managers responsible for the semester and one for professional training with other partners.

It is worth mentioning that the leadership of the school came from design disciplines. The school's founding director had an industrial design engineering background and had worked in the field of design in both private and public sectors for many years. In addition, two of the program managers held PhD degrees in design.

Figure 11: Students of both Foundation and Advanced Programs on the first day of the semester, getting to know each other through an exercise, taken from (d-school at UCT, 2017a)

The first week of the program was designed for the students to get to know each other through various hands-on activities while applying some of the DT methods, such as qualitative interviewing. What was called the "3-week-project" started in the second week, where students worked on design challenges given by program managers. The 3-week-project was the first time that the students experienced the DT process and applied its different methods. After this first DT experience, they rearranged the teams and worked on a design challenge introduced by a project partner for the remaining 8

weeks of the semester. I visited the school during the 3-week-projects, as students were embarking on their very first DT experience.

In this semester the d-school also ran their very first "Advanced Program" for those students who had gone through the Foundation Program in previous semesters. Although the main focus of this work is on the Foundation Program - specifically on the introductory weeks when novices are introduced to DT - I will also present some of the interesting strategies from the Advanced Program that were relevant.

4.1.2 Genovasi: Design Thinking Innovation Ambassador Program

The Design Thinking Innovation Ambassador Program (DTIA) was designed to train government cadets. The program participants were 188 Diplomatic and Administrative Service (PTD) cadets (Ibrahim, 2017a) and were fully sponsored by the government (Toh, 2017). This program is a good example of the Malaysian government's push for introducing DT into various areas of the public sector, as one of the program managers explained:

> So, the course we just ran was for the PTD cadets. So, they are government cadets who have signed on and they've been put in, I believe it's a ten-month training cycle and they go through many, many modules in that ten months. Our program is a required module for all government workers to go through. (G5, P6)

The program was 10 days long, and ran from 7th to 19th of April 2017, including a weekend and a national holiday. Following one of the program manager's advice, I arrived two days earlier to get to know the teaching team and observe their preparation process.

Figure 12: The government cadets arriving and registering on the first day of the program at Genovasi.

The spacious building of the school is well designed for training such a large number of participants. The trainings mainly took place on the first floor which includes four separate studios, with each hosting 47 participants. All studios followed the same agenda, but were led by their own program manager. The role of a program manager – sometimes also referred to as track manager– was similar to the d-school at UCT. They designed different programs, delivered short lectures, and led their studios through the learning activities.

Each studio had four coaches who worked closely with the program manager and each coach was responsible for two teams. For the most part of the training, each studio worked separately in their space. However, for some activities (e.g. warm-ups) all 188 participants would get together in the common space.

Figure 13: Nancy Shukri, Minister in the Prime Minister's Department at the time, giving a speech to the cadets on the final day of the program at Genovasi.

The three first days of the program were called the "Foundation Days", where the teams worked on design challenges given by the program managers and experienced DT process and methods for the very first time. For the rest of the program, each studio worked with an external project partner on their design challenges. On the fourth day, the project partners came to the school to present the design challenge in their respective studios and answered students' questions. They also joined for the final presentations on the last day of the program. Nancy Shukri, Minister in the Department of Malaysia's Prime Minister at the time, also joined the program in the afternoon of the last day and gave a speech to graduated cadets (see Ibrahim, 2017).

4.2 Adapting DT Education

This section presents the strategies and practices that the schools applied to adapt the DT education to their specific context. For the ease of reading I will present each case separately and contextualize the findings with literature wherever necessary.

4.2.1 d-school at UCT

Concerns around social justice issues were highlighted in many interviews. In addition, a desire to move towards participatory design approaches influenced several of the school's adaptation practices presented below.

4.2.1.1 Embracing Diversity Beyond Disciplinary Differences

In DT literature, there often is an emphasis on multidisciplinary teams when talking about diversity (e.g. Chasanidou et al., 2014; Meinel & Leifer, 2012). However, the d-school at UCT emphasized diversity beyond disciplinary differences, encompassing cultural, racial, gender diversity as well as valuing different lived-experiences. The school's website highlights this view as well: "From the beginning, d-school students have represented the diversity across all spectrums (race, gender, religion, discipline, interests, skills, experience and worldview) that we believe is vital for addressing the complex challenges of the modern era." (dschool.uct.ac.za, n.d.)

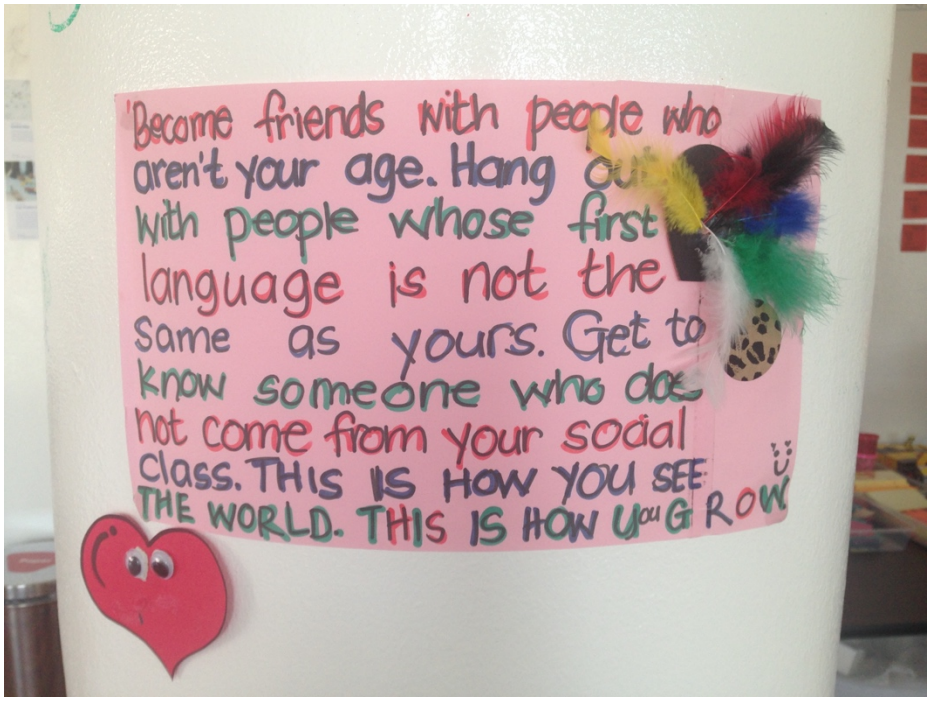

Figure 14: Hand-made poster at the d-school at UCT emphasizing diversity.

Disciplinary tensions among postgraduates seemed inevitable, considering that the students were already immersed in their fields and their respective problem-solving approaches had been shaped by their academic backgrounds. In addition, postgraduates were often used to working with people from their own field, which led to some frictions when working in multidisciplinary teams:

> The challenges obviously, would be people with different backgrounds. People with different interests. And people that maybe are so immersed in their field of study that, and they are postgraduates, so they are kinda down the line. They really have good knowledge of their subject matter. Then I think it's almost

> harder to develop a sympathy or empathy or understanding or tolerance for diversity with people who are from different disciplines. So, I think that is one of the great challenges. (U6, P22)

In addition, students' approaches to problem-solving informed by their academic backgrounds might clash with DT's inherent ambiguity:

> Particularly early on, like there's not an understanding of how design thinking operates as an iterative process. You diverge, and then you converge, and then you diverge, and you converge. I think that for a lot of students upfront, that's quite uncomfortable because they want to have an idea of what the goal is, and they want to work towards that goal. I mean academically for the most part have been that this is what you need to achieve, now work towards it. I think in design thinking it's a lot less clear. It's more ambiguous. (U10, P67)

Finally, students from different disciplines might disagree on how to conduct certain DT methods. The following is an example of such disagreement about conducting user-research in DT:

> And so, when these postgrad students come together and they're doing their research, they say oh you know I'm far more structuralist, or I'm more what have you, and those can clash. And so that belief in how to even do research is very different, and we've seen that come to the forefront and that's something which we've learned now to bring upfront. (U9, P38)

Apart from paying attention to disciplinary differences, the school also highlighted other aspects of diversity. Ensuring that the student cohort reflected the demographic realities of the broader society was very important to them, as explained by the school's founding director:

> And I think a professional diversity is good. It's what Stanford talks about a lot, is that diverse teams working on complex challenges. But what we really noticed, for me, what was interesting here was the diversity of culture in a room, 'cause in South Africa we have very many different cultures. The University of Cape Town has 52 different languages, just in the

> university. Suddenly we got not only professional diversity and gender diversity, but cultural diversity, so I think the richness that we have been seeing in our spaces has been very interesting. I don't think we've quite harnessed its full capacity or potential yet, but I think it's been a very interesting observation which has come out of building a prototype very early with a course and just suddenly starting to see these conversations that are emerging. (U5, P16)

This approach was not without its challenges, as reflected in the following informants' quotes. It is important to note that while not all these quotes are exclusively about DT, they shed light on the dynamics that could affect any learning experience. Considering that the school is located in "one of the most - if not *the* most - unequal cities in the world" (McDonald, 2012, p. 42) discussions around class and socio-economic disparities were inevitable. Almost all informants were concerned about social and economic disparities in the country, as seen in the following quote from the founding director of the school:

> We had apartheid, which was about keeping black people and white people separated, and that was a design. Apartheid was a design exercise and a very good one; it separated people very well. So really in the last 50 years, we've grown up with a whole lot of imbalanced systems in the country from education, to business, to acceptance, to societal acceptance. And if you look at South Africa, there's a great gap between the haves and the have-nots, the wealthy and the not so wealthy, but yet we live side-by-side, so we have a lot of social challenges and dynamics that we don't necessarily have solutions for. (U5, P29)

A lot of the tensions and conflicts within the classroom could be traced back to different levels of sensitivity and awareness about social justice issues, and as a result, different world-views:

> In this context whenever conversations become political, there's clearly people on different sides. That's when people sort of stop listening and start waiting to respond. You know what I mean? Because these are conversations obviously [to] have had. Say, for

> instance, about the student protests[5]. If the conversation ever goes in that direction you can almost look around the room and know who's going to have what opinion just because. I mean these ideas are entrenched, in terms of colonialism and the inequality in South Africa. It's very, very much entrenched to people's being. (U3, P33)

Acknowledging and reflecting on one's privilege seemed to create a point of tension, especially regarding race. Although racial inequity is by no means unique to South Africa, it should come as no surprise if they were more present here, considering the socio-political history of the country. For instance, one coach expressed their frustration with some people not acknowledging their racial privilege and dismissing others' experiences:

> Because there's always the layers and intersections and there's always gender issues and race issues, regardless if people want to see them or not. In South Africa we are very much defined by race. There are very few conversations and a lot of White people like to say, "You made it about race." If in your experience, it's always been about race, then it is about race. You know what I mean? Yeah that's a tough one. (U3, P74)

The complex intersections of different aspects of identities – what is known as *intersectionality*[6] (Crenshaw, 1989) – and its impact in the classroom was brought up in several conversations. One of the female coaches of color recalled a time when a male

[5] There were often references to two following recent student-led protest movements in the conversations:

- *Rhodes Must Fall* began in March 2015 as a movement focused on the removal of the statue of Cecil John Rhodes, a key figure of British colonialism, from the University of Cape Town. It soon led to a wider movement for decolonizing education across South Africa, and gained support and inspired similar movements across the globe (Chaudhuri, 2016). Oxford university in UK faced similar demands for removal of Rhodes statue a year after and it continues until today (Race, 2021).
- *Fees Must Fall* movement began in October 2015 to halt increases in university fees. The movement was reignited in 2016 as the university fees were announced to increase by the South African Minister of Higher Education. Although the initial focus was on interrupting the rise in tuition fees, the movement demanded free and decolonized education for all (Kamanzi, 2016).

[6] The term was introduced by the law professor Kimberlé Crenshaw (1989) to show how individuals experience different levels of discrimination due to their intersectional identities (e.g. women of color). Intersectionality offers an analytical framework to understand how the combination of different aspects of social identities (e.g. race, gender, class, religion) create different experiences of privilege and discrimination.

older student would dismiss her authority, saying: “I know that there's certain things that I get challenged more with because of the color of my skin and because I'm a female.” (U11, P56)

When asked about potential challenges of having diverse teams, one of the coaches mentioned the role that race plays:

> Even if you have people that are classified as White and they consider themselves to be quite open and progressive, there's a level of unconsciousness that they even have. They don't realize how much space they take up and how much they expect people to just listen to them. I've seen that kind of thing where somebody will stop the whole process every single time because they're like, "No. You guys are doing it wrong." You'd find that kind of thing with the race issues. Then in that regard, you'll see either two types of responses from people that are not White. They'll either be very accommodating, because, socialization. Or they'll be very aggressive and annoyed. You can see those kinds of things. (U11, P34)

Some students however, had eye-opening experiences and could reflect on their own privilege as a result of working closely with students from completely different backgrounds:

> I think that when many people come into this university space, they think everyone is equal. They think everyone can relate to each other on many levels. What they don't understand is that many people, especially from other African countries, have had a completely different journey to get to this point, as they have. I think, through the sharing, these people learn a lot about, you might look the same as me, we might be in the same place but you send 80% of your salary back to your family at home and I get to keep all my salary. So just small things like that. I think that really, it's a privilege for people coming in to experience that kind of, sort of perspective. Because it's very easy to walk around and think, "Oh well, these people from under privileged or previously disadvantaged backgrounds are now fine because they're here with us". But their lives are still affected by the inequality that is supposedly not here. There's a hangover from that. There is still an inequality, which I think a lot of people come into this space and learn. Where having not come into the space they would

> think, all these black people they're at university, they're fine. (U3, P31)

Having an international student cohort added another layer of diversity, as more than half of the students were from other African countries or Europe. Most of the informants spoke positively about having international students who brought in different perspectives. Apart from learning DT, becoming more aware of issues around equity and social justice seemed to be an inevitable part of the international students' journey, as one program manager explained:

> I think for them [international students] it's a very steep learning curve, and I think most of the time during the first few weeks it's them who feel the most uncomfortable. Because there's all these complexities and issues and tensions that come to the surface that they haven't necessarily engaged with in the past, where South Africans have. So, I think that first sort of few weeks it's very intense. And I think they learn a lot about South Africa in that first month of the program. And then again from our students as well, it's just interesting to hear other perspectives that come from internationally. (U9, P58)

One of the coaches explained how the local students would on-board the international students about the issues and nuances of their context:

> So, I think that as a coach, that's not something that I do. The team does that. As somebody who might not necessarily be very familiar with the specific social context. The rest of the team would very quickly tell them, "You can't say that, or you can't speak about people like that," or "You can't ..." so that's quite nice, because there's always a mix of local people who are quite strongly opinionated. (U7, P36)

Although having international students was deemed positive by many informants, the dynamics between the international and local students varied depending on where the students came from and how much they could relate. In the following, I will show three examples of how the international students' relationship with the context affected the dynamics in the classroom.

One of the program managers talked about the attitude of some students coming from developed countries and their assumptions about South Africa:

> I think it's always interesting to observe the interaction between the international students and local students because there's always, especially when they're coming in for the first time, there's always that assumption that because you are coming from a developed world, you know better than people who are coming from a developing world. I don't know where that comes from, but one observes that often when the students are coming into the program for the first time. But from what I've observed last year is that over time, that sort of slowly disappears as people start realizing that, actually, these people might be different from me. They might be from a developing world, but it doesn't necessarily mean that they are less knowledgeable than I am. They know things that I do not know. (U1, P39)

Over time, the "power dynamic sort of subsides" as the program manager further explained. In contrast, the students from other African countries could often relate in a more meaningful way:

> Then obviously the people from other African countries, they can relate to a degree. Because obviously they understand what's going on in South Africa. They would mostly be Black as well, so they would have the experience of being Black in a place like South Africa and obviously, in their country there would be similar tensions or maybe worse scenarios that are kind of related. (U3, P37)

Sometimes, the local and international students could relate to each other through having experienced similar challenges, as one program manager explained:

> But what's really interesting as well, is you might have a student from China, and a student from Angola, and a student from South Africa who maybe have experienced some things very similarly. Whether we talk about access, for example, to information. They might have had different experiences but they've all had limitations to access. Some because of government bans on certain platforms, some because they couldn't afford the stuff, some because they just didn't learn about it, for example. But

> they can come together around those themes and share those experiences, and that's really useful. (U9, P58)

4.2.1.2 Educators' Qualification Beyond DT

At the d-school at UCT, coaches and program managers played a crucial role in creating a DT education that resonated with their students. Apart from having DT expertise, they had to be able to navigate the dynamics mentioned in the previous section. Thus, having a diverse coaching team that could relate to different experiences of their students was crucial, as one of the program managers emphasized:

> To make sure we have diversity in the coaching team, is very, very important, and that's gender diversity as well as cultural diversity. Professional diversity, yeah, absolutely as well. The diversity is not just with the students, but it's with the coaching team. (U5, P 27)

Throughout the conversations with different coaches their different lived-experiences and backgrounds became clear. Some of the coaches came from very disadvantaged backgrounds while others were much more privileged. The following quote from one of the Black South African coaches shows how their upbringing made them sensitive towards other marginalized groups:

> I mean it's funny thing to say and it seems vain or whatever, to say I feel like, it's something that comes naturally to me like, I would naturally notice if somebody's perspective or culture wasn't being respected to the degree that it should be and then try to bring their voice into the space. I would say very much the way I was raised. I might have been an asshole at very many points in my life, younger, but the one thing that my parents teach me is everybody is equal. Not in the way of rainbow nation kind of way, but in a way like if I had to say something that was maybe a bit derogatory or a bit like you're generalizing and things like that, that wasn't on. I couldn't do that. So, it became natural for me to not worry about certain characteristics of people that define them by many people's standards, if that makes sense. Yeah, I feel very lucky for that. It's something I thought was normal, but obviously coming into a space like the d-school even, you realize not everybody is able to do something like that, quite naturally. (U3, P49)

In addition, many coaches were aware of the issues around social justice and equity. The following quote is an example of such sensitivities, regarding political correctness and avoiding generalization:

> I mean this might be hard to explain to someone who's not from here, but like you have to be very, very sensitive, just in terms of what you say. What you say might not even represent how you feel or it might be sort of misinterpreted. But I think you have to be very careful, just in terms of what you say about women, or men, for instance, or people of different races. Because of the tension in South Africa, in general, at the moment. I mean there's a big movement toward obviously decolonization. Opinions that differ are very hard to bring into the space. Opinions that are sort of maybe not in line with the idea of decolonization are very hard to bring up, because I guess of just how strongly people actually feel towards this sort of thing, based on their own experience. Yeah generalizing about things like what women do or people of a certain class do. It's just not done, you don't bring that kind of thing up. Which is cool. I mean it's nice that people can be that sensitive, even though they might have a differing opinion. I know obviously the ideas that you can express your opinion or express whatever it is your opinion is. I mean I guess that's where the tension is, right. You should be able to say what you want but in the context of South Africa, there's very many things that you probably shouldn't say, if that makes sense. Maybe it's hard for me even to really grasp this because I would be on the side that believes that there are things that you shouldn't say. If that makes sense. (U3, P27)

Some informants recalled incidents of visiting instructors from other countries who lacked this awareness and sensitivity. One of the program managers explained how having exchanges in the beginning of their program led to mixed results:

> We had a lot of exchanges. We had a lot of people coming to assist us from Potsdam. That was great because we were starting something new and having those exchanges was enriching. But at the same time, the people who were on the receiving end, and I don't think we really took it into consideration when we were making those decisions, but now reflecting and engaging with students who were actually on the receiving end of those exchanges, one realizes that actually it was not the best decision we made because it became highly frustrating for the students

> that were part of the program. Because they often, 'cause it was every two weeks, we had new people coming in. And every time those people came, I don't think they had taken the time to understand the context or just to empower themselves so that they are aware of the dynamics in this context. So, the students would spend a lot of time briefing the new people. And as a result, based on their feedback, they felt that there was [a] lot of giving on their side. And receiving very little. (U1, P26)

One coach recalled an incident where in one of the coaches' trainings, the visiting educators framed a problematic challenge:

> So, for instance, an example that resonated with me is when we did our coaches training, one of the examples that they gave, the challenge they gave us for like the one-day Fast Forward was like: "Re-design the playground experience in a mixed neighborhood without using fences". For us, we were like, "This is a dodgy challenge, to say what is a mixed neighborhood?" What about a mixed? In South Africa saying a mixed neighborhood and speaking about fences is almost racist. So, you see, they obviously might not see how that lands in this context. We were like, this is quite an awkward challenge because in this context you're positioning the user as somebody who needs to use the playground but doesn't want interference from people who are maybe of a lower class or people who they see as dodgy. Whereas in our context, the user would be somebody who maybe sleeps in a playground because for us the idea would be to uplift that person and not to provide the person on the other side of the power relationship with what they need, if that makes sense. So that was one, because they were saying how does it land in context, I didn't really understand what they meant by that until they set that challenge and immediately our team was like, "this is a bit of a cringy challenge because there are some assumptions here." That like, a mixed neighborhood means like some people are dodgy or unsavory and other people need to be separated from them, where here, inclusion would be an ideal that is always on our minds. (U3, P70)

These two examples were presented to show how the educators' lack of sensitivity and awareness about the context they wish to teach in might negatively affect the dynamics with students and the learning experience in general. As one of the program managers advised:

> In the spirit of design thinking, I would suggest to anyone who goes to a different context that try to empower yourself with a little bit of knowledge about the context. This doesn't mean that you should be an expert, but at least have a little bit of knowledge about the nuances. (U1, P26)

4.2.1.3 Engagement with Stakeholders

Creating a DT education that was meaningful to the school's context meant considering a strong role for the communities and stakeholders in the problem-solving process. The need for including the communities that are affected by the design challenge throughout the DT process, especially when dealing with social challenges, was mentioned in several conversations.

