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# HOW HUMAN-CENTERED DESIGN AFFECTS THE WORKPLACE

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HOW HUMAN-CENTERED DESIGN
AFFECTS THE WORKPLACE


A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Arts


Alexandra H. Brigham


College of Performing and Visual Arts
School of Art and Design


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This Thesis by: Alexandra H. Brigham

Entitled: *How Human-Centered Design Affects the Workplace*

has been approved as meeting the requirement for the Degree of Master of Arts in College of Performing and Visual Arts, Program of Art and Design

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ABSTRACT

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This qualitative study was designed to explore the impact a workplace environment has on employees' well-being and productivity. The research identified the themes of flattening, perception, unflattening, and well-being from a multidisciplinary approach including art education, fine art, architecture, medicine, philosophy, and science. Flatness is a state, a behavior that occurs when human perception and consciousness are narrowed, blocking sensory information that is not pertinent to a current task. Behavior that is perpetuated by ingrained societal systems and exacerbated by personal, professional, and financial stressors that can impact the human experience. Flattened areas are addressed in this study through a human-centered design approach that used phenomenology as a framework for analysis. Awareness developed from challenging perception, encouraged a process of unflattening toward well-being. Interpretation of themes found in the Chapter II Literature Review were used to conduct a study at a body therapeutics clinic utilizing a design-based research method that focuses on problem solving using an empirical process control procedure of (1) analyze, (2) plan, (3) design, (4) build, (5) test, and (6) deploy.

A phenomenological attitude was exercised in observing and analyzing results of participant responses to the change of space and their altered

perceptions. The design interventions solved functional issues for the business using iterative methods planned and carried out by the participants and facilitated by research directives. The findings aligned within the themes of flattening, perception, unflattening, and well-being and increased human-centered design benefits of productivity, creativity, collaboration, self-agency, and well-being in and out of the workplace. This research provided new data which can be used to understand how participants may react to human-centered design interventions in an established work environment.

DEDICATION

I dedicate this thesis to Dustin. Thank you for being there for me and loving me, every step of the way. Through this difficult journey you offered perspective while embracing mine. I acknowledge my thesis committee, Dr. Connie Stewart, Dr. Donna Goodwin, and Professor Michael Lemke for guiding me through this journey. I began with focusing my thesis topic on relaxation rooms and Connie, Donna, and Mike helped me find the root of my interest, where it came from, and how to interpret it. Connie, thank you for helping me find rhizomatic connections. Donna, thank you for repeating steps and giving me pep-talks in writing; I still look at them every day. Mike, thank you for reminding me to keep it simple and to be okay with unexpected results. I am grateful for the opportunity to have been mentored by three empathetic individuals of distinguished scholarly achievement. Their experience and perspectives shaped my experience. Researching this topic and the mentorship along with it has changed my life by enhancing my perception of space and awareness as well as my own well-being and that of others.

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INTRODUCTION

**Rationale**

*Traveling Still* (see Figure 1*),* an installation I designed in graduate school

was the impetus for my thesis. A relaxing sensory art installation experience I

curated during finals week on the University of Northern Colorado (UNC) campus

in the fall of 2017. I installed a plush grey carpet in the cement floored room.

Natural light from the large windows was blacked out and covered by 12-foot-

long linen panels that encircled the room, draping over the cement brick walls,

and gathering at the floor. The room was filled with the scent of dried lavender

that had been rolled into the carpet, poured into bowls and drawstring bags that

were placed around the room for participants to take with them. Ethereal sound

was integrated to develop a calming atmosphere. The space was transformed

through ambient lighting by a water reflection projector placed in the middle of

the room, creating a focal point of light on a wall of linen.

*Figure 1.* Alex Brigham*, Traveling Still,* 2017*.* Sensory Installation*.*

The installation came from a personal need during my first semester on campus; a place to take a break in-between classes from the everyday grind. My focus was to take students out of their daily routine and environment by developing a space that increased awareness of one's own senses and perception.

The positive feedback from my installation was overwhelming. Students found me throughout the show and years later to express their gratitude, "I could smell the fresh cut grass after I left; scents were stronger; I feel that my stress is gone, and I can handle finals with confidence; the air feels different in here; this feels like a sanctuary for us; I feel respected and cared for." Students held yoga classes in the room, others studied, some slept, others cried, and professors held

meetings in the space. The success of the installation was the springboard to my thesis, the need for human-centered design (HCD) in and out of the workplace.

The spark for my inquiry and the installation *Traveling Still*, came from a course reading assignment. A philosophical study conducted by contemporary artists Robert Irwin, James Turrell, and National Aeronautics and Space Administration physicist Dr. Ed Wortz in 1968 for the Art and Technology Program of the Los Angeles County Museum of Art (Weschler, 2008). The study focused on human's sense of environment and the perceptual sense of that environment (Weschler, 2008).

The trio's inquiry is what 20th century philosopher Edmund Husserl (1913/2014) refers to as phenomenology, the human consciousness of pure experiences and objects within the horizon of perception. They chose to test their awareness of perception with an anechoic chamber, a room completely devoid of sound and light (Weschler, 2008). Alert to their presence in and out of the chamber, the group had experienced what they called a drastic *world shift* in perception after being in the chamber (Weschler, 2008). After having had the same intense world shift, the three men devised a round of experimental tests involving 25 volunteer subjects, almost all attested to similar perceptions (Weschler, 2008). Irwin described that world shift as:

> For a few hours after you came out . . . you really did become more energy conscious, not just that the leaves move, but that everything has a kind of aura, that nothing is wholly static, that color itself emanates a kind of energy. You noted each individual leaf, each individual tree. You picked up things which you normally would block out. I think what happens is that in our ordinary lives we move through the world with a strong expectation-fit ratio which we use as much to block out information as to gather it in- and for good reason, most of the time; we block out information which is

not critical to our activity. Otherwise we might become immobilized. But after a while, you know, you do that repeatedly, day after day after day, and the world begins to take on a fairly uniform look. So that what the anechoic chamber was helping us to see was the extreme complexity and richness of our sense mechanism and how little of it we use most of the time. We edit from it severely, in time to see only what we expect to see. (Weschler, 2008, pp. 133-134)

I felt a deep connection with phenomenology, the meaning of space, objects, and the impact they have on human consciousness. For the first time there was an actual term to define the concepts behind my work as an artist. As a working artist I explore different media and techniques to create a positive experience for myself and for others using elements of space, shape, color, light, composition, sound, and smell. Phenomenology became the framework of my inquiry to cultivate healthy environments.

