The pedagogy of discomfort: Transformational experiential learning

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Abstract
Education is intended to be a transformative experience for the student. In the practice of transformative pedagogy, instructors provide students with the time and space to explore their own sets of beliefs, values and standards and how they incorporate those beliefs into their work, subconsciously and consciously. At times, transformative pedagogy can be uncomfortable. However, the value of discomfort in the pedagogical process of a design course is the ability to acknowledge a knowledge gap between one's social experiences and the experiences of other social identities. This paper focuses on the value of transformative pedagogy in working through discomfort when learning about limit situations, developing a foundation for transformative pedagogy in a course setting, the importance of critical thinking in transformative pedagogy and how transformative pedagogy is presented with a focus on ethics, disability and responsible design. By embedding ethics, critical consciousness and strategic thinking, the process translates into a transformative practice of design and innovation. Students learn new emerging ways of affecting change with a multiplicity of ideas when educators engage in transformative pedagogy. It is also to ascertain what kind of learning enables people to create solutions for communities involved in a continuously ongoing process of defining sustainable development.

Keywords: Design pedagogy, Empathy, Experience design, Transformational pedagogy, Transformational practice, Social impact

Introduction

It is human nature to resist and avoid pain, while we reluctantly accept that growth comes from discomfort (e.g. social, economical and political). Empathic understanding can develop through this growth and can lead to more impactful problem-solving, more relevant design outcomes, more intuitive forms of communication and the co-creation of knowledge that has transformative power. To develop thought leaders for our tomorrow, we need to reimagine how we teach them today. Education is intended to be transformative for students and provide them with the space to develop critical thinking and produce innovative work and research. Transformative pedagogy is a term that describes an educational experience or set of experiences that allow the student to gain a deeper understanding of social experiences and be transformed in their thinking to further understand the complexities of their social experiences. In the practice of transformative pedagogy, instructors provide students with the time and space to explore their own sets of beliefs, values and standards and how they incorporate those beliefs into their work, subconsciously and consciously.

When design educators create an intentional space, either physical or conceptual, for students to discuss social experiences, students are more equipped to objectively begin to analyse and create an understanding of their own lived social experiences. This ability allows them to identify a knowledge gap between their own lived social experiences and other individuals' experiences. While this process might be uncomfortable, it teaches them the epistemic practice of identifying their lived experiences and learning about another person's lived experience. In addition, it supplies them with the necessary tools, insights and awareness to create a transformative practice of developing innovative designs (Fricker, 2010).

The challenge is not only to identify transformative learning that assists people to respond and adapt to modern conundrums. It is also to ascertain what kind of learning enables people to create solutions for communities involved in a continuously ongoing process of defining sustainable development. The relevant question is not only what makes up transformative learning but also what stimulates individuals and communities to take part actively in collective growth processes leading to an as yet barely discernible sustainable future (Thoresen, 2017).

This paper focuses on the value of transformative pedagogy in working through discomfort when learning about limit situations (Freire, 1972), developing a foundation for transformative pedagogy in a course setting, the importance of critical thinking in transformative pedagogy and how transformative pedagogy is presented when the focus is on ethics, disability and responsible design. By embedding ethics, critical consciousness and strategic thinking, the process translates into a transformative practice of design and innovation. Students learn new ways of affecting change with a multiplicity of ideas when educators engage in transformative pedagogy.

Developing the roots for transformative pedagogy in design
The value of developing roots for transformative pedagogy in design is the development of space for students to focus on a specific social experience, also described as a limit situation. A limit situation is a social experience that prevents someone from living freely (Freire, 1972). An individual who gains a critical consciousness of their own lived experiences can understand how their social identities intersect with their culture and how those identities can determine their lived experiences (Freire, 1972; Pinto, 1960). Transformative pedagogy is intended to prevent the over-generalization of social experience through discussion and requires participants to develop a genuine and critical understanding of a social experience. One way of developing such an understanding is through the acknowledgement of social identities that are social constructs in our culture, i.e. race, gender and ability (Crenshaw, 1989) and the way these social constructs turn into prejudices and biases that become ingrained in our everyday lives (Ben-Ari & Strier, 2010; Nadan & Stark, 2017).