The educators' concern about social justice issues informed their approach in engaging with other stakeholders. Many informants were concerned that teaching DT only to university students would perpetuate the exclusion of marginalized communities:

> Disciplines like design were always considered to be exclusive. And university itself, has always been considered an exclusive experience 'cause you can only go to university if you can afford or your parents can afford it. If your parents can't afford, then you can't go to university. (U1, P22)

Some were concerned that offering DT to university students perpetuates the notion that knowledge is exclusive to experts in higher education, therefore excluding socially and educationally disadvantaged groups from the design process. There was a sense of responsibility to take DT education outside of the university space, considering that South Africa has one of the most unequal education systems in the world (Amnesty International, 2020). The readers may consider Leibowitz and Bozalek (2014) for a more comprehensive look into the education disparities in South Africa.

In discussing future directions for the school, one of the program managers expressed their wish for "capacity building, not just within our own students, but with the people we engage with" (U9, P50). This meant, not only to include the communities they wish to serve in the DT process, but also to engage with the project partners beyond handing over a set of possible solutions at the end of the semester.

The school's experiment with their first Advanced Program was an example of their efforts towards sharing their learning experience with others. There were two teams in the Advanced Program that only worked at the project partner's location. Each team consisted of three students and two employees from the project partner's organization. The employees did not have prior experience and knowledge of DT. The students were responsible for onboarding their team members from the organization and passing their DT knowledge onto them. The educators encouraged the students to have "empathy for their team members" (U1, P18) who had no DT experience and to make sure they were not left behind. In other words, the educators tried to both make their students more privilege-cognizant regarding their access to DT education and to education at large and to instill a sense of responsibility among them.

4.2.1.4 Adaptive Curriculum Design

The first four weeks of the semester had a flexible structure, as one program manager explained: "It's very messy upfront, but it's also very valuable. And then the eight week becomes more structured" (U9, P26). The reason behind this choice was two folded: Allowing time and space to deal with potential tensions to surface early on, and leaving space for students' development.

Often introductory programs to DT have a very structured beginning where every minute is planned, students are encouraged to try things out instead of discussing, and they are led through various activities in a short amount of time. At UCT, program managers adopted a more flexible structure in the beginning of the program and left more room for discussions. There were many opportunities for the students to discuss different topics with the entire cohort.

As mentioned in the previous sections, the school had a holistic view on diversity. Therefore, the program managers left space during the first weeks of the program for the students to share and relate to different aspects of their identity and backgrounds:

> We were seeing certain tensions come to the surface later on in the process. So yeah, that I thought could have been dealt with much earlier had they been given that space. And so, it's a way to mitigate certain tensions upfront, and it's also a way for them to experience those tensions and learn from them earlier. So, there are definitely clashes, we can almost be guaranteed of that

> within this first month. But it's about saying okay this has happened, now what? And what would you do differently? And so, when they go into this eight-week-challenge they'll start with a lot of depth already. And so, it's a way of doing that, but mitigating those tensions upfront. (U9, P30)

The school did not shy away from discussing topics that some might deem controversial. In the second week of the program, Professor Simphiwe Sesanti, Associate Professor at University of South Africa (UNISA) was invited to speak on "Cultural Diversity". One of the topics was the legacy of apartheid and the need for a decolonized and Afrocentric education in South Africa and Africa at large. This made some people uncomfortable and led to a heated discussion.

The program managers anticipated conflicts and tensions to be inevitable parts of the learning experience and would warn the students upfront about them:

> So, we've taken a lot of the learnings and actually been introducing them to students upfront, to say these are the types of clashes you will have. You can expect to disagree with people, feel uncomfortable, and have different perspectives around a challenge but you need to learn to move past it. (U9, P38)

By allowing the space for discussions early on, not only did the student cohort get to know each other better, but also many of the potential conflicts that could appear in the 8-week-project were already dealt with.

The program managers consciously avoided taking the "expert position" in the beginning of the program and did not present in-depth content on the methodology, allowing the students to form their own understanding of DT. As one of the program managers explained: "We want them to try and give their perspective of [DT] before we again tell them this is what design thinking is. So, we won't go deep." (U9, P22). In addition, this approach allowed the program managers to get a better understanding of each cohort:

> We want them to form their own opinions about what it could be, and we found that in discussions with them afterwards we learn a lot about what it is. Whereas I think if we just told, we'd get the same sort of responses each time. Whereas each cohort of students is very different. And they also have very different

> backgrounds. Some of them have done interviews before, they're from a humanities background and they've done a lot of ethnographic work, others have only worked with big data. So, we want them to have conversations within a team, sort of saying how are we going to go out and interview people, and then saying why, and they'll ask us why and we'll give them a response to say. (U9, P24)

Learning about the students during the first weeks helped the program managers to not only identify their students' strengths, but also their needs regarding certain DT methods and mindsets. As a result, they could adapt the content for the rest of the semester accordingly. Finally, this approach helped the program managers to better prepare the student teams for the 8-week-projects.

4.2.1.5 Inclusive Approach to Teaching DT

Many interviewees wished for a more inclusive approach in teaching DT, specifically to make it accessible to those outside of the university, as one program manager explained: "I think as much of an inclusive classroom as we have, I don't think it is as inclusive as it could be. I mean at the end of the day we're working with postgraduate students." (U9, P56)

To expand their outreach, the school collaborated with the Raymond Ackerman Academy of Entrepreneurial Development to improve access to those who have not been able to get into university "due to financial constraints or other circumstances" (ackermanacademy.co.za, n.d.). One of the program managers described how valuable this experience was for them:

> What was really exciting about working with those students is just to say "Look, if you go out and speak to people, you will learn a lot and you can begin to build on something." And so, for them it was opening their eyes up to the fact that they don't have to go to, for example [to] university. They don't have to rely on the existing systems, but they can go out and produce things without that. And they were. And that's great. (U9, P46)

Some informants raised concerns about the current positioning of DT education at the university. One of the coaches mentioned that the real potential of DT is to empower communities to solve their own problems, rather than having university

students from outside trying to tackle their issues. Some felt uncomfortable with encouraging "experts" who are not familiar with the realities of living in disadvantaged communities come up with solutions:

> What is the role of sort of a design thinker or design thinking in a community like that, an underprivileged community where they don't necessarily want people from the outside to come in and tell them what their problems are and tell them they need help. I think that's a space in South Africa, that it [DT] needs to land. It's very important to get it right in that space, where instead of you offering people solutions, you need to offer them tools to build their own solutions. (U3, P68)

In addition, some informants were worried that keeping DT education within university would maintain "levels of privilege and access" that historically existed and in general fail to tackle the social challenges that the country faces. One of the coaches criticized the current team compositions in DT and advocated for including people who were affected by the design challenge in the teams:

> If [the d-school] really want to make a difference, so let's say we were looking at how to address issues of economic exclusion within a particular community, it would be that yes, you get like ... I mean it's almost like how hackathons work. It's you get diverse groups of people. But primarily the major composition of that is the grouping of people that are affected by that [the challenge] the most. For me, as a social justice activist, that's how I see change happening. Inclusive innovation for me is that you can't come up with the solutions without the people. (U11, P10)

Some informants criticized DT's emphasis on designing *for* people, rather than empowering them to solve their own challenges - especially in dealing with social issues, calling the methodology "extractive" and "voyeuristic". The school's founding director shared this view as well:

> It's still a bit of a design *for* methodology where we have a team of people and *we* go into an environment and *we* observe the environment and then *we* come out and *we* make sense of it and *we* come up with a few ideas, build a prototype, *we* go back into the environment and *we* test it and *we* observe and *we* come back

> again and *we* do ... So, we're designing *for* this environment. In this country, we need to get more into a design *with* environment, where we go into this environment and we observe with the people in this environment and we co-create with the people in this environment and we facilitate. (U5, P33)

The school's first Advanced Program could be seen as an experiment towards designing *with* people: An attempt to include other stakeholders in the design team and throughout the problem-solving process. The founding director explained that training individuals who could facilitate the process of co-designing with communities was an important step towards their ideals:

> When we built the d-school we went back to more of a designing *for* approach because that's what Potsdam and Stanford are modeled on and that's what our foundation course is modeled on, but I think it's a very important foundation to have because I think to get into the designing *with*, you need to do the designing *for* first. I think you need the skills of the designing *for*, before you go into the designing *with*, because [for] the designing *with*, you've got to facilitate a design process with people that aren't designers, that are very close to the problem, that have never spoken to each other, have nothing necessarily in common, and you need good skills for that. (U5, P39)

4.2.1.6 Rethinking Empathy

Some informants questioned the effectiveness of the classic DT process – that starts with *Empathize* and conducting user-research – for tackling social challenges. There was a strong emphasis on the Empathize phase and empathy in general. However, the *Empathize* phase entailed activities beyond user-research. The very first step of the process at the d-school at UCT was to build what they called "internal empathy". This meant creating a space for the students to share different aspects of their identities and to gain an understanding of each other's experiences:

> So, I think often empathy is seen as this outward looking thing, and this isn't any comment on the Potsdam model just in general, a lot of peoples' understanding of design thinking is that empathy is something that we go and do, out there. And we've drastically realized and very quickly realized that we need, empathy was something that happened, we needed it to focus on internally

> first, and so the first week is really about building relationships, building trust, building unity around new experiences, showing that we've got this really rich group of students in the same room who might view the world very differently and exposing those different views to the others just to kind of show how rich the team actually is and valuing those different opinions. (U9, P20)

Unlike the dominant discourse in DT that only refers to empathy in relation to the end users, here empathy began within the student cohort. When asked about the reason behind their strong emphasis on empathy, one of the program managers responded:

> That is because South Africa was divided according to racial lines and social classes. And there was a lot of segregation for a very long time. And people of certain races were always viewed as lesser beings who hold no valuable knowledge. And for a very long time, White people considered themselves as most superior race to other races, to other people in South Africa. And as a result of that ... even though apartheid ended in 1994, but people were not taught that whatever you learned to believe and understand about other races is actually not the case. Even academic institutions were also only accessible to certain people who could afford. (U1, P37)

The first four weeks of the program were designed around building *internal empathy*. In the first week, students from both Foundation and Advanced Programs came together at the d-school space. They would get to know each other and learn about their different backgrounds through various warm-ups and games, while applying some of the DT methods (e.g. interviewing each other). The second week of the Foundation Program marked the beginning of the 3-week-projects, where the students embarked on their very first DT project. However, apart from their project work, there were several activities and events around the topic of empathy. For instance, on the second week of the program, the school planned a dark-dining "Empathy Lunch" at a restaurant run by blind and visually impaired staff. The coaches and students from both programs attended the event where they ate lunch in complete darkness with the help of the restaurant staff. Afterwards the staff shared their perspectives and experiences about living in a world designed for able-bodied people and answered questions from the students. Later that day, the industrial designer and researcher Professor Mugendi K.

M'Rithaa was invited to give a talk on empathy. This offered another chance for the students to reflect on their lunch experience and discuss these topics further.

Gaining a common understanding about the design challenge and discussing potential stakeholders and users is often the very first step of the project work for design teams. However, some informants pointed out the need for reflecting on one's potential biases and prejudices before embarking on this step, as one program manager explained:

> One example of something that we had to unpack and sort of understand for ourselves as well is the Understand phase of design thinking. Where it's about going out and understanding the challenge itself first, and then going out to understand how people's experiences or gaining empathy for other people and all of that. But in the context of South Africa where there is a lot of diversity, one needs to spend a lot of time in terms of the understanding of oneself and their own prejudices that they bring into the team space. And once one has understood their own differences and prejudices that they bring, then they are able to really gain empathy for other people in the team first, before going out to gain empathy for others. (U1, P31)

The program manager further added that discussions about the context of the challenge was another aspect that needed to be considered in the *Empathize* phase. Some informants were concerned about how DT refers to empathy as something easily achievable for everyone in any context:

> It's very difficult for someone who's always been privileged to understand responses based on pain. That pain comes from your experience of life. You don't need to look at the context or understand what is going on, you can relate to very many situations. But then for someone who's always been privileged they'll be like, "This has nothing to do with race." But if he's someone who's Black and who's coming from a different upbringing, you understand maybe more acutely how everything has to do with race. Because in your experience, everything has been defined [by] race. These kinds of things we see in the space quite often, especially, like I said, when the challenge is in a complex space like that. I mean some people are able to empathize, but again, I don't know how or whether even in our

> space, that is when we push these ideals that you should listen and be open to everybody, people still really, really struggle with those kinds of tensions. Where they are called on the wrong side of history, let's say. (U3, P33)

The following two examples show how the gap between the lived-experiences of individuals and potential users might make gaining empathy difficult:

> There was one sort of 60-year-old guy last time, he kind of ruined the whole thing for his group, because he could not empathize with someone who he saw as a criminal. So, the challenge was around *Shebeens*[7], which are illegal, sort of bottle stores, so people who sell liquor without a license in like the townships[8]. But the issue is that you can't have a legal business in many of those areas because of what the areas are designated for. It's impossible to kind of change that and you have so few resources that it's impossible to move. So, the idea was how can we work around this issue. He couldn't empathize with these people who we saw as running businesses that were only illegal because of the lack of support. He couldn't see them as legitimate entities. (U3, P31)

On the contrary, the coach talked about those students who came from similar backgrounds and could easily empathize with the *Shebeen* owners:

> Like I said, working on the *Shebeens*, some people come from townships where their parents and they themselves hang out in these areas so it's easy for them to understand why it's a valid structure. That the problem is actually the laws, not that entity. Those people aren't criminal, the laws are criminalizing them where somebody who's, like I said, 60 years old and White and he can walk down the road and drink at a bar would never understand that anyone really needs ...they wouldn't understand why it's unfair that they can walk down the road and drink in a bar and someone who lives in a township can't. (U3, P63)

[7] Shebeens can be seen as alternative to bars and pubs. Often located in townships, they are an important part of the social scene among the community (Wikimedia Foundation Inc., n.d.-b).

[8] The term originally emerged to refer to non-White urban areas during apartheid (Jürgens et al., 2013).

The second example is about a project that dealt with student loans. The following quote shows how some privileged students failed to understand others' realities and perspectives, and as a result, could not empathize with them:

> Oh, we did one [project] about people paying back student loans. Then something that many people don't understand is, as a Black educated person, most of your money in your first years of working will go back to your family. So, it's very hard for you to pay back a student loan. Whereas people on the other side of that sort of inequality are like, think people who don't pay back their student loans are like bad people, you know what I mean? I think it's all stuff that can be overcome by just gaining a deeper understanding of these people and the context. (U3, P64)

4.2.1.7 Re-examining DT Methods

At the d-school at UCT, the educators adjusted some of the DT methods in order to make them better suited to their context. Many felt uncomfortable with applying methods of user-research (e.g. interviewing and observation) in marginalized communities, uncovering their problems and pain-points and going back to the d-school to continue the process without them. One of the program managers spoke on the importance of representation and inclusion:

> We're finding more and more students don't feel comfortable kind of helicoptering in and out of places … And so that's something that we try to engage with, is that blend I guess between that participatory design and design thinking. That comes from, where it has been about let's understand users better or customers better. Where, let's understand people better, and also give them a voice in the process. Not just use them to generate insights. I think it's still this extraction methodology in some ways, and I think what a lot of students here are feeling is that they don't necessarily feel comfortable going in and just interviewing people, and then using that somewhere else. (U9, P39)

Figure 15: A project team conducting a field interview around the d-school at UCT, taken from (d-school at UCT, 2019).

In discussing ethical ways to engage with disadvantaged communities, the program managers encouraged the students to move away from "need finding" – often phrased as one of the objectives of the *Empathize* phase – towards taking an "appreciative inquiry approach":

> And it's also about taking a more appreciative approach than just identifying needs. Because what we've found is when students, often in research they'll go in and say "Okay what are all the problems you have? Or what are the issues you have?" They leave, and people are just left exposed. So, these are all our problems, it doesn't feel good. So, we want to say it's more of an appreciative inquiry approach to engagement. To say "Okay what are you doing well? What is working?" And then building on that, as opposed to saying "What isn't?" What isn't will come out in the process. But it's not to focus on the negative, it's to focus on the positive and then build up. So even if you leave and you haven't managed to hand over anything, you're not leaving people thinking everything is bad or that these are all the problems we have, but rather we can do this, and we do do [*sic*] this, and that's become really important as well. (U9, P50)

The program managers also encouraged the students to be cognizant of the power-imbalances between the design team and the communities they engaged with. As many important decisions in DT are made by designers, the power balance is tilted towards the design team, wishing to bring intentional change (Gray & Boling, 2018; Irani, Vertesi, et al., 2010; Iskander, 2018). Being aware of the power imbalance helps design

teams to approach field research with more sensitivity, as one of the program managers explained:

> And that's also depending on who students are talking to. So, I guess the more kind of generally excluded the community, the more sensitive that becomes. Whereas if they're just talking to middle age, fairly wealthy people, it's fine to ask what the issues are. (U9, P52)

Many informants wished for moving towards participatory design methods which could help equalize this power-imbalance and involve those affected by the problem (Gray & Boling, 2018).

In discussing common DT methods, some educators questioned the compatibility of the *persona* method. *Persona* represents a "hypothetical archetype of real users" (Pruitt & Adlin, 2006). However, some informants spoke about students' discomfort with using *personas*, as the founding director explained: "[the students] don't like to box somebody into a *persona*". One of the program managers shared their concern about the method:

> I mean one of the things that we had to deal with, for example [is] representation. So, it's a very complex topic in South Africa, on whose behalf you can speak. So too often people have been excluded from having been given a voice, and so lots of services and decisions have been made on behalf of people but without engaging with them. And so, we don't do *personas* anymore, because students were finding offense with it. That it was too much of a generalization of an entire group of people, and that they didn't feel like they had the right to speak on those persons behalf. And so, we quickly realized *personas* actually don't have a place here. We want to speak to specific people, and maybe we can refer to those people. (U9, P50)

The program managers were exploring better suited alternatives for *persona*. One approach was to stay close to the information retrieved from the individuals they met, instead of creating a semi-fictional character:

> So, we don't use *personas* because a lot of people in our context are not comfortable with using *personas*. For them, design

> thinking becomes even more meaningful if you are designing for a real person that they have engaged with, than making up a fictional person. (U1, P41)

Another approach was called *Character Class*, which encouraged the students to go broad and create a character based on different individuals, instead of a detailed semi-fictional character:

> Depending on the program that we are running, if it's a program where the challenge is much more focused and the user group that they engaged with is of similar individuals, then you take the person. But if it's a wider, more diverse group, then you take characteristics from the diverse individuals to create a *Character Class*. (U1, P43)

4.2.1.8 Language of Instruction

Language naturally plays a significant part in teaching DT. Although English was the language of instruction, South Africa is a multilingual country with 11 official languages (Alexander, 2018). The educators tried to simplify the language they used to introduce new methods, to find better suited alternatives for some of the DT jargons, and to make sure that the instructions were clear.