I am interested in facilitating attention to the physical design of the work environment by using elements of HCD. HCD can ignite benefits of productivity, creativity, collaboration, self-agency, and well-being in and out of the workplace.

HCD is centered around problem solving in businesses, designing for people (Clements-Croome, 2018), and has the potential to be implemented across multiple platforms: businesses, schools, government, and homes. I am interested in HCD applied to the physical work environment in a body therapeutics clinic. Elements of layout, lighting, art, greenery, private space, clean air and water, scent, and sound were used to promote productivity, creativity, collaboration, self-agency, and well-being. Professor Emeritus of Architectural Engineering from the School of the Built Environment, Derek Clements-Croome, states that, "The physical environment sets the landscape and this can enhance an individual's work by putting people in a better mood,

whereas an unsatisfactory environment can hinder work output" (2018, p. 41). This research was built on the assumption that by developing an awareness of how the aesthetic appearance of space and objects in our work environments impact our mood and perception, we can cultivate quality built environments that put humans' intrinsic needs at the center.

## Background

My interest in bringing awareness to human well-being resulted from my career experience as a decade long free-lance film industry professional. I noticed a drastic shift in my perception of the career I loved, right when it was skyrocketing. I took a step back and looked at my world. I reflected on past experiences, knowledge attained, and skills mastered. What had caused me to suddenly question my dream job?

Long hours of working in high stress environments, constant creative problem solving paired with no routine, guaranteed work, time off and no sleep, had caused me to burn out. I loved my job more than I loved myself. I started to see myself changing at a fundamental level, relating to Irwin's reflection in the anechoic chamber, I was blocking out information that was not critical to my activity (Weschler, 2008). I did not have time for family, friends, vacations, and life experiences outside of work. I could not risk missing a gig. Stepping back and acknowledging my new reality led me to make one of the hardest decisions in my life, to choose my well-being over a career that I loved. The choice to move out of state was a challenge for myself to start over and forge a new path without the temptations of the familiar. I was looking to expand my knowledge in the art world

and take care of myself mentally and professionally. Applying to graduate school was a way to forge the path, when I was still questioning what the path could look like.

The graduate program initiated a self-reflection process of my experiences that shaped my research topic. During the time I was forming my thesis, my Dad began battling anxiety, depression, and insomnia. According to the nonprofit organization Mental Health America (2019), "many employees are unaware they have depression . . ." (para. 3). A vice president of an international corporation, my Dad was not comfortable seeking out help, "Often times a depressed employee will not seek treatment because they fear the effect it will have on their job and they are concerned with confidentiality" (Mental Health America, 2019, para. 3). The events my Dad and I went through, led me to focus my research topic on the workplace environment and how designing spaces using HCD can change workplace experiences and alter our perceptions.

## Research Question

Q1    How does human-centered design affect the workplace?

The time I have spent in UNC's Master's in Art and Design and K-12 Visual Arts Programs gave me the tools needed to harness my past career experience and skills to shape my thesis inquiry. This question was examined within the themes of flattening, perception, unflattening, and well-being using phenomenology as a framework for analysis.

**Definition of Terms**

Human-Centered Design: A method of enhancing the physical design of

business spaces by incorporating people first to increase well-being and

productivity in their employees (Clements-Croome, 2018; Krahnke &

Gudmundson, 2018).

Phenomenology: A philosophical study founded by Edmund Husserl in the 20th

century, "is the study of the human experience and of the ways things

present themselves to us in and through such experiences" (Sokolowski,

2000, p. 2).

Design-Based Research: A type of research methodology used in educational

sciences, founded on three motives that Akkerman, Bronkhorst, and

Zitter's (2011) study, establish as ,"conducting research, creating a

useable design, and establishing sustaining changes in the field" (p. 422).

This process will be used at the body therapeutics clinic to implement

HCD in the workplace.

Empirical Process Control: The procedural lens applied in the study using (1)

analyze, (2) plan, (3) design, (4) build, (5) test, and (6) deploy. This is an

observational and experimental problem-solving method working in fact-

based experience and adaptation (Akkerman et al., 2011).

Flatness/Flattening: Will be used as Sousanis describes, "this flatness is not

literal…. this is a flatness of sight, a contraction of possibilities…. this is

how it is" (Sousanis, 2015, p. 6-7). Flattening is an identifying behavior

that is perpetuated by ingrained societal patterns exacerbated by

personal, professional, and unpredictable events where you may find yourself just going through the motions, the day-to day. Human perception becomes flattened in this state.

Perception: Defined by Sokolowski (2000) explains, is your interpretation and meaning you assign to objects, people, and experiences.

Unflattening: Inspired by Sousanis's (2015) graphic novel, *Unflattening,* is a process of developing an awareness by challenging our perception of space and ourselves in relation to the world. Acknowledging the flatness begins the process of awakening, unflattening.

Well-Being: A broad and dynamic concept defined by Bowden (2018) as, "Well-being emerges from the physical, psychological, social and environmental factors that influence our view of ourselves in the context of the world around us. These factors form the basis of each individual's perception of their well-being" (p. 166).