Designers can apply the iterative design research process to develop a design for a specific social experience and provide a transformative pedagogical experience. The steps include the following: 1) the development of the context of the social experience or limit experience being focused on, 2) the application of research—qualitative or quantitative, 3) the development of ideas based on learned factors, 4) the prototyping of those ideas and 5) the testing of those ideas. When implementing this process in a course where transformative pedagogy centres a social experience as the primary determinant of learning, students are prompted to engage in activities in which they must think through the perpetuation of limitations or oppression prevalent in design. Gale and Molla (2016) emphasize "[…] the importance of invoking pedagogic actions directed at creating an environment for learners to share cherished beliefs and assumptions without fear of ridicule or condemnation" (p. 253).

When engaging in pedagogical activities, students can critically assess their values, beliefs and assumptions in a way that does not simply lead them to the 'correct' answer. Instead, this form of learning highlights the diversity of design deliverables and innovation resulting from learning about social experiences different from our own and interacting with material that provides a safe learning environment. In addition, deeper understanding and empathy of others tends to reveal that many questions do not necessarily have 'right' or 'wrong' answers. Theorists focused on transformative pedagogy see immense value in developing activities that provide students with the opportunity to understand another individual's lived experience.

The experiences should not exist in isolation, but the process should involve prompts or interventions that generate critical thought in the student that requires an assessment of who they are, their values and their beliefs (Nolan & Molla, 2018).

Through the focus of transformative pedagogy, we provide emerging designers (design students) with the time and space to be innovative when designing for complex social issues. Learning about the person we are designing for is not a unique or new concept in design but is a foundation for many designers. As Koppen and Meinel (2012) wrote, "Understanding the perspective and social context of the user is one of the most important parts of design and design education" (p. 35). Transformative pedagogy can encourage a designer to consider human experiences we might not otherwise think of or even have the words to discuss. Our collective forms of understanding are rendered structurally prejudicial in respect of content and/or style: the social experiences of members of hermeneutically marginalized groups are left inadequately conceptualized and so ill-understood, perhaps even by the subjects themselves; and/or attempts at communication made by such groups, where they do have an adequate grip on the content of what they aim to convey, are not heard as rational owing to their expressive style being inadequately understood (Fricker, 2010, p. 6). By removing the 'distance' between ourselves and the experiences of others, we begin to understand knowledge from a more intimate and personal perspective. For the student, this educational experience tends to be memorable in comparison to more abstract constructs. For design students, the notion of designing for your future self (e.g. ageing and disability) or your wider community (e.g. gender and ethnicity) is critical to meaningful and impactful design solutions.

When we try to understand and contextualize a social experience outside of our own experience, we require tools that provide us with the means to be critically conscious of what is outside our known ways of understanding. McDonagh-Philp and Denton (2000, p. 111) used the term "empathic horizon" to describe "the boundaries to a designer's knowledge and understanding" (McDonagh & Thomas, 2010, p. 180). They added that understanding is itself progress toward the development of relevant outcomes. This way of understanding could occur through words that offer a person agency by supplying a term that matches a social experience or tools that physically and mentally contextualize a limit situation. While these terms or tools might lead to some discomfort for students, educators must create meaningful space for ethics and criticality to be discussed within a course—space allowing exploration or a period of discovery. Transformative pedagogy takes a critical approach to pedagogy from the perspective of both the educator and the student, and it requires both to leave their comfort zone and engage in "critical investigation of the self" (Zembylas & McGlynn, 2012, p. 1). The feelings of discomfort in these situations are important to acknowledge and are what ultimately allow a student to identify their knowledge gap and then encourage them to determine their individualized positions of accountability regarding different forms of '-isms', i.e. racism, ableism and sexism (Nadan & Stark, 2017).

Discomfort in the pedagogical process
At times, transformative pedagogy can be uncomfortable; however, when one or more social experiences are the primary learning objective in a classroom, educators can centre the activities to prompt critical reflection and self-actualization. This provides students with the opportunity to learn how their social identities differ from those around them. This type of pedagogical experience in a design course allows students to approach a design challenge from a more empathic and contextualized space of understanding.