When introducing new methods to the students, the program managers highlighted the intended outcome of the method and put less emphasis on the original name of the method:

> There're specific words that don't make sense in certain cultures. For example, stuff like *brainstorming,* for example if you translate it into I think in Xhosa, it translates as almost like headache or something, I can't remember the exact thing. But it's the opposite of what you're wanting. So, if you look at the literal translation, it doesn't make sense. And so, we had to unpack some of the terms I think to, more around what the outcome is, than what it is. So, we thought instead of saying brainstorm we'll say, like ideation is a phase. We'll talk about generating ideas. (U9, P48)

The educators did not persist on using the original names of the DT methods and took the liberty to change them into something that made more sense to their learners. For instance, they renamed the *mind-map* method into *mind-wash*, since it better

conveyed the act of getting rid of one's associations about the DT challenge, as one program manager explained.

Figure 16: An example of using the mindwash method to share team member's associations with the design challenge.

Simplifying the language was a strategy they applied to make sure that field-specific terms would not exclude those who are new to it. The school's experience with teaching DT in different African countries also contributed to their awareness about the important role of language in delivering content:

> So, we just simplify the language, we find so often the culture related to a field can be quite exclusionary. And Design Thinking is meant to be very inclusive. It's just about how we simplify that language. And that's something we've learned, especially teaching within different spaces within South Africa and Africa. For example, this last trip to Morocco, where students speak predominantly Arabic or French, and English is their third language. And you're trying to talk about ideation and all these new words, that you spend so much time explaining them. But just say this is what the outcome is going to be, and so it's about simplifying the language of design, I think. It's been very much important to just how we frame things differently. (U9, P48)

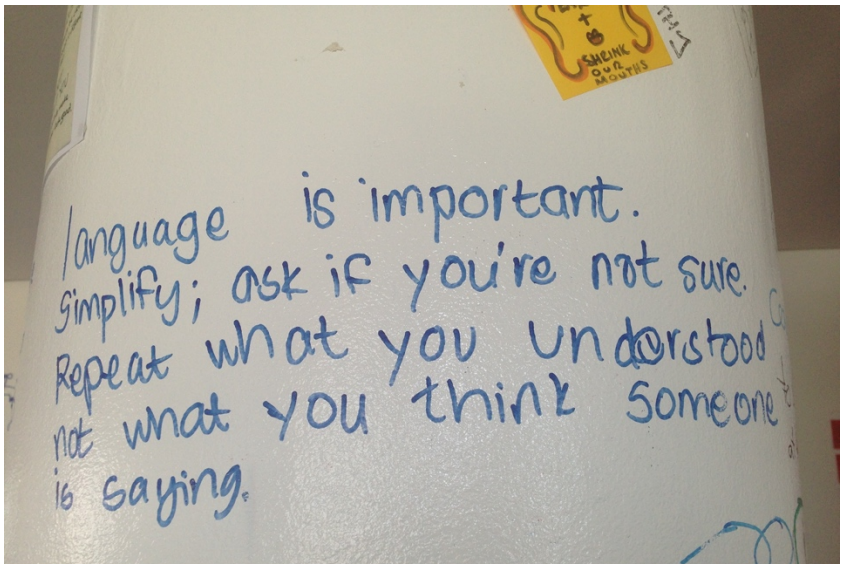

Figure 17: Writing on a column at the d-school at UCT about the importance of language.

Finally, paying attention to the language was an ongoing effort in their multilingual context, as the school's founding director explained:

> Perhaps we shouldn't be teaching design thinking in English…My understanding is in the Xhosa language, there is no word for design, so when you talk about Design Thinking it's like [blank] thinking. It's like there is no word for it, so how do you change that? But yet there is design. They understand the concept of design but there may not be the word design, so the word Design Thinking is a meaningless thing because the word design doesn't exist. So, it's those challenges. I think everybody understands the process we're trying to follow to solve a problem, but the brand that it's being called is maybe not the right brand. We haven't really addressed that yet, but it's just things which we're noticing emerging. (U5, P27)

4.2.1.9 Warm-ups: More than Energizers

Warm-ups have been a popular part of the DT education. Often there is a dedicated time in the schedule for warm-ups. "Warm-ups are short, playful exercises preceding work or learning sessions" (Von Schmieden & Meinel, 2019). In their study about the two pioneering DT schools in Stanford and Potsdam, Jobst et al. (2012) point out several advantages of warm-ups. They explain that warm-ups contribute to students' self-efficacy and increase students' motivation. Although the goal of warm-ups is not necessarily relaxation, they contribute to a decrease of stress for the students and put them in the right state of mind for the activities that follow. Warm-ups often create a

team spirit; what Jobst et al. (2012) call "we-feeling". Finally, since warm-ups are often playful and simple, they can be carried out by all students and give them a feeling of success early on in the day. In both schools at Stanford and Potsdam, each day starts with a warm-up (Jobst et al., 2012). The schools in Cape Town and Kuala Lumpur also started their days with warm-ups.

Figure 18: A warm-up at the d-school at UCT, taken from (d-school at UCT, 2016)

Avoiding inappropriate warm-ups and being mindful of cultural sensitivities in choosing warm-ups were two aspects that were highlighted in the interviews. One informant recalled a visiting coach introducing a warm-up that was playful and energizing, but deemed inappropriate to some:

> Then obviously in warmups, I think, we did stuff with [coach's name] where he wants your punishment to be like running around the room saying, 'I'm so sexy' and stuff like that. People didn't really buy into that. I mean I don't think that's really got to do with cultural upbringing, but I do think people might think it's inappropriate. I mean from again certain religious upbringings where modesty is an ideal, you're not going to do stuff like that. (U3, P66)

The program managers designed warm-ups that would help them celebrate different types of diversity, especially during the first weeks of the program where the emphasis was on building *internal empathy*. As one of the program managers explained: "We have a lot of activities that we do, that we came up with, to help teams understand the differences." (U1, P33). One of the program managers shared a warm-up that they had designed for this purpose:

> So, for example, one of the activities that we do in our first week is, it's a very simple activity but it has a very rich outcome, is to take five different objects and put them on the tables, five tables, and then students sit around each of those so there's a team of six or so around each object, and they'll share a story related to that object. So, for example, I think one of the most powerful things that we've seen is just by putting a simple brick on the table. We've seen stories emerge of bricks as a tool for building, or bricks as a tool for destruction, depending on how people relate [to] the stories. Some people say "We built our house using bricks and it was really nice." And people are saying "I remember during a protest in South Africa, we used to throw half bricks." And you get this range of stories, and perspectives, and meaning. That is extremely valuable for students to see, the different perspectives that people have and the different stories. (U9, P60)

This warm-up encouraged the students to share their backgrounds, shed light on their different experiences, and helped the cohort to get to know each other better.

4.2.1.10 Space is More Than Physical

The informants also talked about the role of the learning environment for their DT education. Some were concerned about over-emphasizing the physical attributes, as a program manager explained:

> We're always talking about the importance of people, process, and place. And place in terms of furniture, and what we need, and what have you. And this is what we want, we want vertical space, and we want this. And then we had a student who was in a wheelchair and all of that went to shit. Because now this person has as much value to offer, if not more than a lot of students in terms of their experiences and what have you, but they can't engage with the space. And so how do we adapt space to people's needs as well? And the typical kind of d.thinking space doesn't cater to those. (U9, P42)

Another aspect that informed the school's view on the role of physical space in DT education was lack of resources. The following quote from one of the program managers shows how working with limited resources led to questioning the prevailing emphasis on well-designed and exclusive spaces for DT:

> Work within Africa that we've done a lot of, we've had to work with very little. So, space, for us, has become far more of a philosophical place than a physical place. Which means we have certain norms and values, and for us that is the space that we want. But not physical space. So, we work with just that we can work in a bare room on a floor, and maybe some more space. (U9, P42)

Lack of space was one of the reasons for running the Advanced Program at the project partner's space. As a result, the students learned how to work on a DT project outside of the well-equipped space of d-school and in a setting that was closer to the real world.

Figure 19: The team spaces at the d-school at UCT.

As mentioned in the previous sections, having a more inclusive approach in teaching DT was another reason for running the Advanced Program outside of the d-school space. The educators worried that if learning DT is only confined to a dedicated space within the university, it might exclude those without access to university:

> They are postgraduate students. And therefore, they have this opportunity to take a design thinking course as well. But when they leave this environment, there's people out there, there's a lot of people in South Africa who don't have the option to go to university. But they get employed into organizations as well. And so, it's about opening design thinking and making it more inclusive. Because the Foundation Program is purely for

> postgraduate students who are studying at the University of Cape Town. And the Advanced Program is the same… But then they are partnered with people within the organization. And those people, some of them, don't have postgraduate degrees. (U1, P22)

As a result, in addition to receiving a set of tested ideas, the project partner was part of the problem-solving process and learned the methodology along the way. Overall, the role of physical space was deemed less important: "Where we do design thinking isn't as important as to how we're thinking." (U9, P42)

4.2.1.11 Summary

Besides teaching DT and its methods, the faculty encouraged the students to adopt a critical lens and have discussions about privilege, oppression, and the power dynamics underlying design. Equity and social justice awareness informed many of their adaptation practices. The school emphasized diversity beyond educational disciplines, which brought a variety of different perspectives to the table and added to the depth of the discussions and opportunities for empathy building among students.

The educator's qualifications outside of DT expertise mattered in creating a learning experience that resonated with their context. Considering the socio-political history of South Africa, coaches' ability to navigate potential tensions played an important role: Different world-views might clash, controversial topics might arise, even individuals' understanding of the design challenge and their potential users – who should they empathize with? – might differ. These tensions required both great facilitation skills as well as contextual sensitivities.

Interviewees wished for widening access to DT beyond university students. The school aspired to include outside stakeholders (e.g. project partners and communities) more throughout the problem-solving process - designing *with* people, rather than *for*. This was manifested in their very first Advanced Program, which ran entirely at the project partner's location and included both UCT students and employees from the partner's organization.

Many were concerned about the compatibility of the current DT process in dealing with social challenges, since it neglects the power-imbalance between the design teams

and communities they engage with. In exploring how to meaningfully and ethically engage with disadvantaged communities during the research phase of the project, the school encouraged the students to take an "appreciative inquiry approach" rather than focus on need finding.

The school had an adaptive approach in designing and implementing the curriculum. The program managers did not position themselves as "experts" and avoided presenting in-depth content on DT during the first weeks. This allowed more room for discussions and for the students to form their own understanding of DT. In addition, the faculty could learn more about each cohort's needs and adapt the content of the 8-week-project and teams accordingly. Finally, reducing lectures left space for potential disagreements to surface and be addressed early.

The first phase of the DT process, the *Empathize* phase, was considered the most important phase. Instead of viewing empathy as something to gain by engaging with potential users, the UCT team started the process with *internal empathy*, gaining empathy among the student cohort. Whether through warm-ups, learning activities, discussions, events or talks by guest speakers, the faculty tried to help the students reflect on their own privilege, understand each other's perspectives, and as a result gain more empathy for one another.

Language played an important role considering the multilingual context of South Africa. The program managers kept the language clear and when introducing new methods, highlighted the intended outcome instead of focusing on the names of the methods (e.g. generating ideas instead of ideation). In addition, they avoided using jargons and field-specific terms that might be confusing to some.

Finally, although typical DT artefacts such as movable furniture, whiteboards and sticky notes could be seen at the school, there was less emphasis on the physical space. In fact, some informants worried that associating DT education with specific locations such as universities may be exclusionary and viewed the DT space as more "philosophical" rather than physical.

4.2.2 Genovasi

Cultural and religious sensitivities as well as learners' prior educational experiences influenced the school's adaptation strategies. Especially the impact of the dominant education system was highlighted in almost every interview. Many of the adaptation practices aimed at undoing the impact of learners' socialization in a teacher-centered and test-based education and gradually introducing them to a new way of learning and problem-solving.

4.2.2.1 Educators as Role Models

DT educators played an important role in creating a learning experience that resonated with their context. Many informants talked about the stark difference between DT education and learners' prior education experience with its focus on rote-learning [9] and accumulating knowledge through memorizing facts. Apart from the challenges of learning a new methodology, the participants were also experiencing a completely new way of learning for the very first time. Understandably, they had some doubts and hesitations, such as fear of making mistakes, not knowing what was expected from them, or feeling overwhelmed by the ambiguity of DT.

Most of the coaches and program managers had been through a similar education system and were also Genovasi alumni. Therefore, they could relate to the participants' concerns, as they had been through a similar experience themselves. Remembering their own education background, one of the coaches explained how they understood their participants' struggles with learning DT in the beginning of the program:

> I can say this from personal experience because I have been through both government learnings, government school and also private schools who have a more international experience. For the government sector, I will start to memorize, regurgitate and just be a part of everyone. I wasn't encouraged to critically think. That was only in university. In government school, the way to survive is to remember what the teacher teaches you from A to Z and then replicate exactly in the exams. So rote learning was how a lot of us were trained in. Then having that kind of different exposure, I spent a few years in government school and then a

[9] A memorizing technique that is based on repetition. (Wikimedia Foundation Inc., n.d.-a)

> few years in private school. There's no wonder that when I meet PTD cadets or people in government, they have a certain way of thinking because that's how they've been trained. (G2, P15)

Moreover, educators tried to act as role models, showing the participants that they could learn and practice DT too. One coach explained how important it is to constantly remind their learners of their common backgrounds, saying: "I'm just like you, right? I grew up [here]… I'm a typical Malaysian, alright? I went to the national school, I went through this program, basically I experienced what a Malaysian could experience as a kid." (G3, P90)

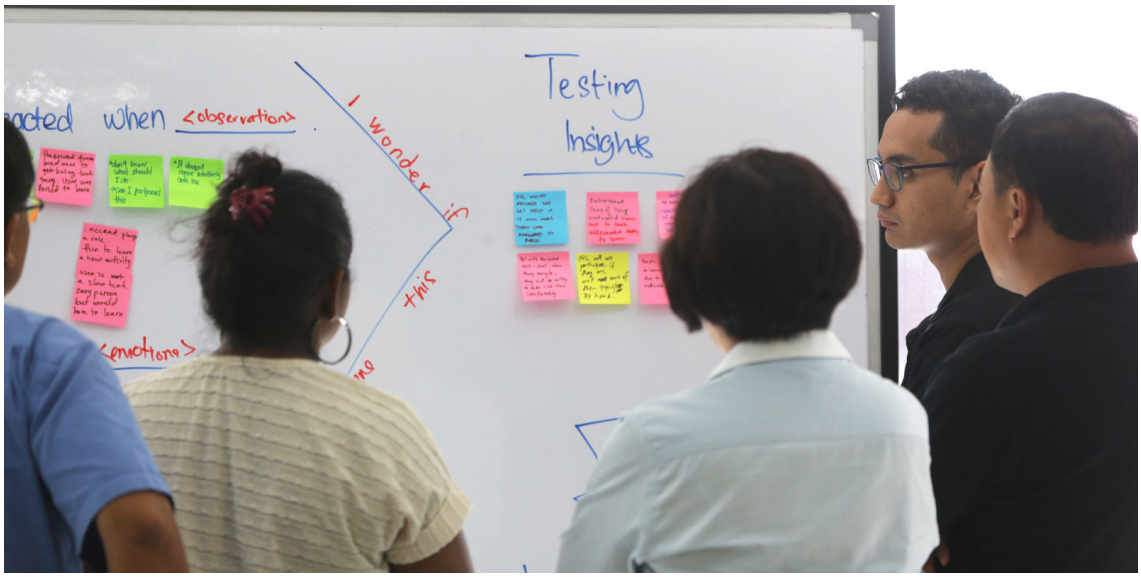

Figure 20: A coach at Genovasi working with their team, taken from (dschoolmalaysia.com, 2019)

Traditionally, there is a strong hierarchy between the students and teachers in Malaysia, where the teacher is seen as a figure with unchallenged authority (Tee et al., 2018). The participants initially expected a similar role from the DT educators. Thus, the coaches and program managers would try to break this image and establish their new roles:

> They are in a class mode. They think in classroom, we are supposed to listen to the teacher. I try to break that. We are all equal. We are all the same. I'm you. You are me. I'm not here to tell you what you should do. I'm here to guide you through this process and you decide everything. I'm just here to help. (G2, P67)

As one of the program managers explained, the participants perceived their instructions as the only "correct" way:

> In the Asian context, what I also notice is there's a high regard for the master. Meaning, how you are teaching them, they see that as the ruler, as the standard. Deviating from the standard in the Asian culture is seen as a no-no. So sometimes it pains me also to see how some of the participants take what we have to teach to them quite literally rather than seeing the bigger picture behind why it is, what kind of purpose it's for, and what objective it is achieving, and I can use different methods to achieve the same thing. This is actually a common message that I share to each and everyone one of my class, that all the tools and techniques that we share, it is not comprehensive. It is not just exclusively Design Thinking. There are many ways of achieving the same result. There are different bridges that you can cross, meaning, it's just like how you take different modes of vehicle to get from "A" to "B". (G8, P145)

The local educators had an implicit knowledge of their context and its cultural norms: Social hierarchies regarding position and age play an important role in Malaysia (Kennedy, 2002). Therefore, educators needed to establish flat hierarchies required for DT work, as one program manager explained:

> We inform them [the participants] from the beginning that there are no titles when you come into Genovasi. Because in Malaysia we have a lot of titles, kind of like "sir" and "Lord", we have those that we call "Dato". So, when they come in we tell them, "Okay we will forget your titles, let's just have your name on the name tag", and even that's quite a big thing, you know? (G9, P39)

Moreover, the young coaches needed to consider the hierarchies of age in their facilitation. A young female program manager described their strategy in dealing with this issue:

> Another thing is [that] age hierarchies play a big role, so for example, if someone is older than you, even by five years, you're expected to show them some sort of respect and not ask them to do stuff. So, for me, because I'm young and I look young, I've had to overcome that by showing a certain kind of personality.

> Like, I'm the kind of person who's really sassy and I don't care if you get offended. So, I have to start off with that personality so that they know that when I ask them, like older participants that's either in their mid-thirties or even forties, then they know that I'm not being rude, that it's my personality, like asking you to do stuff. So that's something that I had to prep myself with. (G9, P37)

The educators coming from different ethnicities and backgrounds, recognized and responded to social and cultural cues that are often subtle and non-verbal. They understood different religious requirements and interacted with individuals depending on their religious preferences. When asked how they navigated different levels of religiosity, many informants mentioned that it came natural to them. They talked about having their own creative ways to make sure that nothing – not even religious obligations – would interfere with the participants' learning:

> Some Malay Muslim men find it very difficult to approach a lady and ask, and vice versa. Just because culturally, they are like, "Oh we're not supposed to be too friendly with the opposite sex." When it comes to those situations, I try to pair them up with people who wouldn't, just to have a different mix. Because there shouldn't be an excuse why you shouldn't go out there and empathize with that client. I respect your beliefs and your discomfort in approaching people of the opposite sex, but know that that's not our intention to make you uncomfortable. There is a bigger learning there. You wouldn't know the perspective of a woman if you don't talk to her. You won't know perspective of men if you don't talk to them. I try to manage that by pairing them up with people who are more okay in those situations than them. I don't exclude them at all. I try to find other ways to fit them into the process, to the program. (G2, P 69)

The educators were attentive to the non-verbal aspects of communication such as body language, eye contact –or lack thereof – in their interactions with participants. For instance, a female coach described how they noticed a participant was avoiding eye-contact with her, realizing that the participant might be very religious and uncomfortable with a female coach. The coach asked her male colleague to step in and help, explaining: "I think he's uncomfortable. I get all these clues he's not looking at me and then, I know he's not being rude. It's just his belief." (G2, P75)

4.2.2.2 Instilling DT Mindsets

The school had a strong emphasis on personal transformation as a result of their programs. Their focus was mainly on creating "innovators" rather than "innovation", as one of the program managers explained:

> So, what HPI brought us was like a very clean, kind of well-chiseled kind of version of design thinking and templates and roadmaps and the coaching tools and coach training and assessments. All of that was quite good. But in that, at the time, we didn't know it, in the beginning we didn't know it. But after Stanford came the first time and did the Executive Bootcamp, we could clearly see a difference between the two schools in terms of what we received in coaching. We kind of defined it as it seems like the HPI is more focused on the innovation. So, we teach the design thinking method for the sake of whatever it puts out. Whereas when Stanford came, we quickly could see Stanford's focus is more on the innovator. So, we teach design thinking to change and transform people into innovators. We're not worried about what they go and put out. We're worried about what we put in that gives them a transformational experience. So, from our standpoint of looking at our original vision of "How do we bring innovation skills to Malaysians?", we essentially had to make a choice or we felt like we were kind of making a choice. Which of these two philosophies do we really ascribe to? In the end, what we decided that for us, we will focus on the innovator. What we're trying to do is really build skills into them so they can go and be whatever they want to be. (G5, P20)

In contrast to the dominant education system, DT education provided an opportunity for the individuals to experience a new way of learning and critical thinking. Therefore, regardless of the solutions that were created, teaching young cadets a new way of thinking and working as they embarked on their roles in public sector was a significant objective of the program:

> Giving them the empowerment that, "my idea matters", although it might not lead to the best idea, but it matters. Giving a voice to everyone, that makes a huge difference I think because before that, they didn't really have the chance. (G2, P19)

The way many informants talked about DT's potential for their context showed how they viewed the significance of their program in bringing change to their country. For instance, one program manager said "what we're doing is part of designing Malaysia". Another program manager who had received a government scholarship to become an engineer, described the impact they had by teaching DT to government cadets:

> If you think about that, that is actually very, very significant and being able to play with their brains and, in a crude manner, if you get to program them in a way that builds the nation in a positive direction, which I believe in, that is for me, nation building. That is for me, it's a good way of me returning the investment of what the government made. So that's why I joined Genovasi. (G8, P110)

In response to the question about the expected learning outcomes of the program, the change in learners' mindset was mentioned in almost every interview, which is reflected on the school's website as well (see dschoolmalaysia.com, 2019).