CHAPTER II

LITERATURE REVIEW

**Introduction**

The purpose of this Literature Review is to inform my thesis inquiry of the impact human-centered design (HCD) can have on the workplace. I was interested in furthering the understanding of how HCD can solve problems while increasing well-being and satisfaction in and out of the workplace (Clements-Croome, 2018). I organized the research through themes of flattening, perception, unflattening, and well-being and explored different perspectives to support these themes. I focused on certain factors that can contribute to flattening behavior in and out of the workplace. Perception was explored through the study of phenomenology and the importance of the human sensory response to environmental factors, and how HCD interventions can play a role in changing our perception. Confronting the impacts of flatness and changing our perception can begin a process of unflattening. Well-being can be achieved through unflattening by putting the human at the center of the business design and may potentially increase productivity, creativity, collaboration, and self-agency.

**Flattening**

Flatness is a state, a behavior that occurs when human perception and consciousness are narrowed, blocking sensory information that isn't pertinent to a current task. The behavior develops when human needs and awareness aren't

at the center of the workplace or at the home. In this work I analyzed factors that

can contribute to flatness and how our embedded societal and nurtured

perceptions cultivate individual and societal flatness.

Artist and researcher Nick Sousanis's graphic novel, *Unflattening* (2015),

a dissertation formatted as a comic book, illustrated flatness in society (see

Figure 2) and subsequent daily life as:

> We walk in paths worn down by those who came before us. Each of us
> arrives midstream, joining a procession so entrenched as to appear as
> that's just how it is. From deep within the grooves, it's hard to imagine
> people just like us set it all in motion. (Sousanis, 2015, p. 107)
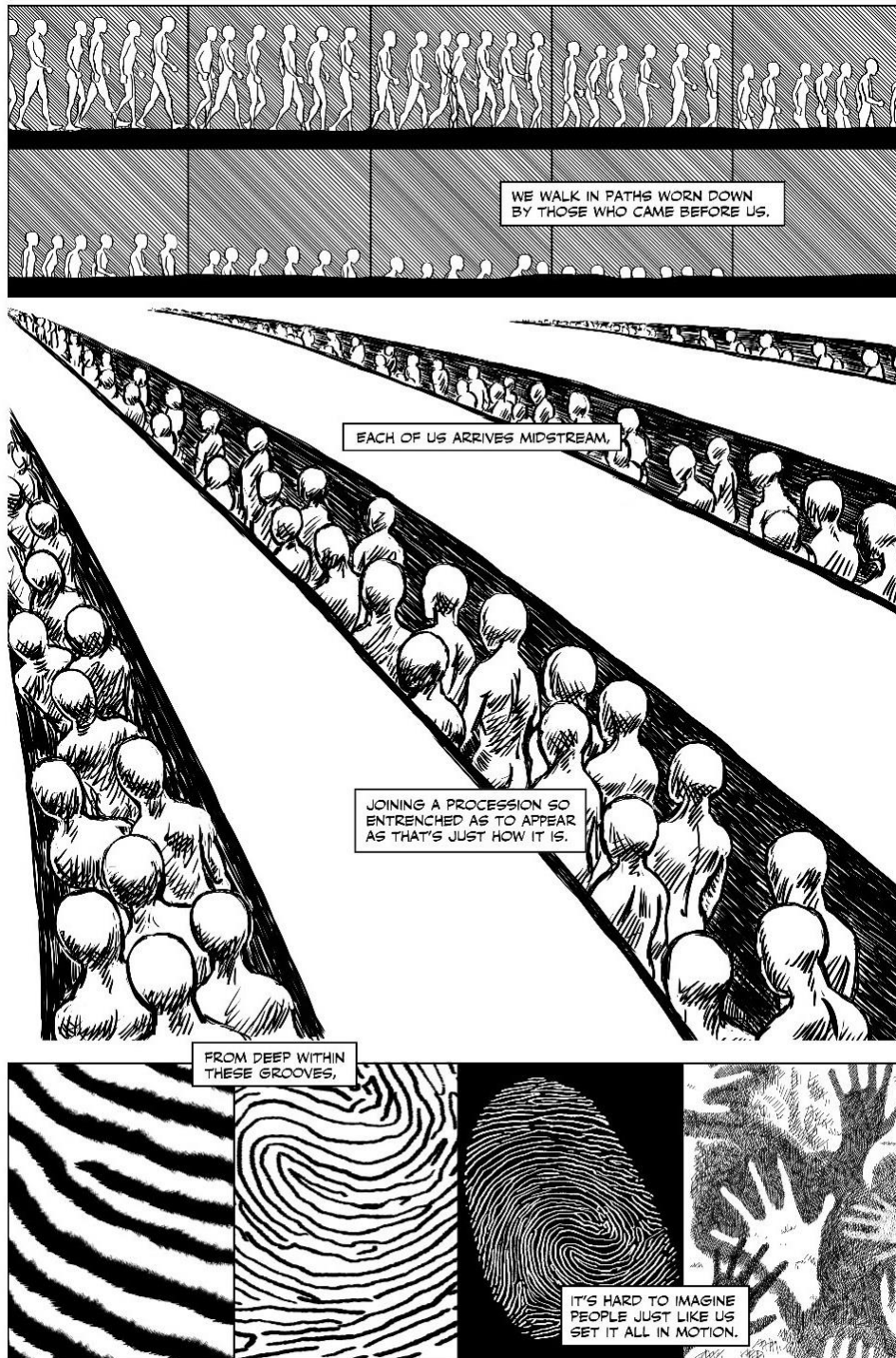
*Figure 2. Unflattening*, visual interpretation of flatness (Sousanis, 2015).

Flatness is a result from past innovations set in motion by those before us, perpetuated by us without knowledge (Sousanis, 2015). This is *how it is*, is a loss of inspiration and the unique, a rut we may find ourselves in, going through the motions. We were born into an established system with norms and expectations already in place. Flatness can be seen in our educational system, home, workplace, and social environments that have streamlined human consciousness through a form of standardization.