> "*This critical analysis provides a space to create a context of understanding, a different way of knowing, to become change agents. This is evident in classes where students are presented with transformative pedagogy and transformative practices that prompt*

critical thought and interventions for disrupting the status quo […] to transform
students' experiences of discomfort into generative learning tools, a process which
requires time, energy and emotional investment." (do Mar Pereira, 2012, p. 133)

Yale professor and social activist, bell hooks, shared a student's experience walking into her classroom: "We take your class. We learn to look at the world from a critical standpoint, one that considers race, sex, and class. And we can't enjoy life anymore" (hooks, 1998, p. 42). After she heard this, her students continued to talk with her about the pain or discomfort a person can have when learning their way of knowing. Other instructors have written of a similar experience of an "uncomfortable classroom" (do Mar Pereira, 2012), which describes didactic discomfort, i.e. intellectual and/or emotional discomfort felt by students, which is triggered directly or indirectly by the material covered and/or methods deployed in a course and is perceived by teachers (and often also by the students themselves) as an experience that can enable or generate learning.

This discomfort is an acknowledgement by an individual who is starting to develop a critical lens for the social experiences of people who have different social identities. It is the act of knowing that there is a limit to one's knowledge when it comes to other people's social experiences. The acknowledgement of not knowing is a form of epistemic injustice and can be unforgettable for people who have come to this realization. As educators, we need to help students question how they tell their own stories, how they engage with a community with those around them and whether they are willing to acknowledge what they do not know. Nadan and Stark (2017) added, "The development of critical reflectivity among students is also related to their exploration of their own identities and (largely privileged) social positions and how these shape their assumptions, attitudes and images about the 'other'" (p. 686).

The impact of criticality on transformative pedagogy

A person's ability to critically understand their own social identities allows them to reflect on their own social experiences more critically. Transformative pedagogy teaches students critical thinking and critical consciousness and provides them with a lens for seeing the diversity of opportunities and ways of doing rather than focusing on a social monoculture. Nadan and Stark (2017) emphasize the importance of this process by highlighting Schön's (1983) conceptualization of a 'reflective practitioner' as one who creates new meanings through observing and analysing case experiences, either during the experience (reflection in action) or in retrospect (reflection on action)" (Schön, as cited in Nadan and Stark, 2017, p. 686). Through the conceptualization of an experience, emerging designers can develop a process in which they begin to develop an understanding of a specific social experience through listening, critical thinking, analysing and intentionally breaking down barriers in their assumptions.

> *"Having the ability to reflect critically on one's practice brings to light contradictions and*
> *inconsistencies relating to beliefs, understandings, and practices, and enables teachers to be*
> *adaptive professionals."* (Nolan & Molla, 2018, p. 722)

Transformative pedagogy allows students to develop a critical consciousness and an individualized design practice with a foundation of ethics that become embedded into their work. This style of teaching and learning ultimately translates into a transformative practice in which innovation can flourish. Siegel and Dray (2019) wrote, "When companies allow a deep emotional understanding of people's needs to inspire them—and transform their work, their teams, and even their organization at large—they unlock the creative capacity for innovation." In the following sections, we present two courses focused on how students learn new ways of affecting change about ethics and a responsible process for developing design

solutions and how their designs can affect change for people who have experiences outside of their own. The first course highlights ethics and responsible design, utilizing the framework of Racism Untaught (Racism Untaught, n.d.). The second course highlights disability and the role design can play in enhancing quality of life through more relevant products, environments and experiences, by employing empathic design research methodology.