The language used to refer to DT mindsets, calling them the *12 Commandment* is quite telling of their importance for Genovasi. The coaches and program managers would remind their participants of these "commandments" many times throughout the program. They were also visually present in different working spaces. I received a framed version as a gift at the end of my visit as well.

Figure 21: A large poster of the "12 Commandments" on a wall of one of the studios at Genovasi.

The way that the executive director of the school talked about their program and DT in general – calling it a "core competency" that everyone needs to have – further shows the school's emphasis on changing mindsets:

> Design thinking, the way we see it now after five years of practicing it, it actually liberates society. It may come out as purely to improve or to inculcate innovative thinking, but in doing that, you actually liberate society. We are saying there's more than one way or there are better ways or there are more productive ways to approach any issues or resolve any problems. If the person adheres and be a very loyal design thinking practitioner, you already liberate the mind. The West can hardly think of it in that manner because the moment you're born, you're encouraged to just think. Just think. Whereas we say, "No, only the older people can think." You listen to their advice." (G10, P10)

In the next section, some of the strategies that the educators applied to instill those mindsets will be discussed in detail.

4.2.2.3 Modeling Behavior

"It's always about behavior" (G1, P17) as one of the program managers put it. *Modelling behavior* was one of the most emphasized adaptation strategies. The educators were cognizant of the example they would set throughout the program and made sure they enacted the mindsets and behaviors they wished to instill in their audience and acted as role models through the entirety of the 10 days of the program:

> What I really notice very obviously is that whatever I do and whatever I show to them, they would take it directly. If I model meh behavior, if I give like 10%, they will give me 5%. I've noticed that. Even on my most tired days, I can't give that to them. I need to model good behavior because they will see and they like. We have to match or at least meet people halfway. That's a good attitude that I try to instill. (G2, P63)

The educators tried to note learners' positive behaviors and celebrate and reinforce them, as one coach explained: "Let's just say simple example like somebody

gives a really radical idea whereby he's known not to do that. 'Great, love that idea!' You highlight the idea." (G1, P17).

One of the program managers who was also responsible for onboarding new coaches explained that it was important for the new coaches to have what they called "the instinct to call out those positive behaviors" and pay attention to those moments throughout the program:

> It's not easy, honestly speaking, because not everybody understands the way my approach is, but I know it's beneficial for them [the new coaches]. I know that only good will come from them. I want them to be uncomfortable; I have to be uncomfortable, again, modeling that. It's a journey, I guess, … I want to make sure that a year from now, these guys are self-sustaining on their own. That's my clear objective. A year from now, that they're on their own. (G1, P17)

In a context where the educators are often seen as the ones with all the answers, stepping away from that role in a meaningful way was important for the new coaches:

> One thing I'm trying to develop in the coaches a lot is that it's not always you having the answers. You model the answers for them. You model the behavior. You start with yourself. You be an active participant. Really, your job is really facilitating them to come up with answers themselves. (G1, P17)

Instilling a positive attitude towards learning through experimentation was another important aspect, especially considering that the dominant education practices discourage experimentation:

> If they get it and if I am able to give them a very positive attitude to learning, then I think I have done a good job. It's about instilling that good attitude. Languages aside, it's about instilling the right kind of attitude to learn and to not fail, but to learn again and again. I know we emphasize on "fail early and often", but I always try to switch into, this is a new learning because it is. It's semantics. Really failing early and often is a new learning. With failing, a lot of people fear the word failing and they just shut down. They are like, "No, I'm not going to fail. No, no, no, no, no." If we twist it around, this is a new learning. This is a new

> discovery. They change their perspectives because you have changed it. You have made a negative into a positive. (G2, P57)

The educators understood that the mindsets and behaviors they were promoting were new and at times uncomfortable for their participants. To set an example, they would also make themselves vulnerable and put themselves in uncomfortable situations:

> Malaysians are very open and friendly people. If you show them, so modeling good behaviors because they are open and friendly, that works. I'm a private person I would say. I'm very reserved to a lot of personal information. I think they could see that in the beginning because I would just share very superficial things. Even when doing team check-ins, so if I wanted to model good behavior and get deeper stories from them to build a better bond, I would need to do something vulnerable as well … Because when you're open and candid, they trust you and you trust them. It works two ways. I kind of expected people to trust me by not willing to give trust. That's a strategy I would think a lot of coaches do it as well. Just putting your guard down and being equally as vulnerable with them. Because we are all human beings. If you show human emotion, chances are you will get human emotion back. (G2, P67)

The coaches used a lot of demos when introducing DT methods. Demos are often pre-practiced or improvised between two or more coaches. The coaches made themselves vulnerable and were the first to approach people on the streets for interviews to demonstrate the dos and don'ts of interviewing:

> In terms of tools and frameworks, we stick to the ones we know but in terms of explaining it, we do a lot of demo. I feel like we do a lot of demo just to show them that they can do it. So, we focus a lot on modeling behavior and we don't demo it within coaches because that will still have the element of this is just all a scheme. So, when we do demos, we try to do it with real users to show them it can be done, so a lot of it is about behavior and mindset. (G6, P69)

Finally, "Teaching teams with teams", one of the school's *12 Commandments*, was another principle that the educators tried to follow in their delivery. One of the program managers explained the benefits:

> It's a technique that helps them [the coaches] to deliver a message by not telling, but by showing. So, in some instances they have to manage two teams and one performs sometimes better and some are not and this is very normal… From one angle from coaching standpoint, what we notice is if you spend too much energy, too much verbal explanation, it's yada, yada, yada here, yada, yada, yada out. But if you say, hey, come here. Look at that. And then they immediately, oh wow. Okay. I got it. Okay, let's do that. So, it's in the context of saving time and being able to deliver what we expect out of them, it helps a lot. At the same time from the team's angle when they teach team with team, we do realize that when you do projects in say one, two, or even three cycles, you experience Design Thinking at many different spectrum levels. So, when you share this with each other, you are actually getting slightly different new light to how Design Thinking is, or Design Thinking can be used. (G8, P183)

4.2.2.4 Being Mindful of Local Needs

Cultural sensitivities played an important role in designing the program. The school tried to observe all cultural celebrations and designed their programs according to a variety of holidays and festivities:

> To make it more inclusive, what we also do is we acknowledge all the celebrations, meaning, religious celebrations and sensitivity. Meaning that our empathy goes beyond just public holidays. We notice that, oh, you know what, this is during fasting month. So, meaning that it would be challenging for participants to go out and do field work. Oh, this is during Chinese New Year and it's the week after which they usually go and do open house celebrations. So, we intentionally create these blackout periods in our calendar where we prefer not to do programs during that session. Reason being because otherwise then you ... highly likely that we'll get certain group of races, or we might cause difficulties for the rest who need the time for them to focus on their religious or cultural activities. (G8, P134)

Furthermore, they made sure to include prayer times in their daily agenda and were cognizant of their Muslim participants if they had to run trainings during the fasting month of Ramadan:

> Then there's like culturally relevant things that we have to pay attention to, like we will often end up running programs during Ramadan. So, we have to make kind of physical space for that to happen and be aware of the fact that our participants are here, but they haven't eaten all day and they can't. So, those are things that we have to kind of physically observe. We can't just pretend like they haven't eaten all day and expect the same results, right? (G5, P42)

Some informants wished for more adaptation of the pedagogical approaches to the locals' needs and providing more balance between the experiential nature of DT and guidance and theory. One of the program managers who taught in both Malaysia and the USA talked about the differences they observed in both contexts:

> I don't know if they tend to ask more questions before they try something, but my guess is that maybe they do. So, this idea of like try it first and ask informed questions later is a really crazy concept for them, I feel like. So, many of them have never tried anything like this before. So, they want to clear as much as they can before they start a process. So, modeling it for them and getting them to the do is harder. (G5, P36)

Many informants blamed the education system for the participants' struggle with dealing with the ambiguity that is part of the DT process. The following are some examples of how the informants talked about the education system: "You should know what you know, and that is all. You don't question." (G2, P17); "You memorize stuff, you don't actually think analytically or creatively." (G9, P24); "Because of our school education system, people here are not used to critical thinking skills, which is like asking why?" (G9, P37). One informant called the education system "feudalistic".

With this background, exposure to DT and its pedagogical practices in a relatively short time can be very challenging and uncomfortable for learners. The following quote from one of the coaches reflects the need for more consideration of learners' previous education experiences in the program design:

> I will say, it's not localized enough. Why I say that is because we tend to be, our community tend to be very structured … like we need more guidance. Our education system is designed in such a way that the more you memorize, the cleverer you are.

> The smarter you are. The more you can score in an exam. So, there's really not much effort needed in terms of creative thinking, we are all spoon-fed. … So, when it comes to here, to Genovasi, everything is so unstructured, it's so ambiguous. You have absolute freedom, and it scares them. And so, then they got paralyzed by so much choices, so much, suddenly they have no direction to go. When there's no direction, they don't know where to go. So, in a way that I will say, we are not very independent in terms of having our own thinking, our own opinions, and thoughts. So, it was a little bit hard for them from recently, this particularly batch, they consistently want to know that, "What's the objective? Why are we doing this?" I mean, that's totally fine but, because our idea is that we want you to practice before, to do hands on. Instead of give you too much theory. But they couldn't, for them it's very scary. So, in a way, because of that, they need more guidance, and I feel like we're still not providing that enough. So maybe what could have been done is to really empathize with them, and understanding how people here learn, and we should provide more, a little bit theory, and how can we leverage on that, to help them to understand design thinking? (G3, P28)

4.2.2.5 Adapting DT Methods

Through multiple exchanges with Stanford and Potsdam, the school had many methods for the various DT phases at their disposal. However, the educators noted that they often opted for more straightforward methods. For instance, they preferred to introduce a simpler method for the *Define* phase - often considered to be one of the more challenging phases of the DT process:

> Even in *Define*, now we use the *linear unpacking* tool, where we look at our user, their context, and then we share the tensions, contradictions, surprises, and then we jump to insights. Before that we had so many tools, we had the *2x2 grid*, we had the *geographic map* thing, we had the *venn diagram*, so there were a lot of tools and the good thing about that is that teams got to explore different perspectives of one story. But the problem is that not many people could do it because if you don't think critically, you're not going to be able to look from so many perspectives. So, the easiest way to get them to jump from a story to picking out the contradictions to coming up with insights

> was through the linear step-by-step tool. So yeah, we've actually cut down so many tools, simplified it. (G9, P41)

The educators adjusted some methods to better serve their objectives, for example introducing the concept of *improv prototyping* to push their learners to build prototypes that the users could interact with:

> So, when we first started out [our] programs, what happened is that participants would always build models. … So, at first, how we first taught them to prototype was we told them to separate the information between what are our assumptions about people, about how this idea is going to be used, how will it look like, where will it be used. So, it's very technical things about the prototype, so then we know all the aspects, but then we never really test that experience. So, we changed it into making it into an *improv prototyping*, where you get to improvise the scenario. That has helped teams stop focus on the features of it so much, and how it looks, rather to act out the scenario of when the user is going to be experiencing it. So, acting it out has really helped them to stop building models, and start building experiences. (G9, P41)

Another popular framework to help teams organize user feedback is the *feedback grid*. The *feedback grid* traditionally contains the following four categories; what worked, what didn't work, new ideas, and open questions. The educators realized that the grid was misleading their learners by priming them to focus too much on what their users liked or disliked, which resulted in potentially ignoring deeper learnings, as one program manager noted:

> I'm not a big fan of the *feedback grid*. This is my personal thing and based on my observation … If your testing is to learn, test to learn, and which is always our approach, then the *feedback grid* doesn't facilitate that. Because most of the time when they look at it, they think it's very functional in terms of the feedback. You don't treat the testing as *Empathy 2.0*. They just, "Do you like this? Do you not like this? Do you like the color? Do you like me?" There's nothing … They don't read between the lines. After a few rounds, we've noticed, okay, we had to do something about it. Because technically, testing is a really important part of it [the process], every part of it is important but this can go

> almost the opposite of every value that we're trying to teach. That led us to experiment on a new scaffold. (G1, P25)

As a result, the program managers framed Testing differently. They introduced the first cycle of testing as *Empathy 2.0*, to emphasize the importance of learning about users through testing. They also adjusted the feedback grid to include a phrase called "What it's really about" (WIRA) to encourage their learners to make the leap from feedback to iteration.

Figure 22: The teams at Genovasi using prototyping materials to make their ideas tangible.

Finally, the school experimented with a new method in the *Empathize* phase. Many informants shared their dissatisfaction with the quality and the depth of the interviews that participants were conducting in this phase. Despite the fact that Kuala Lumpur is among the friendliest cities in the world (Brady, 2019), interviewing strangers on the streets was challenging for two reasons:

First, learners felt uncomfortable asking deep questions out of politeness and fear of offending others:

> Something that's a common struggle is that once they get to an interesting topic with a user, they stop asking because they're so afraid to offend. … People are so afraid to ask sensitive or difficult questions. So afraid to offend, or so afraid to disturb. So, the thing that us coaches always say is that if they're uncomfortable, or if they don't want to talk to you anymore, they

> will tell you, so don't guess for them, don't give excuses for them. It's very hard to break that thing with them. So yeah, I think it's still somewhat related to that in the sense that the questions we get asked are sometimes like, "Why are you asking us to do things that are so uncomfortable?" They don't get that going out of your comfort zone and challenging yourself to do difficult things actually opens up possibilities for yourself, and even your own creativity. (G9, P74)

Second, getting the interviewee to open up regarding a given topic was not easy. While learners are often encouraged to ask deep questions and "dig for stories" that would evoke emotions, speaking explicitly about one's feeling is not common, as one coach explains:

> I come from a very conservative family. But I've been in the UK for five and a half years, six years. I've been exposed to both Western and Asian culture and I notice very stark differences when I first got to the UK. I noticed people were more outspoken and more expressive compared to the Asians, especially the Malaysians where we kind of expect people to have this intuitiveness of empathy of understanding people, and we are less verbal, less vocal about our needs. (G6, P20)

The educators were concerned that the data gathered through interviews in a relatively short amount of time were rather shallow and lacked the depth needed to inspire teams for the rest of the process. With this background, the educators needed to introduce alternative methods for data collection. One method they were newly experimenting with was called *empathy probe*. The method acted as a conversation opener: It often included a text, picture or both, related to the topic of the project. For instance, for a project that dealt with care-giving in later stages of life, the program manager shared a newspaper article on euthanasia, which is a rather controversial topic. This would break the ice and encourage the interviewees to share their opinions and in turn make it easier to ask follow up questions related to the project. The teams were later encouraged to create their own *empathy probes* that fit their projects. One of the program managers explained the motive behind the method and the potential challenges in using it:

> For example, using *empathy probe* and then transitioning into getting them to have a conversation and understanding the user, that is the intention of why we created *empathy probe*. You can always verbalize and highlight how we want the probe to be used, but in the actual context of using it, things can completely be different. So, we notice that sometimes when we give an object to a person, the person gets clingy to the object. So sometimes the *empathy probe* becomes an obstruction for them to say, you know, it's not about this. It's about this. (G8, P138)

The *empathy probe* method was inspired by the *cultural probes* by Gaver et al. (1999), which they developed to help overcome "geographic and cultural distance" in their EU-wide design project. *Cultural probes* are described as: "Collections of evocative tasks meant to elicit inspirational responses from people – not comprehensive information about them, but fragmentary clues about their lives and thoughts." (Gaver et al., 2004, p. 53).

4.2.2.6 Language of Instruction

In a multilingual society like Malaysia, language plays an important role in the delivery of any educational content. Although the language of instruction was English, the informants' voices presented here show how they used other local languages to connect with their audience:

> Our program in the beginning, we teach it primarily in English, which is a language that is not exclusive to any of the races. So, meaning, the Indian, Malay, Chinese, they all have their mother tongue. English is actually a second language for all. That's actually common for all. So, we make it a point to deliver the program in English, which helps to get the message across most of the time. Again, depending on the situation, if we notice that they more prefer the Malay language as what we use in the context of the government sector, we also mix it a bit so that they can understand a little bit more. (G8, P134)

One coach explained the complex role of language in Malaysia:

> The only barrier there could be [is] language, because everyone speaks English and BM [Bahasa Malaysia], but at very different levels of fluency. So, I would say that if my English is fluent, my

> BM is good. So, if I were to do empathy [user-research], for example with someone whose first language is BM and their English is quite poor, it's gonna be really, really difficult to speak to each other. Even though we grew up together, we're from the same country, language is a little bit difficult, and even within the city. So that's probably something surprising, because most countries I think everyone speaks the same language. Not so much here. (G9, P37)

Regarding DT terminologies, the educators tried to refrain from using jargons to build trust with the learners and make sure that no-one felt excluded:

> I want to develop trust with them. I don't want to create a [gap]. Because sometimes locally, they can be a bit intimidated by the way you speak. If the way you speak is very, it's almost like there's a lot of slang in it, it's just like fancy approach, it's hard for them to express themselves. (G1, P27)

Moreover, the educators tried to contextualize DT terms when needed. They used alternatives that were common in the context and provided additional explanation for clarification:

> Human-centered as a phrase is not intuitive for them [the learners] to understand, "Oh, I get that." User centric. You have to explain what a user is and what does centeredness mean. That could be a Malaysian thing as well language wise. It's not a common thing we use. A lot of these jargons are derived from American school and German school. Once they understand the context of what we mean by human-centric, they get it. (G2, P107)

Some informants were concerned about the U.S. American slangs that dominate DT instructions:

> Sometimes using a more local words or phrases that depicts the same meaning … in our POV[10] we have "We met, we discovered, we aim to help" … Instead of "we aim to help", the Stanford professors, they introduced us to this phrase called, "it will be

[10] POV (Point of View) is a method used in the *Define* phase and refers to the redefined problem statement from the perspective of the user which emphasizes their hidden need.