Standardization of the human experience begins at a young age. Throughout our education, according to Krahnke and Gudmundson (2018), we have been taught information and attained knowledge as separated subjects in a silo model. Krahnke and Gudmundson (2018) explain that, as we grow, the silo model follows us into the business world and has disconnected the way we think, communicate, organize, and how we view the world. Sousanis (2015) illustrated the silo model in the business world as anonymous human beings in cubes, disconnected from one another and the world, "when we stop questioning, we become transfixed, as if by Medusa's gaze rendered inanimate, flat . . ." (Sousanis, 2015, p. 110).

Over a century ago the workforce was mostly outdoor manual labor. Timm, Gray, Curtis, and Chung (2018) and Clements-Croome (2018) compare how people now spend around 90% of their time indoors and over 75% of those people are considered knowledge workers. Knowledge workers, Hanks (2018) explains, are people such as: scientists, engineers, computer programmers, and doctors that use knowledge as a skill, "thinking for living" (p. 495). Timm et al.

(2018) acknowledge the health implications for this deviation in the work

environment, resulting in less physical activity, and time in nature.

Less physical activity and time in nature has created a new mindset. The

nine to five, the grind, and the place we cannot wait to leave? The workplace. Let

me paint a picture of beige walls and cubicles, motivational posters, fluorescent

lights, and a general lack of artistic aesthetic. This does not describe every

workplace, it can be a feeling, or a rut one may find themselves in (Sousanis,

2015). Clements-Croome (2018) indicates that the average worker now sits at

their office desks from 7 to 15 hours a day. In recent years, research collected

has shown that stressors in the workplace are odors, light, air quality,

temperature, lack of art and greenery, lack of privacy, clutter, and an inflexible

space (Clements-Croome, 2018).

Workplace aesthetics according to Krahnke and Gudmundson (2018) and

Clements-Croome (2018) influence an employee's overall health, stress, anxiety,

productivity, and creativity. "Many work offices and factories are sterile work

environments in which the employee has no opportunity to create, display, or in

any other way express their need for beauty" (Krahnke & Gudmundson, 2018, p.

563). Some organizations still find it difficult to consider soft aesthetics necessary

when constructing a building or starting a business as it seems extra and doesn't

serve the bottom line (Krahnke & Gudmundson, 2018).

## Perception

I approached the concept of changing our perception through the study of

phenomenology by addressing and questioning the connection human senses

have to the environment. How can changing a space through design and art interventions potentially alter our perception by engaging the senses and stimulating human awareness? Changing our perception from a flattened state is a journey, Sousanis (2015) describes as, "the ways of seeing put forth are offered not as steps to follow, but as an attitude-a means of orientation-a multidimensional compass, to help us find our way beyond the confines of "how it is" . . ." (p. 46).

Founded in the early 20th century by philosopher Edmund Husserl, "Phenomenology is the study of the human experience and of the ways things present themselves to us in and through such experience" (Sokolowski, 2000, p. 2). Husserl (1913/2014) identified two attitudes of human perception, Sokolowski (2000) interprets, (1) natural attitude, our everyday real experiences of weather, stars, animals, and plants that we take for granted, (2) phenomenological attitude happens when we reflect on the real-world by pulling back from the natural attitude. Suspend our beliefs of objects and experiences. Contemplate and question the intentionality of everything in the natural attitude, our world belief, and, "what it is to be a participant in the world . . ." (Sokolowski, 2000, p. 48). Intentionality in phenomenology is used as our theory of knowledge, each act of consciousness is focused towards an object of some sort, our relationship with it, and whether it serves a function or an aesthetic need (Sokolowski, 2000). The phenomenological application in developing a space by questioning one's perception, is a step towards developing awareness.

Human awareness is comprised of all our senses working together to create an encompassing experience (Clements-Croome, 2018). The senses provide us knowledge about where we are by what we smell, see, hear, taste, and touch, impacting our biological response, physically and mentally (Clements-Croome, 2018). Architectural engineer Clements-Croome (2018) explains that the senses and other soft factors such as aesthetics, greenery (biophilia), social environment, and the climate of an organization all contribute to our human response to an environment. Our sensory response may have a negative or positive impact on our engagement, productivity, and creativity in the workplace depending on our perspective of beauty, and how we interpret the world (Sokolowski, 2000). Challenging our perception by awakening the phenomenological attitude, we notice appearances of objects, spaces, and meanings of interpreted experiences. Operating in the phenomenological attitude, we would notice the leaves refracting light on a walk into work, when we used to block out the leaves all together as our focus was getting to work.

Art is a visual way to alter our perception of space. International multi-media artist and activist Olafur Eliasson, explores the perception of the human experience by using space as his medium through thoughtful contemporary art interventions. In 2003, Eliasson transformed popular tourist destination, Turbine Hall of the Tate Modern in London (see Figure 3), for *The Weather Project* (Eliasson & Ursprung, 2012). Normally a place alive with noise and light, Eliasson blacked out the hall and lined the ceiling with mirrors. He constructed a hypnotizing bright glowing orb, resembling the sun at the end of the hall. The sun

cast a golden light in the hall and was illuminated and refracted by artificial mist,

creating a haze-like effect.
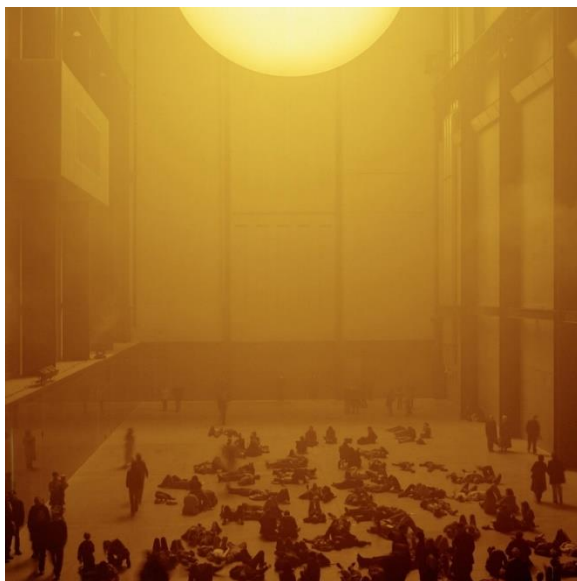


*Figure 3.* Olafur Eliasson*, The Weather Project*, Tate Gallery, London (Marlow, 2003)*.*