Ethics and responsibility + design

The Racism Untaught course is a 16-week course focused on critically analysing artefacts, systems and experiences that perpetuate racism and the oppression of historically underinvested communities (Racism Untaught, n.d.). Since the development of the framework in 2018, this course has been taught four times at the University of Illinois. The students are guided through the design research process and prompted with design-led interventions that provide them with a way to analyse and reimagine racialized design challenges and critically assess anti-racist design approaches (Mercer & Moses, 2019). Students learn how "ever-escalating pressures toward simplification and speed have generated innovation in the types of deliverables that researchers produce in their effort to condense information and make it digestible to others" (Siegel & Dray, 2019, p. 82). This course aims to guide students through identifying forms of racialized design, a design that perpetuates elements of racism. The learning outcomes in this course include critically analysing artefacts, systems and experiences that perpetuate racism and the oppression of historically underinvested communities, prompting students to select qualitative and/or quantitative methods to assess individual and shared experiences of racism. The instructor works with the students to examine systemic forms of institutional racism that are essentially invisible and how we and our culture perpetuate them. This course uses the iterative design research process to cultivate learning environments for students to further explore issues of race and racism. Students utilize design research methods and processes to solve systemic problems and inspire further work in the public sector or a passion for public service.

Before the students start using the Racism Untaught toolkit, they go through an onboarding process in the first two weeks in which they unpack the concept of racism and the role racism plays in their lives. They begin the process by navigating their own story, background, cultural identity and upbringing to help shed light on their cultural biases and how they came to acquire them. The students then participate in the following activities: writing a poem critically assessing where cultural bias is present in their upbringing; creating a social identity profile in which they share five social groups they belong to and the roles they hold in each group; carrying out personality assessments; and developing a community agreement for the semester to use during more difficult conversations.

At the beginning of the course, it is verbally acknowledged that everyone is learning new concepts and language, and students are asked to be open to change and flexible when new knowledge is gained. Marta Elena Esquilin from Bryant University and Mike Funk from New York University wrote on the importance of community building and the value of engagement agreements. They provided over 20 guidelines for a meeting or classroom environment (Esquilin & Funk, 2019) to create an intentional space for conversations focused on diversity, equity and inclusion. Through a course, they work together on the development of a community agreement that includes prompts such as the following: 1) listen actively, 2) speak from your own lived experience using "I" statements, 3) seek to repair harm when you mess up and 4) step in, step back; that is, if one person is often speaking within a space, they should step back to allow others who are quieter to speak up.

Students are divided into groups based on what the instructor has learned from the onboarding activities in weeks two and three. The students are prompted with a racialized design and begin using the Racism Untaught framework, starting with the first step, context. This step has over 60 cards, which include definitions and terms that focus on elements of racism, sexism and ableism. Students use the terms in this deck to create the context for the racialized design they have been prompted with (Figure 1). The conversations often teach students unfamiliar words and prompt discussion on how forms of oppression are perpetuated and supported in the world around us. The terms also provide a specific understanding of the prompt, which prevents oversimplification and overgeneralization in conversations on race and racism. Participants often speak of the ownership of agency they earn when learning a new element of racism that applies to a racialized design they have interacted with themselves or have witnessed the interaction (Siegel & Dray, 2019). The students are asked to identify why each element of oppression (racism, sexism or ableism) are relevant to the identifier and which elements are not. This first step allows participants to understand how to break down one instance of racism into the various ways it is present. To exemplify different elements of racism in design, the course focuses on three identifiers: artefacts, systems and experiences. These three areas include comprehensive examples of racialized design, which designers can positively affect in our society.

Figure 1: The first phase in step one of the Racism Untaught framework.

CULTURAL

Systems of norms, values, beliefs, and trusted
systems of acquiring truth that preserve, protect,
and/or maintain oppression (i.e. White Supremacy).

Black culture is seen as a consumable good rather than a people's history. Beauty standards still place white features as the "norm" while black hairstyles are seen as a consumable fashion trend

Elements of Black and other ethnic cultures continue to be regarded as "just hair"/ trends for society to take part in without understanding the cultural/ historical significance to the people they originate from

Preserving a hypocritical system that abuses and undermines Black culture and voices, but also the same system that touts "all lives matter"

INSTITUTIONAL

Structural oppression that results
from agentic oppressive behavior.

White models were praised for using these hairstyles while black people still experience prejudice for them

White people continue to be able to steal from different cultures with no repercussions while members of the culture being appropriated are still unable to celebrate/ honor their heritage

People continue to dismiss/ ignore the history and present day issue of racism and perpetuate white supremacy. Despite his comments, Marc Jacobs continues to succeed as a designer, indicating how rooted white supremacy is in the fashion industry and how comments like Jacob's continue to preserve it

Culture, especially Black and other ethnic group's cultures continuing to be viewed as a commercial product

AGENTIC ACTION

When oppressive beliefs translate
into oppressive behavior.