> game-changing to". So even sometimes when we introduce that, it can create a lot of, not to say confusion, but issues. It depends on how familiar you are when it comes to some of this casual American language. (G8, P128)

Some informants pointed out the use of hyperbolic language that is common in DT – often used to spark motivation among learners. They worried that this language might be confusing for some learners:

> I studied in the States for four years so I can somehow get it, what they [the Stanford educators] mean by "free radical". But even for some of the coaches here, they find some of these words that they use a bit confusing. But the cheerful and playful nature of these words, I personally find very exciting and interesting. But again, it has to do with understanding your audience when you're delivering it. Because if you have to explain the explanation that is actually just making it a bit more difficult for them to grasp the material, especially if it a condensed and short period of time. So necessarily, some of these nuances we intentionally changed to make it simpler and even words that they can even relate to better. (G8, P132)

Similar to the UCT case, educators tried to simplify the language to make sure that their instructions resonated with their audience:

> So, for us, it is very hard for coaches to then go in and say, "Hey, this is what empathy means," because there are slight deviations in people's take on it is. Like "analogous ideation", there's no direct substitute. I wish there was, then we can explain that concept for them. So, for me, our biggest challenge is to explain it to stick to the syllabus of Stanford word for word. So, what we had to do was translate it to turn into a layman, less sophisticated language, but more action, more experience for them to understand what we actually mean, and that's why you see our slides and our syllabus, our notes are kept to very simple language. (G6, P40)

In the beginning the school had been more specific about the language, trying to replicate the original instructions received from the d.school at Stanford. However, they adapted and simplified the language over time. A program manager recalled their experience as a participant and the emphasis on getting the language "right":

> When I was a participant, also, there was a lot of attention paid to how our POV sounded, so if it's like this word was not quite right, we would die die [*sic*] have to fix it. So, we would even have to go through the "wheel of emotion", where you pick out the right word and things like that. Whereas now, as long as the coach understands what you're trying to say, and the language and the POV is quite messed up, because they write the POV in English and some of the English is just not comfortable for them, we sort of accept it, and it's fine. You don't have to have the perfect word at POV, whereas back then, there was a lot of emphasis on having the words right. (G9, P 64)

One of the most common strategies that the educators used to overcome the potential language barriers was *code-switching*. Lin (2013) describes *code-switching* as "the alternating use of more than one linguistic code in the classroom by any of the classroom participants (e.g., teacher, students)". At Genovasi educators mixed English with the local languages to make sure their instructions were clear. *Code-switching* is so common in Malaysia that it has its own term as a coach explained: "*Rojak* is a Malay dish ... It's a mixture of fruits and savory things and sweet things. When we say Rojak Bahasa, we mean mixing English and Malay" (G2, P111). Readers may visit Abu Bakar's (2009) work for more on *code-switching* in Malaysia.

The coaches came from different ethnicities with different levels of proficiency in the various local languages. A Malaysian Chinese coach who was not proficient in Mandarin shared that: "The very first thing I do is I speak in both languages. I speak in both Bahasa and in English and to some participants who get it, I also use Mandarin." (G6, P 73). One Malay coach who was not confident with their BM as much as with English explained how they made themselves vulnerable and would use BM to build trust with learners. Another coach explained how *code-switching* would help learners feel more comfortable:

> The first thing is language. Because different people and different levels of English and BM. A lot of the time, maybe not during the inputs because they're so used to delivering inputs in English, but within the teams itself, the coaches do mix up the languages sometimes. So English and BM, because even if participants understand completely all the English words that we're using, it really makes them open up and feel more comfortable when they

> know that you can mix more languages. So, it's like, okay you're one of us, you know?" (G9, P43)

The educators tried to make sure that language difficulties would not intervene with the participants' learning. One of the program managers explained why they used simple language and *code-switching* in their instructions:

> What I'm doing there is really modeling the fact that language is not a big deal. I'm modeling the fact that as long as you need to express yourself, I'm okay with it, because as long as I understand. Which is why I model a local language, not other language, because I would understand. I want them to express themselves and to be able to realize that language is not a big deal, not so much. Not participating, not showing up is a big deal. I don't want them to not have an amazing experience just because of language. (G1, P 29)

Discussion of the role of language in education in Malaysia is beyond the scope of this work, but readers may find a more in-depth discussion in Hashim (2009) and Le Ha et al. (2013).

4.2.2.7 Appropriate Warm-ups

The very first team activity was to create a *team cheer* which often was a mix of shouting the team name and a short choreography. All four studios were very energetic for a reason:

> When we work in multi-disciplinary [teams], they have to start on mini projects and the first things first is getting let's say, team name. Agreeing on the *team cheer*. So that is always an exercise to agree on a common topic and to support that position unanimously. And when they shout it out at the top of their lungs, what they think is an energy raising game, but what really happened was a small exercise where they meet and listen together for the first time, within the first few minutes of getting into the same group, and being fully behind that position. And sometimes when it's not loud enough, we make them do it again to reinforce that subtle message. (G6, P103)

Figure 23: A team at Genovasi performing their team cheer before presenting their project at the final presentations.

Another motive for encouraging teams to shout their *team cheers* often was to help them gain confidence:

> The *team cheer* and us getting them to make a lot of noise and all that, it does help with the confidence thing, because we are, instead of individualistic, we're very community based. We do things together, so if our whole team is noisy, it makes me feel more comfortable to be noisy as well. (G9, P56)

Coaches and program managers consciously kept the energy level high throughout the 10 days of the program to help the participants overcome their shyness and reservation:

> Yeah, and again it's really about energy, like, "What's going on!?" They have no chance not to go ahead. And one thing about this is, when you put up the energy, they tend to, they will not resist the energy. Right? When you have a crowd of people cheering, or constantly encouraging you. No matter how much you don't want to do it, you will still do it. So, because you're kind of shy, so it's kind of easy to fall into prey to societal pressure, so we use that to our advantage. (G3, P94)

Creating an energetic atmosphere was such an important part of the learning experience that the school preferred larger groups so that they could leverage this energy, as one of the program managers explained:

> And once you're used to opening your mouth and shouting, the talking comes easier as well, and that's why we don't also accept classes that are fewer than twenty packs, because we need the noise, we need there to be lots of cheer and songs to bring up the energy. Without the energy, when it's quiet, I feel like the confidence goes lower as well, because then they're like, "Oh my gosh, I can't do this step." Noise sort of brings the cheer and stuff. (G9, P56)

The educators used warm-ups that were appropriate for the school's cultural context. These warm-ups often tapped into the collective spirit of the participants and were sensitive to religious requirements:

> The program has changed so much from 2013 in my class, and for the better, because in my class I remember so many moments where I was extremely uncomfortable because I am actually an introvert, and so the things that they made us do, like do a lot of speaking in front of the class, or acting, not just in the story telling but in the warm-ups. There were a lot of warm-ups where we had to be in the front of the class, and yes, a lot of presenting in your teams and speaking like that, I think that has gone down, but not because we're like, "Okay there are so many quiet people, let's accommodate to the quiet ones," but we have found different ways to allow them to shine. Rather than forcing like, "Okay we're gonna do this warm-up now and you have to stand in front of the class and do it." (G9, P62)

The informants shared some examples of the warm-ups that were introduced by the Stanford and Potsdam that either put individuals on the spotlight or required improvisation, which made many uncomfortable: "So that was so awkward, because we're just not used to standing in front and being improvisational, that's so not us. We're so used to [act] by-the-book, so we don't have that kind of warm-up anymore" (G9, P64).

Modesty was another aspect that the educators considered in choosing warm-ups, paying attention to what deemed appropriate in their context:

> But there are some warm-ups where they run just for energy levels and some of the games played are very U.S. based. For example, some warm-ups like the *puking kangaroo, name emotion.* I find it a little bit lack of design. (G6, P99)

Finally, educators accommodated for religious sensitivities in choosing and performing warm-ups throughout the program:

> So, little things like conservative Malay men and women won't want to touch each other or touch anybody of the opposite sex. So, if you're doing warm-ups for games that require a lot of interaction, you have to think about, "Can we do this? How can we do this? Can we do this differently to ensure that we're not putting anybody in a position that's going to make them not comfortable?" So, I would say that we've been really successful at that. (G5, P26)

The educators were mindful of different levels of comfort regarding direct contact and used creative ways to lead warm-ups that required touching. A female Muslim coach described how they played one of the school's popular warm-ups called the "Water story", that requires holding hands in circles:

> So, for the warm-ups, where we have to touch each other's hands, all the girls do it together, and all the men do it together and if, let's say, we're in a circle like the *Water story*, if you notice the coaches were the, we have a name for ourselves, we're like the *connectors*. So, because I'm okay touching men, I'm between the men's side of the group and the women's, so I'm like the connector. But there is that understanding, so it's not awkward at all. It's so natural for us. But high-fives are a thing, like the first time I learned I couldn't high-five my participant because he was a Muslim male, so he had to air high-five. (G9, P50)

4.2.2.8 Affirmation and Encouragement

The educators were aware of the new and at times intimidating learning experience that their participants were going through. They also understood the strong contrast between learning DT and the participants' prior educational experiences. Therefore, they constantly encouraged their learners, applauded their every effort, gave

them confidence, and sent them the message that DT is achievable for everyone. They made a conscious effort to help the learners gain confidence by feeling safe to speak up:

> Generally, we don't have a lot of confidence to speak up. Not just to offer our own thoughts, but even to ask questions because we're unclear, that rarely happens. Because asking questions to gain clarity is seen as questioning the educator. Even sharing your thoughts can be viewed as obnoxious, like, "Oh, you're a know-it-all!" So that's something that we have to deal with on terms of making sure that in our delivery we must make them feel comfortable, and often confident enough to speak freely. (G9, P37)

One of the program managers explained how they encouraged their participants to share their thoughts and helped them feel comfortable:

> Firstly, it's asking them questions and when they give answers, it's never to correct them at that moment, it's just to listen, so that they know that you're not someone who's going to beat them up for giving that answer. So, it's just really to get them comfortable just speaking. Another thing that has really helped, which a lot of our participants say is a big take-away for them, is just the use of post-its. Because it's so difficult for them to just speak freely, that for them it's more comfortable to write down their thoughts on a post-it and then to stick it on the whiteboard, and then as coach you will read these post-its and then you ask them questions from there. So, they're usually not so confident to just be the first one to speak. So that's what we do, writing. (G9, P39)

Humor was another tool that educators used to make their participants feel comfortable. They signaled to the learners that things are done differently compared to their prior educational experiences, and it's ok to behave differently:

> I think too just the disarming effect, like how do we disarm you as quickly as possible? So, if you carry a lot of doubt about your own ability to be creative or to engage or an extreme version of that, you've been sent by your company but maybe you didn't want to go in the first place. So, I think that the disarming of that through everything, from the environment to humor of the track manager to somehow communicating that it's safe and that

> everything that happens here is going to be okay gives them a lot of permission. (G5, P40)

According to a recent global survey, Malaysia is one of the top countries where teachers hold a high status (Dolton et al., 2018). Their instructional behaviors therefore hold a significant weight. By avoiding being fastidious and over-correcting the learners, the educators sent the message that DT is achievable:

> If we are doing so much effort in correcting and rectifying, modifying it, the question is, are we sending the message that this is beyond me? I cannot do this on my own. And for me, that is a bigger and more important question to focus on, which is we are not to tell the participants that Design Thinking is difficult. Design Thinking is complex. Design Thinking is unachievable on my own. I need a certain level of expertise to use it. Which in my personal opinion, is incorrect? So, I'm always against any kind of effort in over, what do you call? Not over-complex, making it more complex than necessary. (G8, P145)

The program managers and coaches understood that some of the skills applied in DT might be new to their participants or were not encouraged in their prior educational experiences. Therefore, they took their participants step-by-step towards change:

> So, when you ask participants to think critically like, "Why did they say that, what happened as a result of that, what are the consequences?" It's so difficult for them to jump to that. So, when we deliver the program, we have to bear that in mind and we have to be very careful to take them through step-by-step. (G9, P37)

Keeping the balance between pushing learners to try out something new without making them too uncomfortable was crucial:

> It's all about understanding where your audience are and then pushing them at a limit where they don't break. It's kind of like a rubber band. You pull them to a limit where they can see, oh, I can go that far, that's great. But if you go beyond that, if it snaps, then they say, I don't want to try that and they go back to ... So that is for me, that is a failure in the methodology and that realization, hey, I can go this far, is actually success. (G8, P145)

The educators shared local DT examples to show their audience that DT is achievable for them. There was a large visualization of a previous project on "Redesigning the English Language Experience", on a wall in the common area where the participants would hang out during the breaks (see Figure 24).

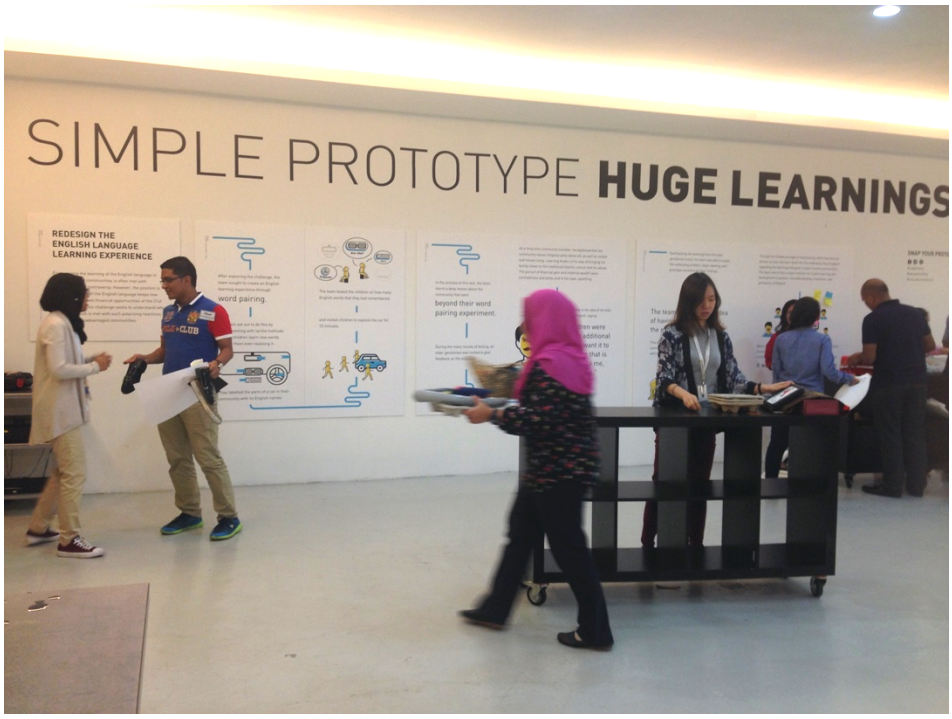

Figure 24: A visualization of a former project of Genovasi on a wall in the common area.

Sharing local examples and previous projects helped learners to get a picture of how the process could look in reality. One coach described how they would gain their teams' trust by sharing previous projects:

> Once they actually understand that, they won't really just keep asking you questions. They will actually trust you in the process and then it's like okay I know that he taught this, I know we [are] all on the right track because he says so, so just do it. (G7, P105)

4.2.2.9 Complexities of DT Space

The school was designed to serve a large number of participants. There are two floors: The ground floor houses the staff office, kitchen and a multipurpose area, while the studios are on the first floor.

The learning environment was designed to be culturally inclusive. There were an allocated room for prayer and Wudu basins in the bathrooms. In addition, there were

less visible but important aspects that contributed to the learning environment. For instance, lunch breaks were a significant part of the working day and food plays an important role in multicultural Malaysia. The staff and participants would share lunch together every day. Considering the religious diversity among participants and their dietary needs, the staff paid careful attention to food and drinks served during the program:

> So, we don't invite Indians to eat beef and we don't invite Malays to eat pork and we don't serve alcohol at functions. So, I think there is a level of kind of cultural relevance that you have to understand to make sure that when you put all those people in the same room that we can all have like a pleasant experience. (G5, P 26)

Such sensitivities among the staff were also evident outside of the program days. A Malaysian Chinese coach explained how food is one of the most important aspects in creating a culturally inclusive environment:

> I think it would be only one challenge, it would be food. Food: Halal and non-halal, mostly. We definitely have to be mindful about our Muslim friends when it comes to catering food. When it comes to buying food from our side, alright, there's a bar, I'll tend to go and take away foods that are not Halal, there's pork in it. So, we can eat around, and Genovasi is really open about it. Friends don't really mind eating next to each other. But it's our own courtesy to not use a spoon. and the cutleries in Genovasi. So, we'll make sure to have disposable cutleries from the vendors, and if we have to, you know. (G3, P26)

Music was another non-physical aspect that the educators attended to. For instance, a program manager talked about playing popular Malay songs in their studio, to make the participants feel comfortable:

> The racial part, the way we look, it doesn't matter so much, it's actually a lot [about] the language. So even in this class, I play some local Malay songs because it just sort of brings them some warmth, I think, because that's what they're used to. So, I think a lot of it is language, yeah. (G9, P46)

Although the environment was designed to facilitate collaboration and encourage creativity, the participants did not ease into the space right away. In the beginning of the program, the participants would move mostly between their team spaces and the kitchen area. As time passed, they started feeling more comfortable to move around in the bigger space, took pictures in different areas and played with the prototyping materials.

Since there was a strong contrast between Genovasi and a conventional learning environment, the participants were unsure how to behave in this new environment. One of the program managers pointed out that such space, despite being open and flexible, might be intimidating at first. Therefore, the participants might need more time and guidance to feel comfortable:

> I, having led not a lot of design thinking programs, but having led a lot of programs especially in the States, that's a very easy read, I think, for Americans. They know when they walk into a room that this is a playful place or not, where I feel like a lot of times Malaysians will walk into the room and look around and go, "Have I ever done this before? I'm not sure I know how to behave in this place." So, there still is a level of permission that has to be somehow afforded them. (P40)

4.2.2.10 Summary

The impact of the prevailing education system on the individuals' learning preferences, behavior, and expectations was brought up in almost every interview. The learners' difficulties and discomfort with DT was often due to the sharp contrast between their prior educational experiences and DT. The awareness of this contrast, along with cultural sensitivities informed many of the school's pedagogical practices, from planning to delivery.

One of the main objectives of the program was to instill the DT mindsets in learners. The focus of the school was on creating *innovators* rather than *innovation*. The program managers designed the curriculum with cultural and religious sensitivities in mind. The daily agenda allocated space for praying time. The school celebrated different cultural festivities and planned their programs accordingly.

The teaching team played a significant role in creating a DT education that resonated with their context. In a country where teachers hold very high social status,

the educators were cognizant of the weight of their position and learners' expectations. They tried to establish their roles as supporters and guides, as opposed to traditional teachers of unchallengeable authority.

The educators understood that the new learning approach was intimidating for many learners. They could relate to their learners' doubts and hesitations due to their own experiences learning DT. In addition, they were sensitive to the cultural underpinnings and social cues, which are an important part of the communication style that is common in Malaysia (Ramli, 2013; Salleh, 2005). They made sure that no-one felt uncomfortable or excluded from any of the learning activities because of their religious obligations. Finally, coaches needed to navigate the rigid hierarchies of age and status to create the flat hierarchies that are instrumental for DT teamwork.

Regarding DT methods, the educators adjusted some common DT methods (e.g. *feedback grid*) and experimented with new ones (e.g. *empathy probe* and *improv testing*) to meet their needs. Some informants were concerned about the efficacy of using open interviews in user-research and advocated for both allocating more time to interviews and applying alternative methods (e.g. *empathy probe*).

The educators chose warm-ups with cultural sensitivities in mind (e.g. modesty) and used creative ways to navigate cultural obligations (e.g. touching the opposite sex). The program managers paid close attention to their delivery and were mindful of the varying levels of English proficiency among their audience. They tried to simplify the language of instructions and find local alternatives for some of the uncommon terms. The educators used *code-switching* – also known as *Rojak language* in Malaysia – to support their instructions, but most importantly, to build trust with their participants and make them feel comfortable. Some informants pointed out the predominance of the U.S. American slangs and terms in DT. Even those program managers who had studied in the States were careful about the use of jargon and hyperbolic language which is common in DT. They were concerned that such language might confuse local learners and send them a signal that DT is not for them.

The educators used a lot of demos and shared local examples of the application of DT to show their learners that DT is achievable for them. They tried to keep a balance between encouraging learners to try out something new while not pushing them too hard out of their comfort zone.

The educators kept the energy level high throughout the training to help learners feel part of a bigger group and overcome their shyness. They refrained from activities that would put individuals on the spotlight or required improvisation. In contrast, the staff leveraged the collective spirit of their participants and chose their learning activities accordingly.

Modeling behavior was one of the most emphasized strategies. The educators viewed themselves as role models and tried to enact those DT mindsets they aimed to instill in their audience. They made themselves vulnerable (e.g. through conducting the first interview or sharing feelings and emotions) to encourage their learners to overcome their reservations as well. They used humor and playfulness to demonstrate that things are done differently here and make the participants feel comfortable to behave differently in this new space.