Ursprung described the installation:

What I saw was so unexpected that it left me speechless for a moment…. you now immediately entered a dark space….an awed silence reigned. Many visitors laid on their backs to look at their reflection on the ceiling…. Others like me, approached the great disc in amazement…. The work of art demanded that I react. It forced me to question who and how I, as an art historian, should deal with it. It is so immediately accessible that it neither requires explanation nor clarification . . . (Eliasson & Ursprung, 2012, p. 17)

Eliasson is interested in activating one's awareness of the physical space

around them. He creates interventions of what appears to be natural phenomena

in unnatural settings, questioning our awareness of the weather around us. The

reaction to the space is immediate and mesmerizing while encouraging self-

reflection and connection, through exploring our individual aesthetic experience,

and the intentionality within the horizon of our perception (Eliasson & Ursprung,

2012). Changing our physical space can alter our perception and take us into a phenomenological attitude; engaging a new understanding of ourselves and the interpretation of our experiences through the senses.

## Unflattening

The unflattening process in corporate society began when workplace aesthetic was linked to increased reports of stress, depression, and rising cost of healthcare according to Timm et al. (2018); who have found along with other reports that, "only 33 percent of employees in the United States report being engaged at work . . ." (p. 468). Currently, "depression ranks among the top three workplace problems after family crisis and stress . . ." according to national non-profit Mental Health America (2019, para. 2). The rise in the cost of healthcare from increased depression and anxiety results in higher absenteeism and lost productivity in the workplace (Timm et al., 2018). Growing awareness of the importance of employees, "physical, mental, and social well-being" (p. 468) has been linked to the organizations bottom line. The increased reports of mental health in the workplace have begun changing organizations and workers perceptions. Identifying the impact of flattening behaviors can begin the process of unflattening, from developing a new awareness towards finding well-being in and out of the workplace by challenging our perception.

Advancements in neuroscience have begun to show the impact the built environment has on our brain (Clements-Croome, 2018). Neuroscientists have begun to work with architects and artists in developing environmental designs that address workplace stressors, facilitating people to operate at their, "fullest

within those environments" (Clements-Croome, 2018, p. 5). Clements-Croome

(2018) research further asserts that in the last few years, construction

professionals have been directing attention to occupant's health in the design of

healthy building construction plans. The benefits from healthy buildings have

seen a reduction in the cost of healthcare, increased employee satisfaction,

lower absenteeism, and higher employee productivity (Clements-Croome, 2018).

Larger organizations such as Google, Facebook, Spotify, and Groupon

have started designing work environments to be engaging, comfortable, and

relaxing (Fortune, 2016). Work environments range from: biospheres for tree

house offices and meetings, rock walls, lounges, restaurants, work out centers,

outdoor landscaping and access, breakrooms, game rooms, music rooms, art

rooms, and nap pods. Providing a variety of office layout options has been found

to increase self-agency, creativity, productivity, socialization, and collaboration

among workers (Welch, 2018).

The standardized workplace needs to be un-learned and rebuilt to

cultivate an open, engaging, and collaborative community where, "people are an

asset, not just a cost" (Bowden, 2018, p. 163). Employees should be given the

opportunity to learn and grow in a sustaining and healthy work environment

(Krahnke & Gudmundson, 2018).

We spend over half our lives working (Timm et al., 2018). People want

their environment, whether it is an office, school, or home, to be a part of a

diverse range of multi-sensory experiences that elevate the time spent there

(Clements-Croome, 2018). The human mind has great potential to connect,

relate, and transfer information. Stimulating the senses, "are also channels which ignite the imagination . . ." (Clements-Croome, 2018, p. 5), the mind needs to be rewired for a new way of thinking.

**Well-Being**

The research previously discussed supports workplace well-being as a fundamental building block for a healthy and motivated workforce. The following research discusses the variety of ways in which well-being can be increased when elements of HCD are implemented in the workplace.

The positive results from organizations focused on employee well-being has influenced the approach of the workplace in a human-centered world view (Krahnke & Gudmundson, 2018). Human-centered world view concentrates on holding essential values like well-being, community health, and advancement of human interest (Krahnke & Gudmundson, 2018). Clements-Croome (2018) additionally advocates that individuals working in an organization want to feel supported, motivated, creative, and confident in meeting personal and professional goals, learning and growing in a place where their role is recognized, and makes an impact.

The incorporation of HCD in the workplace involves enhancing the workplace environment to accommodate humans' intrinsic needs and promote well-being (Clements-Croome, 2018). HCD interventions provide workers access to natural light, outdoor space and greenery indoors, artwork, color, clean air and water, ergonomics, support and social interaction from colleagues, private and collaborative spaces (Clements-Croome, 2018; Krahnke & Gudmundson, 2018).

The human body needs to move to remain healthy, engaged, and productive, meaning, "The senses need stimulation to react to, otherwise boredom sets in" (Clements-Croome, 2018, p. 23). The stimuli in our environment creates a multi-sensory experience for our body and mind, which can enrich the places we work in, generate creativity, and satisfaction within the workplace (Clements-Croome, 2018).

The implementation of the arts: visual art, music listening, reading, creative, writing, dance, and art activities began to take root in the healthcare field in the 1990s (Wilson, Bungay, Munn-Giddings, & Boyce, 2016). There is more current research on the benefits of art interventions on staff and patients in the healthcare field than arts' impact on the corporate workplace (Lapum, 2018; Smiraglia, 2014; Wilson et al., 2016).

Reviewing twenty-seven international studies of the impact that arts intervention has on healthcare staff and patients, Wilson et al. (2016) found that arts interventions positively affected a patient's mood, stress, pain levels, and sleep. Wilson et al. (2016) explained that the staff believed that the art interventions, "decreased stress, improved mood and job performance, reduced burnout, improved communication and patient/staff relationships, improved the working environment, and improved well-being . . ." (p. 90). Some staff reported that displayed art made the wards feel more like a home and less like a sterile environment and felt an increase of well-being and job satisfaction (Wilson et al., 2016).