He dismissed the people calling him out because he benefits from pretending there isn't an issue

He justifies his actions by accusing others of appropriation (women of color straightening their hair) and tells people not to be so sensitive

He take from any cultures for his own profit + participates in racial gaslighting

Maintains a system which continues to engage in these actions, thinking that it's okay to do this so long as an apology is given

He views his decision as not a big deal and vehemently dismisses people calling him out

BELIEFS

Personal beliefs, ideas, and
feelings that perpetuate
oppression.

He believes that culture is for consumption and has no greater historical importance

Jacobs doesn't see color or race and believes he has the agency to say so.

Jacobs doesn't see the significance behind his actions

Cultural elements (such as hairstyles) don't belong to any one culture/group so people shouldn't be so upset about "appropriation" -Mark Jacobs

Figure 2: The second phase in step one of the Racism Untaught framework.

The first step also includes a diagram outlining what are called the levels of oppression. This allows further contextualization of the instance of oppression on four distinct levels: 1) beliefs—personal beliefs, ideas and feelings that perpetuate oppression, 2) agentic action—when oppressive beliefs translate into oppressive behaviour, 3) institutional—structural oppression that results from agentic oppressive behaviour and 4) cultural—norms, values, beliefs and trusted systems of acquiring truth that preserve, protect and maintain oppression (Figure 2).

> *"A vague, general sense of knowing the user is not empathy. As Gregory Bateson said, information is a difference that makes a difference. Because designers are trying to*

make a difference in users' experiences, we need to be able to explain nuances of difference across those experiences." (Siegel & Dray, 2019, p. 83)

The next five weeks are focused on the second step, define. This step has about 50 cards, including qualitative and quantitative methods and theories to define how the participant might approach the design challenge. In this step, students must create a thesis question to help focus on their design challenge. The instructor provides students with this guiding question: "How might design be used to [action] in order to [create change] with [stakeholders]?" Students garner factors from their research to move forward to the next step, ideation.

The next step is called ideate and is completed in one week. This step includes over 100 cards. During this step, students begin to determine what they will create—an artefact(s), a system(s) and an experience(s)—and which will help dismantle the form of racialized design. Students determine how they can affect change and how they can be part of the solution. This step includes a quadrant map to help evaluate the value of each idea. On the x-axis, students consider the intent of the idea in comparison to the impact, and on the y-axis, students consider how far the idea might shift stakeholders from systemically oppressive thought(s) to anti-oppressive action(s). Students plot their most robust ideas and discuss whether their idea only has good intentions or if it will have an impact and focus on anti-oppressive actions against oppressive thought. This quadrant map is often revisited in the prototype stage to help students ensure they continue to work toward impact and an anti-oppressive final deliverable.

The fourth step, prototype, is worked on for five weeks. This step has approximately 30 cards and walks students through a low-, mid- and high-fidelity prototyping process. The low-fidelity prototype is non-functioning and is initially presented to communicate an idea. A mid-fidelity prototype is limited in functionality, and a high-fidelity prototype requires minimal modifications for the final deliverable. In this step, students work iteratively through the framework to further contextualize or apply research methods to help them understand how the idea they are creating impacts communities. The last step is called impact and is focused on for one week. This step has approximately 20 cards. This step helps students understand their impact on their work because of the iterative framework and design interventions. This process is iterative and the time frames are meant to support the students moving to different steps to ensure they are conducting research and learning from the people who would engage with their designs.

Disability + design

"If a designer chooses a scientific approach, the whole design process will have strong similarities to a research process. This will limit or eliminate not only what is considered to be the preconditions of the design, but also what is possible, what is needed, what is desired, and what the eventual outcome will be. It will no longer be a design process." (Nelson & Stolterman, 2012, p. 33)

Traditional scientific research tends not to impact the researcher on such a personal level. Research outcomes are specifically based on unbiased researchers. When focusing your efforts on creating a bridge between lived experience and theory, researchers need to be more empathic and lean into the experiences of others. Seeking *whole* knowledge is a balance of what is *true* (scientifically provable) and what is *real* (a person's experience) and directs the designer to develop a deeper felt sense for and understanding of others (McDonagh, 2015, p. 422).