Finally, creating a culturally inclusive space was important, especially due to the multicultural context of the school. Non-physical aspects of the learning environment such as food and music were part of the educators' considerations, as well as dietary restrictions.

5 Discussion

The previous chapter presented the findings from in-depth interviews with DT educators about the strategies they applied to adapt their program to their context. This chapter synthesizes the findings from both cases and firstly presents the model of DT education adaptation that emerged from the data. Secondly, different components of the model will be discussed. A short comparison with an existing model will be presented before concluding with recommendations for future program design.

5.1 Model of Socio-Cultural Adaption of Design Thinking Education

The analysis of the gathered data from both cases led to the development of the *Model of Socio-Cultural Adaptation of Design Thinking Education*, demonstrated in Figure 25. The model shows that DT education can be adapted to the socio-cultural context on the following five dimensions: *Planning, Process, People, Place,* and *Presentation*.

Planning includes program objective, pedagogical approach and curriculum design. *Process* stands for an appropriate DT process model, and methods that are suitable for the context. The dimension *People* includes learners, teaching team, and other stakeholders (e.g. project partners, potential users).

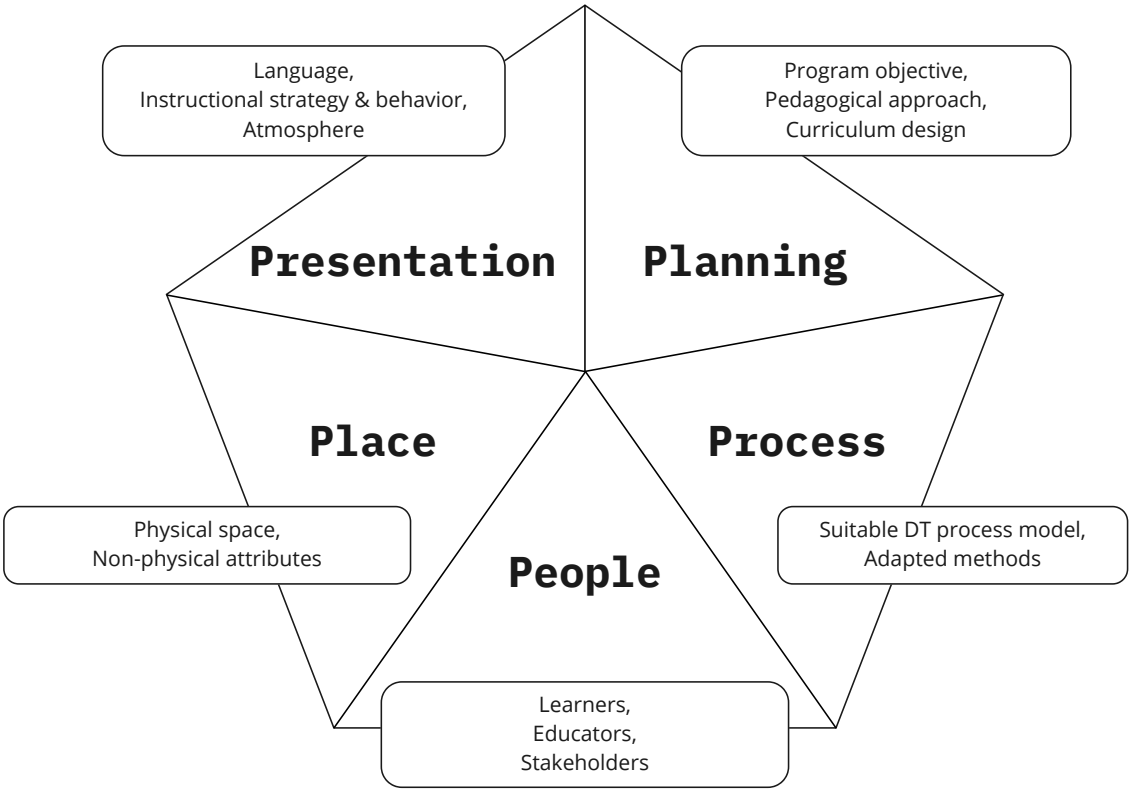

Figure 25: The Model of Socio-Cultural Adaptation of Design Thinking Education.

Place refers to the learning environment and includes both physical and non-physical attributes. Finally, *Presentation* refers to the delivery of instructions and learning activities and includes aspects such as language, instructional strategies and behaviors, and atmosphere. The next sections describe each dimension in detail.

5.1.1 Planning

The Planning dimension includes considerations regarding program objective, pedagogical approach, and curriculum design that fit the socio-cultural context.

5.1.1.1 Program Objective

In both schools, the objective of the programs and how the schools interpreted their role in their society informed different aspects of their DT education. Genovasi saw themselves on a mission to infuse innovative thinking – DT mindsets – in different parts of the society. Therefore, it is not surprising to see the emphasis on instilling DT mindsets, or developing "mindshifts" (Goldman et al., 2012), in the school's adaptation practices.

Almost every informant at the d-school at UCT talked about the potential of DT and their program for social design and addressing complex challenges that the country is facing. Social design is "the use of design to address, and ultimately solve, social problems" (Janzer & Weinstein, 2014, p. 328). However, some informants questioned the efficacy of DT – as it is conventionally taught and practiced – for tackling social challenges. Their concerns included the assumptions about designer's objectivity, the level of engagement with communities, and the underlying power-imbalance within the design process. These concerns align with the increasing number of critiques about DT – and HCD at large (Irani, Vertesi, et al., 2010; Iskander, 2018; Janzer & Weinstein, 2014; Sanders & Stappers, 2008; Staton et al., 2016).

Critics argue that there is an unaddressed power-imbalance underlying design between "privileged researcher" and marginalized and disadvantaged communities they wish to design for (Noel, 2016). Irani and colleagues (2010) believe that "all design research and practice is culturally located and power laden, even if considered fairly general." (p.1312). Kimbell (2011) points out that the dominating discourse around DT continues to "privilege the designer, however empathetic, as the main agent in design", implying a rather top-down approach (Staton et al., 2016). Iskander (2018) criticizes that: "[DT] privileges the designer above the people she serves, and in doing so limits participation in the design process." In other words, despite the claims of user-centricity, the user is consulted at certain points of the process (i.e. user-research and testing) and excluded from making important decisions.

Sanders and Stappers (2008) argue that the user is given a rather passive role as a research object to be interviewed or observed by "trained researchers". The authors advocate for using co-design where "the person who will eventually be served through the design process is given the position of 'expert of his/her experience', and plays a large role in knowledge development, idea generation and concept development." (p.12)

On creating effective social designs, Janzer and Weinstein (2014) write: "Design work applied within the social realm must be collaborative, culturally relevant, socially applicable, and empowering rather than imposing and removed."(p. 329). Thus, communities that are affected by the problem must be highly involved in the process, otherwise the projects may be ineffective or even destructive (Janzer & Weinstein, 2014)

With this background, if the program's intension is to prepare learners for social design, a strong engagement with the affected communities needs to be planned into it. In other words, moving from designing *for* to designing *with* people, as the founding director of the d-school at UCT suggested. Ideally the affected communities will be given equal power in the problem-solving process.

Another critically viewed aspect of DT for social design is the vision of designers as objective, well-intended individuals, free from bias, prejudice and blind spots (Iskander, 2018). As if they can do no harm and tackle any challenge - no matter how far from them - as long as they are equipped with DT methods and mindsets. However, as Kimbell (2011) points out the designers are influenced by their world and "like anyone else, designers can be attentive to some things, and not others". Iskander (2018) argues that like other "disciplines that rely on empathetic engagement for data collection", designers need to reflect on their "identity and political positioning". An increasing number of scholars and designers have been advocating for incorporating reflection on *positionality* in design education and practice (Anaissie et al., 2016; Aye, 2017; Iskander, 2018; Schiffer, 2020; Staton et al., 2016).

> One's positionality, the extent to which one is privileged or oppressed along different axes of identity, influences the presence and perspective that one brings to a design process. Reflexive awareness of this positionality is critical: privilege creates blind spots and opportunities to harm and/or exclude design partners with less structural power across a given dimension, undermining the empowering potential of collaboration. (Staton et al., 2016, p. 10)

George Aye, the co-founder of the Greater Good Studio and a former IDEO designer criticizes traditional design education's dismissal of the role of power and privilege: "For all the talk about being human-centered, one very human factor often gets overlooked — a basic understanding of how power operates in relationships between people" (Aye, 2017). Noel (2016) also suggests that designers should learn about the impact of power and privilege on their design practice and research during their education. Schiffer (2020) points out that although designers are increasingly working in complex challenges across the world, the design education does not prepare them for their role, writing: "Designers are left to learn by trial and error, experimenting

in vulnerable communities and designing well-intended but inappropriate outcomes" (p.419).

A DT education that aims to teach effective and meaningful social design needs to: "move away from the designer-savior industrial complex that tells us the designer can parachute into any problem and, with some design thinking, fix it" (Fuller, 2019). Instead, we need to teach designers to reflect on their positionality and relationship with the contexts they wish to serve and the skillset to facilitate co-design with different stakeholders (Irani, Vertesi, et al., 2010).

5.1.1.2 Pedagogical Approach

Learning-by-doing has become a mantra in teaching DT. However, this one-size-fits-all approach may not work in every context. In their explorative study of organizations that have adopted DT, Schmiedgen et al., (2015) report that "some experts criticize the overemphasis of the hands-on learning experience"(p.34) as the only common form of training.

Despite its relative novelty, DT education shares many commonalities with other well-established constructivist and student-centered approaches such as Experiential Learning (Beckman & Barry, 2007; Kolb, 1984) and Problem Based Learning (PBL) (Borrows, 1996). These pedagogical practices might not be the norm in many contexts. It is easy to assume that learners all over the world would accept such student-centered approaches or even prefer them to common teacher-centered classrooms. However, studies of cross-border educational partnerships show that students in countries with "spoon-fed" educational approaches often face difficulties to cope with the student-centered approach of the imported curricula (Briguglio, 2000; Castle & Kelly, 2004; Heffernan et al., 2010).

The findings align with Lee and Yuan's (2018) report on adapting their DT course at ShanghaiTech University in China that were discussed in section 2.5. If learners' prior education has been teacher-centered and test-based, adapting to an extremely different pedagogical approach in a relatively short time is challenging.

5.1.1.3 Curriculum Design

In a context where the education system is teacher-centered and collaborative team work or critical thinking are not encouraged, educators need to create a balance between experiential learning, lectures and theory and the curriculum should allow time for the students to adjust gradually. If program designers wish to teach for social design, considerable curriculum space should be given to discussions around positionality and the role of power and privilege.

The current spotlight on equity and social justice issues is a great opportunity for DT education to incorporate more critical views into the curriculum. Equipping learners with self-reflection and awareness regarding their power and responsibility through design education is all-important in a world full of systemic injustices (e.g. racism, sexism, xenophobia, etc.). If these conversations are pushed aside, we are not safe from what Nussbaum (2010) calls "design imperialism".

5.1.2 Process

The Process dimension entails adopting a DT process model that fits the program objective and teaching DT methods that are suitable for the context.

5.1.2.1 Process Model

Some educators at the d-school at UCT questioned the efficacy of the classic DT process model for social design and altered the process model to fit their needs. They began the process by what they called *internal empathy*, where they created a space for the students to share their diverse lived-experiences and learn about each other through various activities. Prior to user-research, educators also encouraged discussions about the context of a given design challenge and ways to ethically engage with the communities involved.

In tackling "wicked social challenges", Conway et al. (2017) suggest to complement DT with systems thinking, writing: "while [DT] alone provides a compelling process for idea development, it fails to recognize that without due consideration of systemic complexity and power dynamics, even the best idea can lie on the shelf unused, and thus without impact." (P.8) Carissa Carter, the Director of Teaching and Learning at the

Stanford d.school recommends educators to move away from "the process" – the famous five hexagons – writing "they are just a first recipe, a suggestion for how to get started." These popular process models are helpful in introducing novices to problem-solving through design, but educators need to stay open to change (Carter, 2016).

In "Design Thinking for Social Innovation" – one of the early articles on DT for social design – IDEO's CEO Tim Brown and Jocelyn Wyatt describe how IDEO learned to apply the same process they used in product design to other fields and eventually moved from "designing consumer products to designing consumer experiences" (Brown & Wyatt, 2010). Janzer and Weinstein (2014) criticize this approach and argue that the same process that led to innovative product designs – like the Oral-B toothbrush designed by IDEO – should not be applied to complex and multifaceted social challenges, writing: "One size does not fit all in terms of approach – what is useful for creating an object is likely not useful for creating social change."(p.331) The scholars advocate for borrowing from social science toolkit and adopting different processes.

In recent years, some designers have attempted to enhance the shortcomings of the classic DT process for social design and have offered alternative process models. "Liberatory Design" by Anaisse and colleagues (2016) – a collaboration between the d.school's K12 Lab and National Equity Project – and "Equity-Centered Community Design" (ECCD) by Creative Reaction Lab (creativereactionlab.com, n.d.) are examples of such attempts. Both approaches put inclusion and equity in the center of problem-solving and encourage designers to think about the role that power and privilege play in the process. In the following, I present the "DT for Social Justice" process model by Staton et al. (2016), shown in Figure 26.

DT for Social Justice process builds on the IDEO/Stanford process model and includes three additional phases with the goal to give power to those affected by the problem. "Reflect" is the phase where designers examine their social positionality through a critical lens: "Contextualize" refers to studying the historical context of the design challenge in order to get an understanding of different social issues and underlying dynamics: "Democratize" is where the traditional hierarchies of design are dismantled and designers and communities become equal partners and co-designers. This approach values the expertise and creativity of communities in solving their own problems.

Moreover, the designer's role shifts from "savior" (Fuller, 2019) to "facilitator" (Staton et al., 2016).

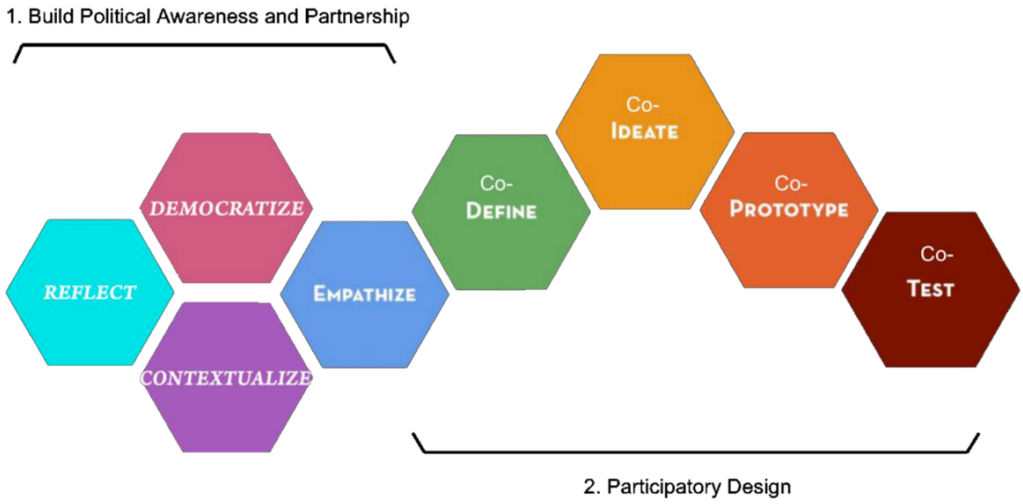

Figure 26: The process model of DT for Social Justice adopted from Staton et al. (2016)

Empathize was an important phase at the d-school at UCT. However, some informants questioned the assumption that by using the right methods, everyone can easily empathize, regardless of their background and the context. Educators recalled examples of projects where individuals had difficulties empathizing with people who had very different lived-experiences from them. The link between economic privilege and empathy has been a subject of some scholarly works such as Kraus et al., (2010) and Coughenour et al. (2020). For instance, the research on the psychological effect of social status by Kraus et al. (2010) suggest that upper-class people may suffer from empathy-deficit. Jon Kolko (2018) criticizes DT for promoting what they call "empathy-light", implying that real empathy requires more time and effort than what is often practiced in DT. The findings encourage revisiting the notion of empathy in DT and what it truly entails. It invites educators to be mindful of the gap between design teams and the context they wish to serve, thus to create project teams carefully and deliberately.

5.1.2.2 Methods

The educators in both schools adapted some popular DT methods to fit their needs and experimented with alternative methods. The educators at Genovasi were concerned about the depth and quality of user-research data gathered from interviewing and questioned the effectiveness of this method for their context. As a result, they

experimented with *empathy probe* to help break the ice in interviews and prime interviewees to share their opinions. Qualitative interviewing is a common method taught in DT introductory courses. However, it may not be an effective method everywhere. Several scholars have highlighted the need for examining the efficacy of popular design methods in different cultural contexts (e.g. Chavan & Prabhu, 2010; Gray & Boling, 2018; Lee & Lee, 2009). Chavan (2005) argues that any method is a product of the culture of its origin, thus when applied in a completely different culture, it distorts the data that it gathers. Lee and Lee (2009) point out that since many popular user-research methods have been developed in the West, their application and effectiveness in different cultures need to be questioned. Chavan et al. (2009) emphasize that the goal in user-research is to "disarm users so they'll speak candidly and genuinely. Getting people to express their feelings is challenging in most settings particularly so in cultures in which collective expression is favored over that of individuals. Specialized techniques are often needed." While interviewing can be a powerful method for user-research in Silicon Valley where DT originated, it might not be as effective where nonverbal cues hold a great weight in communication – what Hall (1976) refers to as *high-context communication style*. Some of the challenges with interviewing at Genovasi might be due to the high-context communication style that is common in Malaysia (Ramli, 2013; Salleh, 2005).

Lee and Lee (2007) adapt the "Say, do and make" framework by Sanders and Dandavate (1999), suggesting various user-research methods that suit different communication patterns (e.g. low-context and explicit communication v. high-context implicit communication style), as shown in Figure 27.

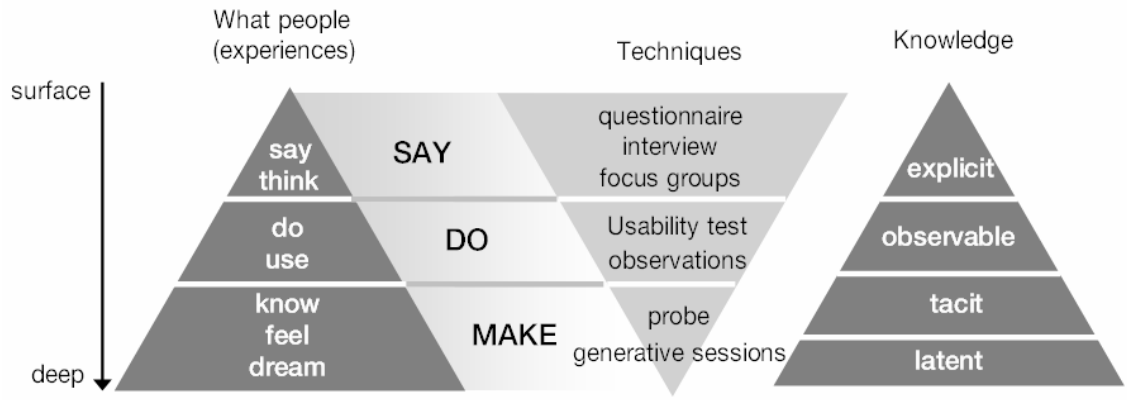

Figure 27: Corresponding methods of user-research according to different communication styles, adopted from Lee and Lee (2007)

Some educators at the d-school at UCT reported on the students' discomfort with the *persona* method due to its potential for generalizing and stereotyping. Several scholars have highlighted the danger of stereotyping in creating *personas* (Aquino & Filgueiras, 2005; Cabrero et al., 2016a, 2016b; Clemmensen, 2004; Marsden & Haag, 2016; Turner & Turner, 2011). Cabrero et al. (2016a) warn about the problematic side of *personas* in cross-cultural design: "Over-simplistic cultural assumptions and representational forms make UCD [User-Centered Design] *persona* dubious in depicting 'the other'." (p.152) Marsden and Haag (2016) also suggest that *personas* "run the risk of re-inscribing existing stereotypes and following more of an I-methodological than a user-centered approach." (p.4017) Although *persona* is not inherently a flawed method, it leaves space for designers to project their own biases in creating them (Turner & Turner, 2011). In defending the use of *personas*, Pruitt and Grudin (2003) argue that *persona* brings socio-political issues to the forefront:

> Each *Persona* has a gender, age, race, ethnic, family or cohabitation arrangement, socio-economic background, work, or home environment. This provides an effective avenue for recognizing and perhaps changing assumptions about users. If one populated a *Persona* set with middle-aged white males, it would be obvious that this is a mistake. (p.332)

However, creating diverse *personas* does not guarantee the absence of stereotypes and generalization – it matters *who* creates these *personas*. The further the designer is from the *persona* they are creating; the more room opens up for projection and stereotyping. This becomes especially problematic when designing for historically marginalized communities. Carbrero et al. (2016b) advocate for using what they call *user-centered personas* and involve users in persona creation that will help "eliciting major cultural elements for the diverse societies". Moving towards co-design would help create *personas* that are better representative of those we wish to design for.