One of the first qualitative studies, "*Artworks at Work: The Impacts of Workplace Art*" was conducted by Christina Smiraglia from Harvard University. A rotating art exhibition program was organized at a non-profit organization that featured the work of K-12 students. Smiraglia (2014) gathered data from administrators and employees regarding their feelings about the presence of art in the organization.

The researcher observed an increase in social interaction, "Most of the social interactions around the exhibition involved discussion between colleagues" (Smiraglia, 2014, p. 288). One employee expressed, "the collection help[s] us make contact, provides a space for conversation that didn't exist before . . ." (Smiraglia, 2014, p. 288). The exhibit provided the employees a space to interact that was separate from the work environment, a place to explore, and socialize.

The effect Smiraglia (2014) observed was the artwork's enhancement of the workplace environment, participants described a, "sense of beauty" (p. 288) in the office and, "it gives me a good feeling about the organization….brings color and creativity into our work space . . ." (p. 288). The presence of artwork also induced positive emotional responses of joy, wonder, and inspiration for most members in the organization (Smiraglia, 2014). Members also reported the art started an inner dialogue, a thought process that pushed them out of their comfort zones intellectually (Smiraglia, 2014). The study concluded that employees and board members felt positively impacted from the student artwork. The art promoted social interaction, improved the work environment, stimulated

emotional responses, and, "facilitates personal-connection-making and fosters learning" (Smiraglia, 2014, p. 287).

**Conclusions**

The literature reviewed above was the work of researchers in the fields of art education, fine art, architecture, medicine, philosophy, and science. This literature provided the relevant support to conduct my study and drove the development of my thesis question. The research I presented in the themes of flattening, perception, unflattening, and well-being allowed me to see from different perspectives. It furthered my understanding of the impact that our physical environment and objects within our environments can have on our physical and mental well-being in and out of the workplace. This knowledge was used to facilitate HCD implementations in a workplace environment to further study the benefits of increased productivity, creativity, collaboration, self-agency, and well-being in the workplace.

The need for human well-being in and out of the workplace is crucial for the future success of organizations. According to Krahnke and Gudmundson (2018) success will be dependent on the organizations ability to change and transform itself to stay in business. Success is dependent on members of an organization having, "the skill sets necessary to learn, to innovate, and to be creative . . ." (Krahnke & Gudmundson, 2018, p. 559). The transformation of the work environment through HCD is a tool that can be used in developing new ways for human beings to thrive in and out of the workplace.

CHAPTER III

METHODOLOGY

**Methods**

This chapter outlines the methodology that was used to conduct my

research and ultimately to gather data in support of my thesis question. The

study was conducted in a body therapeutics clinic in downtown Denver,

Colorado, and sought to explore the effect of human-centered design (HCD)

implementations in the workplace. I used three motives of design-based research

(DBR) identified by Akkerman et al. (2011) and The Design-Based Research

Collective (2003) as my methodology. The term *motive* used in DBR, refers to

the *why* behind the research. The interest to understand how elements of HCD

could enhance the experience of the participants who work in the space and their

clients that use the space, was at the center.

The first design-based research (DBR) motive is *conducting research on*

*design purpose* (Akkerman et al., 2011). I used this first motive to pursue my

interest of human well-being in and out of the workplace. My design purpose was

supported through the research of principles and applications of human-centered

design (HCD) in the workplace; utilizing multiple viewpoints that included

architectural, artistic, medical, philosophical, and case studies within these

disciplines. Themes developed over the course of my research were discussed in

Chapter II Literature Review and organized by flattening, perception, unflattening,

and well-being. The themes were a way of constructing a narrative to aid in understanding the impact that the physical environment has on well-being in and out of the workplace. The improvement of the workplace environment has the potential benefit of boosting productivity, creativity, collaboration, self-agency, and well-being.

The second design-based research (DBR) motive is attention *to creating a useable design* (Akkerman et al., 2011). The context for creating a useable design in the body therapeutic clinic was site and vocational specific, which influenced the design process and its purpose. The iterations of human-centered design (HCD) interventions in the workplace was to provide participants with the tools to create a useable design. Their goal was to create a unified business space that was a professional and functional environment for all participants to conduct their separate business.

The third design-based research (DBR) motive is *establishing sustaining changes in the field* (Akkerman et al., 2011). The process of the design was to solve real-world problems through establishing change in practice. The third motive developed from extended experience and informal interactions with participants in the field and facilitating the participants during the design process (Akkerman et al., 2011). Giving freedom in design choice to the participants through challenging their perception of space allowed them to build self-agency in the workplace and their own practice through engaging in creative problem-solving. The data collected provided further information in understanding the

complexities of DBR and implementing human-centered design (HCD) in an operational and established work environment.

The second and third motive of design-based research (DBR) were conducted using an empirical process control (EPC) as a lens to guide my steps in implementing the design aspects for human-centered design (HCD) in the workplace. Akkerman et al. (2011) explain EPC in DBR, as creating a sequential and constructive process that is iterated before and during the study to improve the outcome of the final product. I used the sequential terms of EPC: (1) analyze, (2) plan, (3) design, (4) build, (5) test, and (6) deploy as my procedural method for HCD interventions. The process used, "observation and experimentation instead of detailed, rather upfront planning processes . . ." (Visual Paradigm, 2019, para. 2). I hoped through the EPC mindset to, "expect the unexpected" (Visual Paradigm, 2019, para. 2), understand what Akkerman et al. (2011) described as the complexities of DBR, and the experimental nature of EPC. I sought to understand how to implement HCD in future environments to benefit the employee as an individual, the workforce, and the economic success of a business.