The Disability + Design course (established 2008) is based on empathic design research and aims to bring together design students, non-design students and students (from any discipline) with disabilities. It brings

the students together as equals by elevating the value of the diverse range of lived experiences beyond the typical person. The students are encouraged to embrace the development of the new norm, those living with a different lived experience. By expanding the students' empathic horizons through experiencing discomfort, vulnerability and frustration with activities of daily living (e.g. eating, walking and grooming) (Woodcock et al., 2017), they develop a deeper understanding of other people through their own experience. This bridges the gap between themselves and others. Challenges become more relatable (Hansen & Philo, 2007). Another person's experience becomes relevant to them. Two student activities are shared that highlight 1) the levelling of the classroom and 2) the physical and almost immediate impact of analogue empathic tools in simulating physical challenges.

Levelling of the classroom
For many courses, the student cohort's profile and ability level tend to be similar. For this course, a diverse range of abilities and design awareness constitute the student group. Therefore, a need arises beyond the typical ice-breaking activities. One of the initial activities that resonates with students regardless of their abilities is the self-portrait. Students are required to draw themselves (maximum 5 minutes per task) using (i) their feet, (ii) their less dominant hand and finally (iii) their dominant hand. For those students with limited physical mobility, they can also hold the mark maker (e.g. pen, pencil) in alternative ways (e.g. in their mouth). After overcoming the initial shock of the task, which takes away all the perceived drawing ability of the design students and leaves all the students reimagining how they utilize their bodies for this task, students begin to 'let go' of realistic two-dimensional outcomes. The outcomes are truly remarkable. Non-design students who were told that they did not have drawing skills can draw. Design students who have progressed their academic careers based on their drawing skills have to reassess their notion of the portrait, particularly with the non-perfect portraits they have created. Overall, the activity brings the cohort together more as equals struggling individually with this task. Ultimately, students tend to delight in their unexpected 'foot' and 'less dominant hand' portraits, which often capture the essence of the person more organically than their more typical 'dominant hand' portrait (Figure 3).

Figure 3: Range of foot portraits (from design and non-design students).

Empathic tools
We acknowledge that the only way to experience it is to experience it. However, empathic tools and approaches offer the able-bodied, young and healthy student the opportunity to physically experience challenges with activities of daily living. These tools range from low technology (e.g. tape up an elbow or knee joint with tape to restrict mobility) that is low cost and utilizes commonly found materials within the home and/or classroom to high technology (e.g. Oculus End-of-Life experience software). Low-technology

tools can be made by individual students at home and do not require significant cost beyond materials and time to construct them. Higher technology, such as the Gerontology (GERT) suit, provides a holistic system that can be applied to an individual so that they are experiencing several physical augmentations simultaneously but represents a greater expense (US$4500). The body can accommodate and efficiently adjust to one augmentation (e.g. reduced hearing or reduced vision), but when multiple ones are combined a more immersive experience is achieved (Figure 4). Experiencing the familiar material landscape through the perspective of limited vision, hearing, mobility and strength can result in an almost instant emotional response within the student.