Examining the efficacy of every DT method in different socio-cultural contexts is beyond the scope of this work. I explicitly mentioned the methods that were reflected in the data. For instance, the work of Markus (2016) on culture and motivation can have implications for the formulation of design challenges or methods for idea generation that suit different cultures. Kim et al. (2012) highlight different perceptions of the very notion of innovation among cultures, which can affect criteria for idea selection.

5.1.3 People

People refers to different parties involved in DT education, including learners, educators (e.g. coaches and program designers), and stakeholders (e.g. project partners and people affected by the project).

5.1.3.1 Learners

Unlike the dominant emphasis on multidisciplinary teams in DT discourse (e.g. Chasanidou et al., 2014; Rauth et al., 2010; Seidel & Fixson, 2013) the analysis showed the importance of having a holistic view on diversity. The overemphasis on disciplinary differences can be exclusionary and elitist. It implies that DT can only be applied by those who have university degrees. While those closest to social issues often have the least access to education, but are the most knowledgeable about the problem. Staton et al. (2016) raise concerns that "DT suffers losses in quality by using politically problematic conceptions of knowledge and expertise."(p.6).

The d-school at UCT did not shy away from differences and created a space for their students to share different aspects of their diverse social identities and lived-experiences. Stephens et al. (2019) emphasis that "difference matters"; In today's diverse and divided world, instead of avoiding conversations around social-group differences, educators need to embrace them and help their students "to better understand the contextual nature of these differences". They argue that such discussions will benefit students and "help ensure that 21st-century students will be equipped with the inter-group skills they need to navigate today's increasingly unequal, diverse, and multicultural world." (p.14)

5.1.3.2 DT Educators

The analysis showed the significant role that educators play in designing and facilitating the learning experience. It highlights the importance of educators' skills and knowledge beyond DT. Those who teach DT often occupy a space between academic faculty and practice. In this work, I use the term *educator* referring to both coaches (who work closely with teams) and those who design curricula and lead the learning experience (called program managers at the d-school at UCT, Genovasi and HPI D-

school). This is to avoid carving a special space for those teaching DT, which might run the risk of overlooking best practices from educators in different fields.

Body et al. (2010) suggest that a successful design facilitator is able to take a strategic perspective, human perspective and a design perspective. They further highlight the various personal qualities and attitudes of a facilitator such as inherent curiosity, suspending judgement, and working within constraints. Tschepe (2018) explicitly explores the attributes of an effective DT coach. Drawing from qualitative interviews with experienced DT coaches, they suggest a number of qualities (e.g. being empathetic, appreciative, and reflective) and capabilities (e.g. acting flexibly and intuitively, knowing when to intervene, and being sensitive to convergence and divergence) of a successful coach. The findings from this work shed light on additional attributes that are needed for teaching and facilitating DT in different contexts, such as the ability to read social cues, relate to the learners' experiences, social justice awareness, and cultural humility, which are discussed in the following.

The educators at Genovasi viewed themselves as role models (Tierno, 1996). Aware of the significance of teacher's status in their country (Dolton et al., 2018) they tried to enact the mindsets they wished to instill in their learners throughout the program. Considering the strong teacher-student hierarchy in traditional classrooms in Malaysia (Tee et al., 2018), DT educators used humor and playfulness to break the hierarchy and establish their roles as facilitators instead of knowledge-bearers. However, young coaches also had to navigate the hierarchies of age that is common in their context (Kennedy, 2002).

The analysis further showed the importance of DT educator's background and lived-experiences in heterogeneous contexts. At Genovasi, the coaching team was sensitive to different cultural norms among their learners. By reading social cues, they were responsive to the learners' needs - something that might be difficult for non-local coaches. At d-school at UCT, having a diverse teaching team that in addition to DT expertise was attuned to equity and social justice issues was deemed important. As Alexander (2016) argues: "Social justice is central to the promotion of multicultural education"(p.120).

Many have argued the need to integrate social justice in teacher education programs (Francis & le Roux, 2011; M. McDonald, 2005; Smith et al., 2009). DT and

design at large are extremely powerful fields with impact in industry, social innovation and policy making (Mintrom & Luetjens, 2016). The language used to describe those trained in DT (e.g. change maker, wayward thinker) is telling of the power we attribute to them. Thus, DT educators need to instill a sense of responsibility among their learners as well.

Finally, the analysis showed that DT expertise alone does not suffice for effective teaching to multicultural learners around the globe. While the demand for DT education is ever increasing, a common model is to have educators travel to different parts of the world to help set-up new programs or train local educators. Having experienced educators from other countries can bring in new perspectives and know-how. However, if they are dismissive of the nuances of the context they wish to serve, the exchange may result in unintended harm. As Fazal Rizvi (2013), Professor of Global Studies of Education put it:

> Educators, like everybody else, come to their roles against the background of an already formed subjectivity, which is linked to different histories of power and powerlessness. They are moreover socially situated actors who are caught up in power relations of gender, ethnicity, and race in ways that are not arbitrary but are historically situated, and may not be entirely understood by them. (p.177)

With this background, and considering the powerful role that DT educators play in training future change makers, they need to adopt *cultural humility* in their practice (Fisher-Borne et al., 2015; Lund & Lee, 2015; Tervalon & Murray-García, 1998). *Cultural humility* is a life-long process that requires professionals to engage in self-reflection and self-critique with the goal of understanding power dynamics (Chang et al., 2012). *Cultural humility* originated from healthcare (Fisher Borne et al., 2015) and has been gradually taken up by different fields (Greene-Moton & Minkler, 2020). It encourages professionals "to reflect on and address [their] own biases and actively seek to understand and address the cultural or social realities of the diverse individuals, groups, and communities with whom [they] interact" (Greene-Moton & Minkler, 2020, p. 144)

5.1.3.3 Stakeholders and Communities

As DT and design at large are often taught by working on real world projects (Baynes, 2010), it is important to consider the level of involvement of different stakeholders. Some informants at d-school at UCT wished for including different stakeholders – especially communities that are affected by the given challenge – through the entirety of the program and as part of the design team.

Abdulla (2014) points out the relatively short life of social design projects in education programs, posing the critical question of "what happens to the project when designers graduate?" They emphasize the need for institutions in the field of social design to commit to local communities and create a mutual engagement writing:

> Mutual engagement can remove the 'us' and 'them' factor if designers make the effort to understand various social, economic, and political issues relevant to the place, exhibit an attention to research, a knowledge of local values and customs, and most importantly to stop thinking of the community in which they are working in as passive recipients but rather as collaborators (p.256)

Considering a reciprocal approach towards different stakeholders – especially the communities we wish to design for in our programs – assures that they are not solely being used as a vehicle for the students' learning, but also benefit from the learning experience.

5.1.4 Place

Place refers to the physical and non-physical attributes of the learning environment. Research suggests that the physical environment can have a positive impact on creativity (Ceylan et al., 2008; Dul & Ceylan, 2011; Martens, 2011; Thoring et al., 2020). Some researchers have explicitly looked at the role of space for DT education and practice (e.g. Schwemmle et al., 2018; Thoring et al., 2012; von Thienen et al., 2012). There often is a certain look and feel to the physical spaces where DT is taught and practiced. Spaces that can be easily adjusted, movable furniture on wheels, prototyping materials, and white boards are some of the elements of a typical DT space (von Thienen et al., 2017). In their ethnographic study on the work of transnational designers, Irani and colleagues

(2010) show how tools like markers and sticky-notes work as "a form of infrastructure" for designers across cities and borders. These simple tools not only facilitate working with clients across cultures, but also hold symbolic values (Irani et al., 2010).

The look of many of today's DT spaces can be traced back to the d.school at Stanford, which indeed was a unique educational space at the time of its founding. The following excerpt from a chapter on the importance of space for DT education by von Thienen et al. (2012) describes Stanford's d.school:

> In general, at the d.school the furniture is highly mobile since all the heavy equipment is installed on wheels, including the big red couches in the lounge. There is a great variety of equipment for prototyping, exercising or playing; there is lots of technology available and team spaces are set up in such a way that groups may work actively in some sort of privacy while staying in touch with the world around them. (p.59)

Some of the typical d.school furniture can now be seen all over the world. The red couch mentioned above is a good example: A common IKEA couch, to which four small wheels were added by the d.school staff. The d.school website describes it as their "longest living prototype" and "a symbol of design thinking and design doing" (D.school.stanford.edu). Today, the red couch can be seen in the four schools in Stanford, Potsdam, Cape Town and Kuala Lumpur, as shown in Figure 28.

A typical DT space signals to those entering that "hey, you enter this kind of situation, behave accordingly!" (von Thienen et al., 2012, p. 67) Schwemmle et al. (2018) write that "entering a DT place tells the user to leave ritualized work-modes behind" (p.276). However, the findings from Genovasi showed that the effect of space is not always as immediate as suggested. Individuals might not know what is expected from them if this new space is extremely different from any prior educational environment. Thus, DT educators need to facilitate the interaction between learners and the space and consciously demonstrate that things can and should be done differently.

Figure 28: Red couches at DT spaces all around the world. Clockwise from top-left: d.school at Stanford, USA; Genovasi in Malaysia, d-school at HPI, Germany; d-school at UCT, South Africa (d-school at UCT, 2017b; HPI d-school, 2021; Nair, 2013; Stanford d.school, n.d.)

Furthermore, the analysis showed that the educators at Genovasi paid attention to non-physical attributes such as food, drinks and music to create a culturally inclusive space for their participants.

A program manager at the d-school at UCT raised concerns that the high furniture popular in DT spaces are not inclusive of people with different physical needs. In an article titled "How to Make DT More Disability Inclusive" in Stanford Social Innovation Review, Coleman and Trudelle (2019) describe how a team of educators, researchers, disability advocates and designers worked together to make DT accessible. This resulted in a set of adjustments to the traditional DT process, teaching materials and the physical space. They also point out that working at high tables which is often encouraged "to increase blood flow and promote energetic posture", excludes people with different physical needs. As a result, they used shorter tables.

In designing DT spaces, Schwemmle et al. (2018) suggest that "exemplary places" like d.school at Stanford or d-school at Potsdam should not be reduces solely to their physical aspects and copied without considering "context- and process-related requirements and neglecting hidden structures of innovation places."(p.279). Klooker et al. (2015) emphasize the need for defining the "strategic intent" prior to constructing innovative spaces. Schwemmle et al. (2018) suggest a number of physical and non-physical aspects that affect "place making" in organizations. They recommend "incorporating user's needs with regard to information and knowledge exchange, collaboration and integration as well as communication and teamwork." (p.280). This research showed that cultural needs (e.g. allocating a prayer room) also need to be considered.

While having a dedicated well-designed space for learning and practicing DT is ideal, too much emphasis on physical attributes might be exclusionary. It may send the signal to learners that DT is only achievable in such special places and fail to prepare them for working in the real world and under constraints.

Finally, the COVID-19 pandemic left many of the well-designed DT spaces empty and many education programs are now offered completely remote. Digital whiteboards and tables at homes have replaced the fancy furniture. This offers an opportunity to revisit the role that physical space plays in DT education and practice.

5.1.5 Presentation

Presentation refers to the delivery of the instructions and includes aspects such as language, instructional strategies/behaviors, and atmosphere.

5.1.5.1 Language

The analysis showed the crucial role that language played in teaching DT. The educators were aware of their multilingual audience and tried to keep the language clear and simple, since difficulties with language might disrupt learning (Dobos, 2011). Briguglio (2000) suggests that the challenges of students in adapting a new learning methodology are often more due to language proficiency rather than teaching and learning styles.

The educators also avoided jargon and terms that could be confusing. It is worth noting that DT terminology is heavily influenced by the context it originated from. Design jargon (e.g. point of view, pain point) and U.S. American slangs influenced by the Silicon Valley tech scene (e.g. disrupt, "fail early and often") have often traveled with DT education. "Designers are notorious for using expressive words specific to their trade" writes D'souza and Dastmalchi (2017). In recent years, some designers and practitioners have criticized the extensive use of jargon in their field (e.g. Jen, 2017)

Concerns about the counterproductive impact of jargon are not unique to the design field. In healthcare where collaboration between different disciplines is encouraged, the use of jargon is one of the main hurdles against effective collaboration (Sunguya et al., 2014). Marshall et al. (2011) recommend avoiding jargon not only fosters collaboration between the healthcare team, but also helps to include patients and their families in the process.

Although DT jargon may ease the communication between the field experts, it excludes people from other disciplines. In addition, they may confuse and alienate learners who are not native English speakers. Learning a new methodology is challenging on its own and learning new terminology on top can be overwhelming.

Finally, the educators at Genovasi used *code-switching* to not only make sure their message is conveyed correctly, but also as a way to build trust and make learners feel comfortable. *Code-switching* is known to have a positive impact on students' learning in multilingual classrooms (e.g. Ahmad & Jusoff, 2009; Cahyani et al., 2018; Kharkhurin & Wei, 2015).

5.1.5.2 Instructional Strategy and Behavior

The analysis showed how the educators at Genovasi used affirmation and encouragement to give the learners confidence and encourage them to be creative and try something new. Although literature has long suggested the importance of intrinsic motivation for an individual's creativity (Prabhu et al., 2008), as Xue et al. (2020) point out "most research examining motivation and creativity has been done in the Western cultures, and very few in the context of the Eastern cultures." (P.38) Markus (2016) argues that what motivates people depends on their cultural context writing "people in Asian context tend to underscore the motivational power of others; those in European

contexts stress the force of individual thoughts and feelings" (p.162). Kim et al. (2012) studied design students at three schools in Korea, Europe, and the USA and observed that at the Korean school, the professor's recognition was an important drive for the students to be more creative. The findings are supported by the literature on the role of teacher encouragement on students' creativity (Reeve, 2002; Runco & Johnson, 2002; Sternberg, 2007; Yuan et al., 2019).

Educators at Genovasi relied heavily on *modeling behavior*. Schweizer et al. (2016) refers to *modeling behavior* as one of the DT mindsets, and writes: "Modeling behavior allows a development of DT capabilities and confidence in others via the gradual exposure and intensification of challenges over a period of time" (p.82). Modeling is a well-established instructional strategy (Bandura, 1986; Groenendijk et al., 2013; Harbour et al., 2015; Haston, 2007). According to Haston (2007) "whenever a teacher demonstrates a concept for a student, that teacher is modeling". On the benefits of modeling, Harbour et al. (2015) suggest that "modeling supports students by preparing them to tackle both simple and complex tasks and behaviors" (p.6), and Bandura (1986) writes that "modeling engages students and encourages learning." Educators at Genovasi used modeling for conveying both behaviors (e.g. openness, playfulness) and tasks (e.g. writing on sticky-notes, conducting interviews). Modeling allows individuals to first observe instead of jumping into experimentation. Therefore, in contexts where learning through experiencing is not promoted in the education system, DT educators can rely on modeling to help mitigate their learners' doubts and reservations.

5.1.5.3 Atmosphere

The educators at Genovasi created a highly energetic atmosphere throughout the program to help individuals overcome their shyness and reservations. Furthermore, the educators refrained from activities that put individuals on the spotlight or required improvisation, to avoid making learners too uncomfortable. Instead, they promoted a lot of group activities. Although "stepping out of one's comfort-zone" has become a very popular concept, too much discomfort may have an adverse effect on learning. Antonacopoulou & Gabriel (2001) suggest that feelings of frustration or anxiety have a negative impact on learning. Therefore, educators need to make sure that there is a healthy balance between nudging learners towards change without causing them too much discomfort.

In their article on globalization of PBL, Choon-Eng Gwee (2008) points out the popularity of Karaoke in Asian countries and draws lessons on how to create a motivating and conducive learning environment: "The Karaoke philosophy is simply based on creating a joyful and fun environment for its participants: everybody to participate and enjoy; be non-judgmental of participants' skills; applaud every effort; create a sense of belonging and togetherness."

Nguyen-Phoung-Mai et al. (2009) writes that while it is a mistake to offer broad cultural generalizations, "it is fair to state that most Western cultures are associated with individualism whereas most Asian cultures are identified with collectivism" (p.117). Many of the common DT pedagogies and learning activities are influenced by the inherent individualism in the cultural context of its origin (Kim & Sherman, 2007). In addition, self-expression is promoted in the education system in the States from an early age (Tobin, 1995). However, as the findings showed, the education system in many countries does not train the students to express themselves in the classroom. Therefore, learning activities that require individuals to present without preparation might also be perceived as overly uncomfortable.

5.2 Comparison to other models

As discussed in Chapter 2, there are no frameworks that explore the intersection between DT education and the socio-cultural context. However, similar themes are referred to in the *Three Ps of DT* (see Jensen et al., 2016; Schwemmle et al., 2018; von Thienen et al., 2017) or the *PPP Framework* (V. B. Hillen, 2016). I will refer to this model commonly as the *Three Ps model*, even though these authors do not cross-reference each other. My model differs from the *Three Ps* model on several aspects that will be discussed in the following.

In developing the model of Socio-Cultural Adaptation of Design Thinking Education, I analyzed the data and consulted the literature to make sense of the emerging themes. The overarching dimensions that surfaced could be categorized into five main categories: different parties involved with/affected by DT education, program design and delivery, learning environment, and the problem-solving process and methods. When

naming my overarching dimensions, I made the conscious decision to stay with the same terminology of *People, Process,* and *Place* as it is familiar to many.

Although the *Three Ps* model seems to be mostly used in DT circles, there are parallels with the *Four Ps of Creativity* by Mel Rhodes[11] (1961). In their study on defining creativity, Rhodes (1961) identifies four strands for the definition of creativity in literature. One strand refers to human beings, called *Persons*; another strand refers to processes that are used in generating ideas, called *Process*; the third strand refers to the ecological press and its influence on the person, namely *Press*; and the final strand refers to ideas, called *Products*. It is important to note that Rhodes does not view these strands as mutually exclusive. On the contrary, Rhodes suggests that although each strand has been identified uniquely in academic literature, "but only in unity do the four strands operate functionally" (p. 307). The similarities between the *Three Ps of DT* and *Four Ps of Creativity* become clear if we consider that *Press* in Rhodes' model is similar to *Place* in the *Three Ps*, and what Rhodes calls *Product*, or creative idea, is a desired outcome of DT. In other words, when all three pillars of *People, Process* and *Place* work together, the result is creative and innovative ideas.

The model presented in this work differs from the *Three Ps* model on three aspects: Firstly, unlike Hillen's (2016) work it explicitly attends to the socio-cultural context of DT education and offers aspects to be considered for designing and delivering programs that are sensitive to the context they serve.

Secondly, it challenges what *People, Process* and *Place* entail. Regarding the *People* dimension, both Hillen (2016) and von Thienen et al. (2017) refer to the importance of multidisciplinary faculty members along with project teams. However, the emphasis is often on multidisciplinary project teams (HPI d-school, 2021; Jensen et al., 2016; Schwemmle et al., 2018). Whereas this work showed the importance of educators' role as well as considerations regarding stakeholders' involvement in DT education. Regarding *Place*, the *Three Ps* model mostly refers to the physical aspects of the learning environment: "the Place refers to a variable space that invites and allows for creative teamwork and can be easily adapted to different work-modes" (Schwemmle et al., 2018, p. 276). However, my model suggests paying attention to the non-physical aspects of the

[11] I am thankful to Dr. Julia von Thienen for pointing me towards Mel Rhodes's work on creativity and the parallels to the Three Ps.

learning environment as well as the socio-cultural needs. Regarding the Process dimension, when teaching for social design, my model suggests adjusting the classic DT process models and moving towards co-design. In addition, it highlights the importance of teaching methods and tools that are suitable for the context.