Data were collected from in-person discussions, photos, text messages, and emails using a phenomenological mindset. I observed the participants interact in their work environment while applying a phenomenological attitude, Sokolowski (2000) explains, "we contemplate the involvements we have with the world and with things in it . . ." (p. 48). I looked to see if there was a world shift as described by Irwin (Weschler, 2008).

**Procedure**

I received Institutional Review Board (IRB) approval for my research project (see Appendix A). The data were collected over a period of 16 weeks beginning in the fall of 2019 and ending in December of 2019.

The first design-based research (DBR) motive, conducting research on my design purpose, was implemented using empirical process control (EPC) methods (1) analyze and (2) plan through conducting an initial in-person meeting with the participants at the clinic. I explained the research procedure, conducted a walkthrough of the business suite, and created a plan with the primary participants for specific human-centered design (HCD) interventions they were interested in implementing. The primary participants wanted to focus interventions in layout, lighting, sound, art, furniture, greenery, and retail space.

The second design-based research (DBR) motive, creating a useable design, was implemented using empirical process control (EPC) methods (3) design, (4) build, and (5) test. The process was iterated several times, altering the work environment through human-centered design (HCD) interventions of layout, lighting, sound, art, furniture, greenery, retail area, and break space. The repetitious nature allowed for the participants to find a design that was functional, solved workplace issues, and was aesthetically pleasing.

The third designed-based research (DBR) motive, establishing sustaining changes in the field, was implemented using empirical process control (EPC) method (6) deploy; where perceptions of space had possibly changed, potential

benefits of well-being could be seen in the participants, and new findings were discovered during the study.

Communication during the study was set up to create ease in our varied schedules and allowed accessibility for data collecting between me and the participants through meetings, phone calls, text messages, emails, and photos. All data were analyzed through the design-based research (DBR) method, using empirical process control (EPC) as a lens, and aspects of phenomenology acted as the organizational framework.

## Participants

The purpose of this thesis was to take human-centered design (HCD) into the workplace. Research was conducted in a body therapeutic clinic in Denver, Colorado. The business suite had three individual business owners operating their unique trade skills to increase body mobility, pain management, and well-being of their clientele. The two primary participants were interested in unifying their business space visually while maintaining their individual practices.

The three female participants in the clinic ranged from 30 to 40 years old, and two were primary participants. All participants held various degrees and licensures specializing in body therapeutic techniques addressing physical therapy, body alignment, chronic pain, injuries, emotional trauma, and other conditions. They designed individual wellness solutions to educate their clients about their bodies, giving them the tools to be proactive in their health through providing various treatments to relieve pain and maintain preventive care. All participants signed a consent form outlining the parameters of the research. I

assembled various data collection points from the primary participants that included: phone calls, photos, text messages, email, and in-person interactions to provide an open dialogue through accessible technology in the body therapeutic clinic.

I gathered information from the primary participants that was relative to human-centered design (HCD) interventions. The secondary participant provided constructive feedback on interventions to the primaries. The designs were based on my interventions as facilitator and researcher. The interventions were influenced and carried out by the primary participants A and B, designs were based on their experience and knowledge of their vocational needs.

## Data Collection

I collected several types of data to gain insights into my thesis inquiry: in-person interactions, phone calls, text messages, email, notes, and photos were recorded into bulleted notes in a journal. I directed the implementations of the primary participants by first presenting human-centered design (HCD) interventions in layout options. Then addressed other HCD interventions of lighting, sound, art, furniture, greenery, retail area, and a break space as they came up through the iterations in layout interventions. Our schedules conflicted, so together we decided it was important to make the method easy and accessible for everyone. I collected all forms of communication by date and cataloged photos of the space transforming over an online photo album.

I took photos of the space about once a week to record the process of transformation after each intervention prompt. The primary participants

communicated through video chats, sent me photos, informed me of changes they intrinsically made that were stimulated by the research process. I am not experienced in the trade skills and functional spaces needed for their field, so it was up to them to make the design decisions with me acting as facilitator.

I began with implementation instructions via in-person, text messaging, email, or notes on the front desk asking the participants to address certain human-centered design (HCD) elements or areas in the work environment. The list was short with three to five tasks to accomplish for each week. Although the list was short, the tasks were not easy. The tasks were physically and mentally taxing, ranging from: getting rid of furniture or objects through donation, switching rooms, taking down décor, re-configuring a room, questioning the intentionality of the objects in their treatment rooms and shared spaces, or taking everything out of a room and bringing it back in to work with a blank canvas. The participants would visually record the process from beginning to end of each intervention by sending photos or emails with further inquiries about what they wanted to try next.

I provided the participants with emails containing informational resources that supported the why behind my prompts. Resources for consumer product information in documents that had active links bracketed into specific areas of human-centered (HCD) workplace design they wanted to work on such as: layout, lighting, sound, art, furniture, greenery, retail, and a break space. The documents were an aid to facilitate participants' creative engagement in visually constructing different ways to enhance or alter their space. In the research

design, alterations were made based on participant preferences that worked within their budget and vocational aesthetic needs. The participants in turn would send emails discussing the design idea documents and other ideas that they had discovered or purchased on their own, through my prompts.

Halfway through the study, I began meeting with the participants informally, off the record, not taking notes. The time was spent getting to know one another and talking about what was going on in our lives over dinner. I found this time was the most valuable as it relieved tension between the participants and me. We talked about the study when it came up organically, interspersed between lighthearted conversations, and we worked out any misunderstandings in-person, together, as a team. This tool also made me more present in their lives and workplace, and not just an academic stopping by the office once a week with homework (Akkerman et al., 2011).

I expected to have new findings regarding implementation of human-centered design (HCD) in the workplace; additionally, I hoped to shed light on the complexities of design-based research (DBR) in other contexts, and informal qualitative data collection strategies. Furthermore, I expected the use of HCD in the workplace to increase productivity, creativity, collaboration, self-agency, and well-being through bringing awareness to the work environment. I was intrigued by the possibility of observing a world shift in the participants' perception via the process of physically altering their work environment.