Activities such as the foot portrait and tools such as the GERT suit challenge the student's mindset as they relate to others. Reducing this psychological gap between themselves and the 'other' (e.g. elders or people with disabilities) supports more empathic design outcomes. Through personal challenges (discomfort), understanding and humility develop within and beyond the classroom. Introducing this way of knowing the range of experiences develops a more empathic mindset. Designing for others becomes more aligned with designing for our future selves. It becomes personal and more relevant.
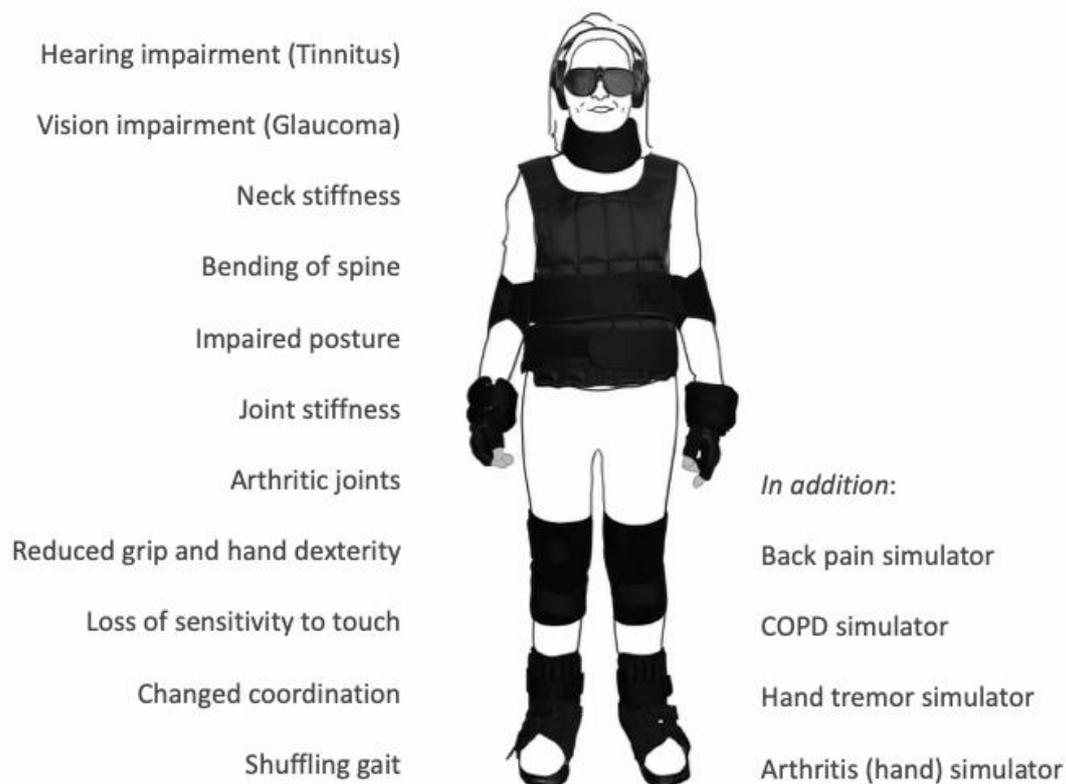
Figure 4: Empathic tools (GERT gerontology suit) simulating range of physical impairments.
COPD: chronic obstructive pulmonary disease.

The value of such experiential learning activities is in the opportunities for learners to go beyond assumptions (felt sense) to more tangible ways of understanding (felt experience). Care needs to be taken, as many students have not experienced physical vulnerability (diminished vision, hearing or mobility), and conducting these activities within a safe environment (e.g. a classroom) and avoiding potentially harmful (activities of daily living) activities (e.g. making hot beverages) needs to be thought out. These activities are time-consuming and require planning and resources. However, overall, the benefits are significant to the individual, especially if they reflect upon their experience. When communicating through speaking out loud to others, they will generate and acknowledge the meaning they create and why it is of value to them personally and ultimately professionally as designers going forward.

Conclusion

The development of activities for students that prompt critical thought and potential discomfort capture a person's understanding of a limit situation. Other ways of doing this are through a visual map, such as an empathy map or journey map, that students use to gauge what they have learned through the learning process. It enables them to reflect on the points of discomfort and acknowledge what they have learned. These activities allow students to reflect on the work they conducted over the semester, reflection being "the process of critically assessing the content, process or premise(s) of our efforts to interpret and give meaning to an experience" (Mezirow, 1991, p. 104). Reflection is vital because, as Siegel and Dray observe, "The pressure to develop design sprints for students to work through does not allow them to develop thoughtful final deliverables where they can conduct secondary and primary research to developing innovative solutions" (p. 82). Learning is a social interaction that takes place through a combination of different processes in the body (genetic, physical and biological) and mind (knowledge, skills, attitudes, values, emotions, beliefs and senses). An experience is therefore interpreted cognitively, emotively, or practices and integrated into a person's biography, resulting in greater self-awareness (Jarvis, 2009).

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