Finally, my model introduces the two additional dimensions of *Planning* and *Presentation*.

5.3 Recommendations for Educators

This section offers recommendations for educators and practitioners. Table 8 aggregates these recommendations and can serve as a framework for course designers to create a course with socio-cultural sensitivities in mind.

These recommendations are mostly based on the learnings from the local educators' practices. While the recommendations aim to assist educators and practitioners, not all of them may be relevant in every scenario. Thus, I recommend that educators draw aspects that deem relevant for their purpose.

Planning	Process	People	Place	Presentation
Program objective • Set your program intention. • To develop innovators, focus on developing DT *mindshifts,* rather than final project results. • To teach social design, include discussions on privilege & power. **Pedagogical approach** • Adapt based on learners' preferences and prior education experiences. • Include fundamental DT skills like teamwork & critical thinking if missing in prior education. • Introduce "learning-by-doing" gradually. **Curriculum design** • Adapt an existing curriculum to your needs. • Learn from the audience and adapt the curriculum to their needs. • Allocate time for additional topics based on your program intention and pedagogical approach.	**DT process model** • Use common process models as a guide and adapt them to your needs. • Consider alternative models for social design, such as *Liberatory Design* or *DT for Social Justice*. **Methods and tools** • Avoid overwhelming novices with new methods. • Increase complexity of methods over time. • Methods may not be effective everywhere. • Pay attention to the prevalent communication style, especially for user-research and testing. • Co-design persona with the users or use alternative tools (e.g. *empathy map*), especially if there is a significant gap between designer and user. • Be aware of the varying perceptions of innovation, disruption is not always the goal.	**Learners** • Embrace diversity beyond discipline. • Empower learners to share their social identities. • Value their lived-experiences as much as their learned-experiences. **Educators** • Recruit from different disciplines and lived-experiences. • Sensitivity to equity and social justice issues. • Practice cultural humility. • Communicate the role as facilitators, especially in contexts with strong teacher-student hierarchy. **Stakeholders** • Ensure a meaningful level of stakeholder engagement. • Co-design with affected communities throughout program. Involve them in decision making. • Ensure communities truly benefit from the design project and are not only used as a vehicle for students' learning.	**Physical attributes** • Be mindful of your program's goals and design the space accordingly. • Create a space that is inclusive to a variety of physical and cultural needs. • Avoid overemphasizing the physical attributes of DT spaces. • Prefer adaptability of space over fixed physical attributes. Be prepared for the unexpected (e.g. COVID pandemic). **Non-physical attributes** • Facilitate novice's first interaction with the space. • Play familiar and culturally appropriate music. • Be mindful of dietary requirements.	**Language** • Keep language clear and simple. • Avoid jargon. • Communicate the intended outcome of activities. • Build trust by code-switching (if applicable). **Instructional strategy** • Be mindful that educators are seen as role models. • Use modeling to enable learning through observation. • Use encouragement to help learners gain confidence. • Refrain from overcorrecting novices. **Atmosphere** • Be mindful of putting individuals in the spotlight (e.g. warm-ups that require improvisation). • Create an energetic atmosphere to help learners overcome their reservations. • Select warm-ups with cultural sensitivities in mind.

Table 8: Recommendations for future educators to create a more culturally inclusive DT learning experience.

6 Conclusion

This research highlights the importance of accounting for the socio-cultural context in the design and delivery of DT learning experiences. DT education is not separable from the context it serves and thus needs to account for its social and cultural nuances. The two case studies of DT schools in Cape Town and Kuala Lumpur offered valuable insights regarding the adaptations of teaching practices by local educators

Semi-structured interviews with the local educators, complemented with field observations and related documents allowed me to gain a thorough understanding of adaptation strategies. Using grounded theory, I developed a comprehensive model on the Socio-Cultural Adaptation of Design Thinking Education, which maps these strategies onto the following five dimensions:

- Planning: Program intention, pedagogical approach, and curriculum design.
- People: Different parties involved including educators, learners and other stakeholders.
- Process: Choice of the DT process model and methods taught.
- Place: Learning environment including both physical and nonphysical attributes.
- Presentation: Language, instructional strategy and behavior.

The findings further challenge some common notions of DT such as: The overemphasis on disciplinary diversity in teams, the rather shallow perception of empathy, and the effectiveness of the popular DT methods (e.g. interviewing) in some contexts. Furthermore, the findings question the efficacy of the classic DT process model when teaching DT for social design, due to the underlying power-imbalance within the process, and highlight the role and responsibility of designers. The results emphasize

the need for moving past the one-size-fits-all approach and invite educators to create diverse DT learning experiences by considering the needs of their learners in their context.

6.1 Contributions

This work contributes to knowledge by "creating new understanding of existing issues" and identifying "new and emerging issues worthy of investigation" (Trafford & Leshem, 2008: p.141). Adopting a socio-cultural lens allowed me to identify a variety of aspects previously missing from the literature on DT education. Furthermore, this work builds theory from non-Western contexts, which is often under-researched.

While previous research on DT education and culture have overlooked discussions on adaptations or have applied predefined and essentialist frameworks of cultural differences, this study explored these adaptations through the local educators' perspectives. Unlike the dominant approaches to studying culture and education, I refrained from taxonomic conceptualizations of culture and adopted a non-essentialist view.

By conducting in-depth interviews with educators on their practical day-to-day work, the research sheds light on several elements essential for teaching DT in general as well as on the design and delivery of DT courses that are attuned to their socio-cultural context. These findings were synthesized into a new comprehensive model of Socio-Cultural Adaptation of Design Thinking Education, which was then used as a framework to develop a set of recommendations for educators and practitioners.

Furthermore, the research echoes some of the critiques of DT pointed out by other authors and draws attention to areas of improvement in DT education.

Finally, this work offers a theoretical foundation for the Three P model of DT, based on empirical analysis and linking it to the Mel Rhodes model of creativity.

6.2 Implications for DT Educators

The study emphasizes the crucial role of educators and draws attention to educators' qualifications beyond DT expertise, such as cultural humility, the ability to read and respond to social cues, social justice awareness, and the ability to relate to learners' experiences.

Educators need to consider aspects such as learners' preferences and prior educational experiences in adopting appropriate pedagogical approaches and instructional strategies. While stepping out of one's comfort zone and trying out new learning activities is promoted in DT, educators should be cognizant that too much discomfort might have an adverse effect on learning.

The findings encourage educators to take a holistic view on diversity and move away from the dominant emphasis on disciplinary differences. Diversity in teams encompasses different aspects such gender, race, linguistic composition, and physical ability. In other words, educators need to value lived-experiences as much as learned-experiences to be able to harness the full potential of learners. Moreover, in our troubling times characterized by social inequalities, the role of design is all-important. Thus, an effective and ethical DT education should instill a sense of reflexivity and responsibility in learners along with the power and skillset to problem-solve.

Finally, educators should move past the replication of common teaching practices, standardized curriculums, and importing "model" programs, and instead take the liberty to develop learning experiences that are responsive to their context. In addition, non-local educators who teach in different contexts or are involved in setting up new programs need to be sensitive regarding the socio-cultural context of the learners, go beyond what they are familiar with, and reflect on their pedagogical practices.

My appeal is that educators recognize the importance of context, and take an appreciative instead of a deficit view to socio-cultural differences and to approach these differences as an opportunity for creating new formats and learning experiences.

6.3 Future Research Directions

Future research may examine the application of the proposed model in the design and delivery of new DT courses. Researchers can apply the model in different contexts.

Further research on contexts different from the two presented cases may lead to new insights, especially since both programs were to some extent developed in collaboration with the HPI, Potsdam and the d.school, Stanford. Further research might look at cases that are developed independently.

Future research might investigate the learners' perspectives to understand which aspects of DT education resonate with them and how it can best be adapted to their needs.

Finally, considering that many DT courses were taught remotely due to the COVID-19 pandemic, it would be interesting to explore how the presented model translates to online or hybrid formats.

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8 Appendix

The appendix contains the following documents:

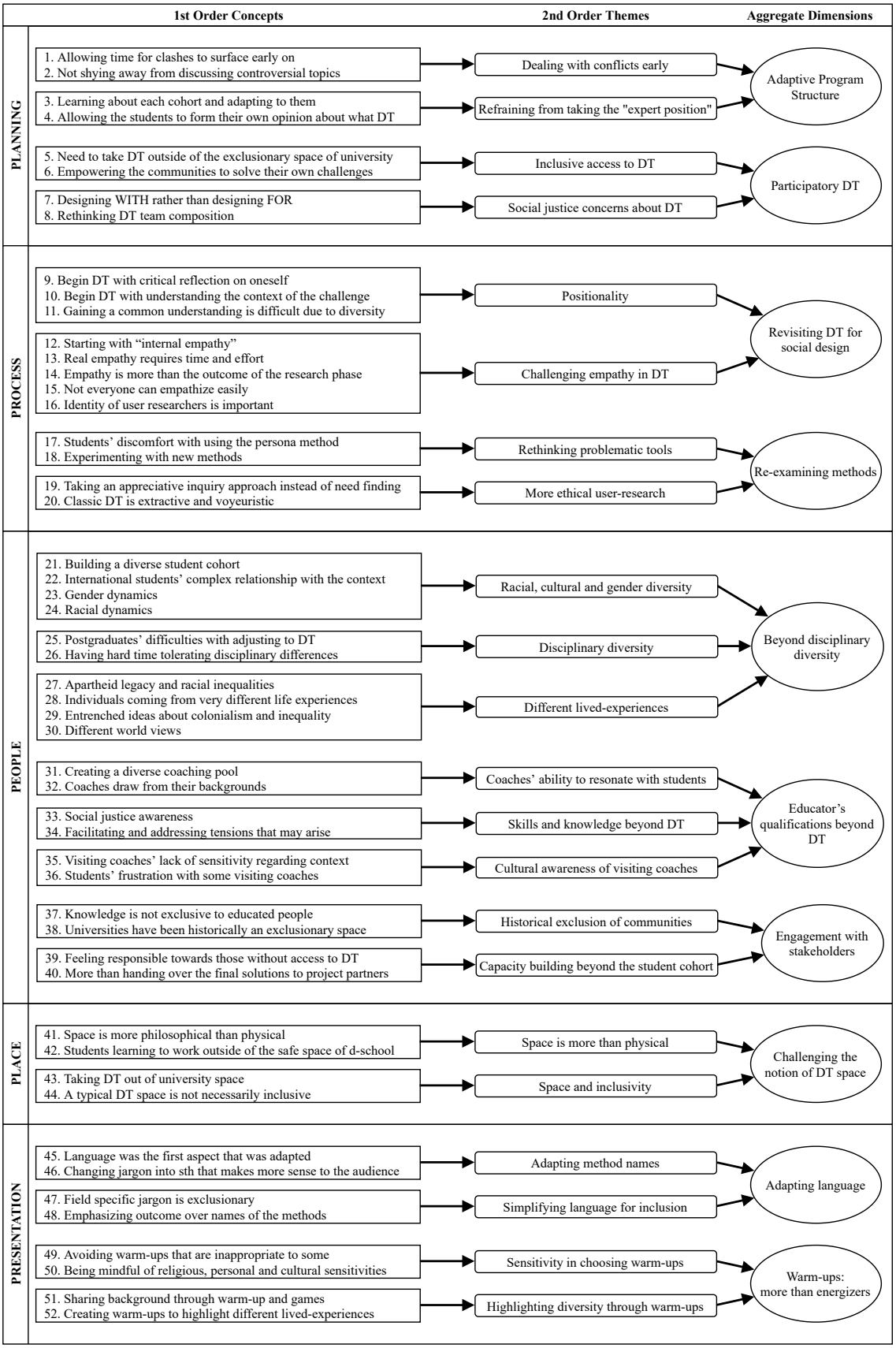
- Interview guide
- Data structure for d.school at UCT
- Data structure for Genovasi
- Acknowledgements
- Eidesstattliche Erklärung

8.1 Interview Guide

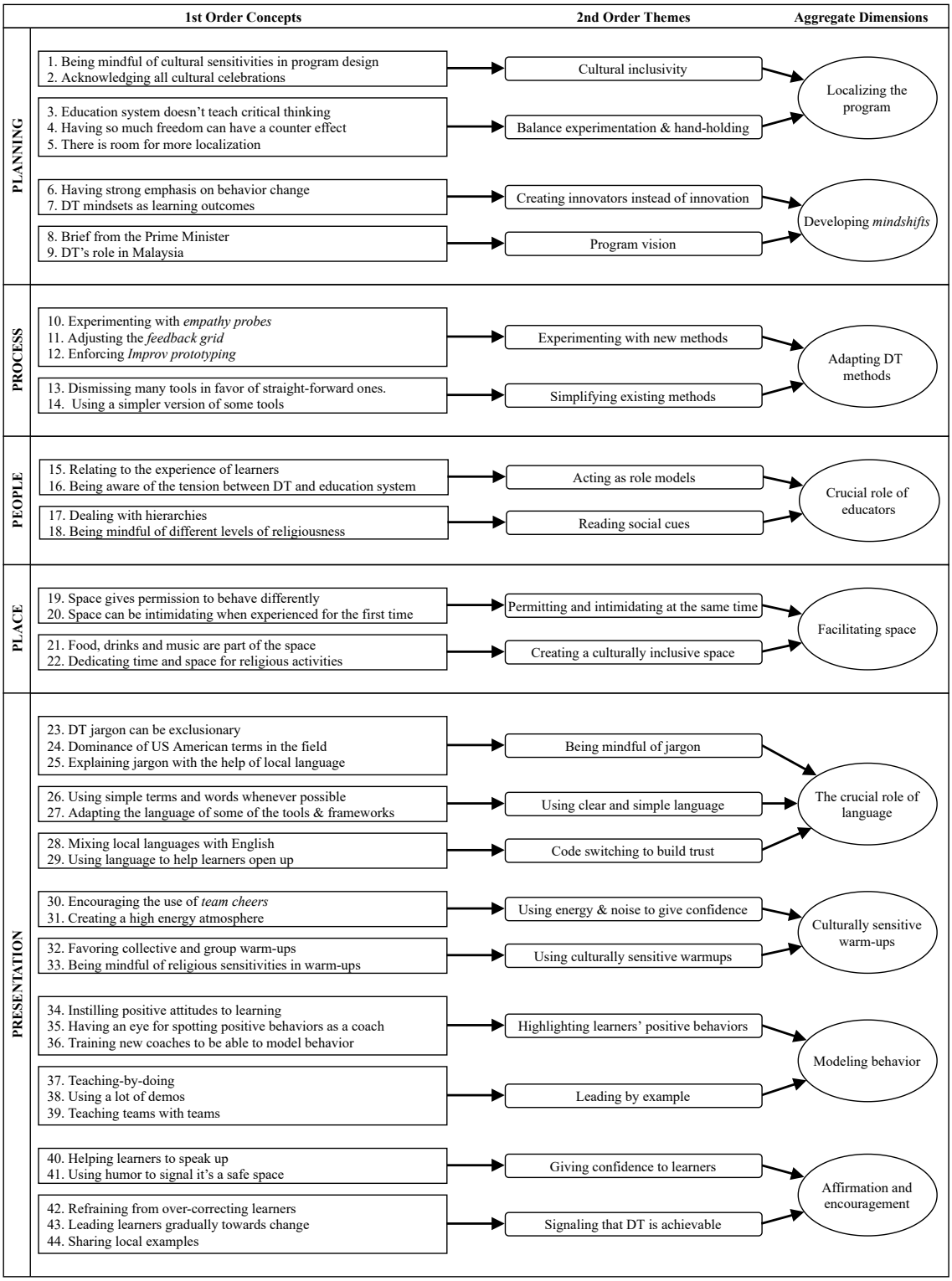
The following guide was used for semi-structured interviews conducted with program managers at Genovasi. The guides for the school founders and coaches were slightly different. Please note that these questions were only used as a guide and I adjusted the questions whenever needed.

Introduction
• Could you please introduce yourself and tell me about your role at Genovasi? How long have you been working at Genovasi? • Can you tell me about your background please? (cultural and education) • What are the main learning outcomes of this program from your perspective? • What is design thinking for you? • Have you been exposed to DT training and education in other locations? If so, can you tell me a bit about that? In what way your program differs? • What are some of the conscious decisions you made to adapt your program to your context?
Adapting the program to the local needs
• Malaysia is a culturally diverse country. What are some of the strategies and practices that you apply to create a culturally inclusive environment in your course? • Since teaching DT has its roots in the Silicon Valley context, I'm curious to hear what were some of the strategies and practices that Genovasi used to adapt the methodology to the context here? • Can you think of a method or an approach that you had to iterate or modify to make it appropriate for the context? • Based on your experience, can you tell me what are the most challenging aspects of the methodology for those learning DT here? • How do you see the role of DT in today's context of Malaysia? • In order to create a meaningful DT training for your context, what are the aspects that need to be considered? • Can you think about a time when a participant had a problem adapting to this new way of learning and working? • What are some of the challenges and possibilities of having culturally diverse teams?
DT mindsets
Consider design thinking mindsets (I hand in a paper with a collection of DT mindsets from d.school), from your experience and observations: • Which ones were the most challenging and new for participants? Why? • Which were more comfortable and easier to adopt? Why?

8.2 Data Structure for d-school at UCT



8.3 Data Structure for Genovasi



8.4 Acknowledgements

This work could not be possible without the support of many people.

First, I want to thank all the participants in my research who were so generous to grant their time in the midst of their busy programs, share their knowledge and experience with me. Thanks to Richard Perez of d-school at UCT and Dato Lee of Genovasi for their hospitality and for welcoming me to their schools. Thanks to all the coaches and program managers at both schools. I learned a lot from you.

My deepest gratitude to my supervisors, Christoph Meinel and Katharina Hölzle for all the guidance throughout this journey. Thanks for believing in me and supporting me. Katharina, thanks for your mentorship, meetings with you would always boost my confidence and motivation, especially at times of doubt.

This work was possible only because of the generous support of the Hasso Plattner Foundation. I have had the privilege to be part of the HPI-Stanford Design Thinking research community, alongside many great researchers at HPI and Stanford. Thanks to all of you for the fruitful exchanges and support throughout the years.

I have been so lucky to have worked alongside two incredible friends, Karen and Lena. Thanks for always being there for me, for giving me your time, reading my work and providing me with constructive feedback, even on short notice. Lena, your critical questions helped me improve my work. Karen, I'm always grateful for your generosity and support. Thanks for listening to my rants and doubts during our runs. I couldn't have asked for better colleagues.

Maria José, thanks for checking up on me and rooting for me. For all the happy distractions, especially in this tough last year.

To Sadaf and Sohrab, thanks for helping me stay sane and grounded. Thanks for always reminding me of the bigger picture and making sure that I go easy on myself.

Thanks to Nazanin, Mo, Taraneh, and all of my friends all over the world for believing in me.

Thanks to my parents, Akram and Hassan. I am where I am only because of you. You have always believed in me and supported me. I am happy to be able to share this with you.

Chris, I could have never ever done this without you. You supported me in every little step of this journey, from the first idea to the last character of this document. I am forever thankful to you, words cannot describe my gratitude. I am so lucky to have you in my life.

8.5 Eidesstattliche Erklärung

Die eingereichte Dissertation mit dem Titel

The Impact of the Socio-Cultural Context on Design Thinking Education

habe ich selbstständig und ohne unzulässige fremde Hilfe verfasst. Hierbei wurden weder Textstellen noch Grafiken von Dritten oder aus eigenen Arbeiten ohne Kennzeichnung übernommen.

Es sind ausschließlich die angegebenen Quellen und Hilfsmittel verwendet worden. Sämtliche wörtliche und nicht wörtliche Zitate aus anderen Werken sind gemäß den wissenschaftlichen Zitierregeln kenntlich gemacht. Die eingereichte Arbeit oder wesentliche Teile wurden in keinem anderen Verfahren zur Erlangung eines akademischen Grades vorgelegt.

Ich erkläre an Eides statt, dass meine Angaben nach bestem Wissen und Gewissen der Wahrheit entsprechen.

Berlin, 17. Mai 2021

Mana Taheri