**Data Analysis**

The data gathered from the human-centered design (HCD) interventions were analyzed by layout, lighting, sound, art, furniture, greenery, retail area, and a break space. Changes in participants' perceptual awareness and sense of space through HCD interventions were examined for similarities and differences. Communications from face-to face meetings, text messages, and photo documentation sent to me, indicated a transition in the participants perceptual awareness. The qualitative data were collected and evaluated using a phenomenological attitude for themes of flattening, differing perceptions, unflattening, and well-being. The themes became apparent during my research and helped me navigate a transformational process that stemmed organically from reflection on my personal journey to well-being in and out of the workplace.

Human-centered design (HCD) was implemented to create an aesthetically pleasing and functional work environment; the potential benefits for participants being productivity, creativity, collaboration, self-agency, and well-being. For the purposes of this thesis, productivity was interpreted to include self-agency as a potential benefit stemming from HCD. Data produced by HCD were evaluated for participant benefits as emphasized by Clements-Croome (2018) and Krahnke and Gudmundson (2018) for productivity, creativity, collaboration, self-agency, and well-being.

The iterative nature of the empirical process control (EPC) granted multiple opportunities for participants' perception of their spatial awareness to be challenged. I expected to find different patterns in participants' reactions during

the iterations, although there is little supporting research on how participants react during a human-centered design (HCD) intervention. Identifying the cause of a participant's emotional response and the change in spatial awareness is significant in understanding the effect HCD has on the workplace, and the meaning of space. The current research for HCD focuses on benefits after implementations and how to incorporate it into a new building. This thesis will describe that by integrating HCD, we can enrich our environments and alter our day to day experiences by cultivating meaningful spaces that open us to new perceptions.

## Limitations

Over the course of the study I experienced several limitations that impacted the outcome of my findings and timeline. First, I had to find a business that was willing to take the time and potentially invest money into their space. I built a proposal and sent it out to 12 companies, some I knew personally, others were local, and a few national chains. The proposal drafting, waiting, and seeking out responses took time. I was turned down by all 12 companies due to the organizations not having the time, resources, or because they were experiencing property management issues. Of the 12 companies that rejected my request, three of the companies replied that they might be able to potentially participate in the future when they were in a better position to do so.

The first location that agreed to be a research site, was an old friend in St. Paul, Minnesota who owned a drum shop. The participant had to withdraw when the study was going to begin due to personal reasons. I turned locally to find a

new last-minute location. Losing significant time for research, I reached out to a body therapeutic clinic where I was a client. I personally knew one of the primary participants in the study. I operated on the knowledge that the clinic had recently brought on new independent business owners specializing in a variety of body care activities within the business suite and they were interested in unifying the visual presence of the business.

I also experienced limitations in my design-based research (DBR) methodology. In the past, DBR has been used in educational design research and software development, and from all sources has been labeled as complex and filled with participant opposition (Akkerman et al., 2011). The main motive of DBR is, "finding a solution to a problem, or improving an existing solution . . ." (Akkerman et al., 2011, p. 432). I chose this methodology because the DBR motives of conducting research on design purpose, creating a usable design, and establishing sustaining changes in the field, aligned with my process as an artist and desired design outcomes (Akkerman et al., 2011). I searched for steps and processes in DBR, pulled out information from studies on how to build my design interventions. I read over the impact of implementation in an educational DBR setting outlined by Akkerman et al. (2011) and concluded that their limitations didn't apply to me. I wasn't changing a teacher's curriculum or a classroom. I was changing a workplace where the participants were ready for the change and approved a design plan.

**Reliability and Validity**

Reliability of design-based research (DBR) was not in the results but in the methodology, which is dynamic by nature. I relied on DBR's dynamic methodology and the repetition of empirical process control (EPC) design to achieve desired outcomes. Results were not always stable or consistent due to the participants' previous personal experiences that they brought to the research, and the revisional quality of the process in context to the final product.

The study was influenced by personal experiences that formed my inquiry and resources gathered from various fields supported my findings in substantive validity. The triangulation strategy Creswell (2013) explains, "involves corroborating evidence from different sources to shed light on a theme or perspective" (p. 251). Triangulation was used to establish validity of the findings by using design-based research (DBR), empirical process control (EPC), and phenomenology as a framework. Supported by a multidisciplinary approach that included art education, fine art, architecture, medicine, philosophy, and science I was able to see the positive and negative impacts that the built environment can have from multiple perspectives. This furthered my exploration to work authentically with the participants, understand their process, and the impact that human-centered design (HCD) can have on the workplace.

My plan was originally focused on the benefits of physical human-centered design (HCD) interventions and was fueled by the participants excitement on designing their space together. Validity was examined from each iteration, on-going throughout the study, the process did not follow the outline of the design

method planned, as participants' involvement made sequencing unpredictable. The erratic nature of the process was recorded through what Creswell (2013) points out as prolonged engagement and persistent observation in the field by developing the participants trust. I took the time during the research to get to know the participants one-on-one; learned specific problems and needs of their vocation, and their work environment. When the HCD interventions began, the participants emotional response caused by challenging their perceptions of space became more relevant than the outcome of their physical environment. The member checking strategy was used to determine what Creswell (2013) explains as, "credibility of the findings and interpretations" (p. 252). I emailed the primary participants to member check the analysis of the study to corroborate my findings, provide self-reflections, and point out any missing information or misinterpretations. The participants agreed with the interpretations of the results, how they were personally represented, and the themes of flattening, perception, unflattening, and well-being were addressed as a process that they had experienced. In an email reflecting on the experience after reading the study results, participant A wrote, "I laughed, cried, and felt all of the emotions all over again. Your research has forever changed my views on myself, my living and working spaces, and interactions with others . . ."

CHAPTER IV

RESULTS

**Introduction**

The qualitative findings of this study expanded and refined my

understanding of human-centered design (HCD). I approached the data with a

phenomenological attitude and the findings aligned to the themes of flattening,

perception, unflattening, and well-being. The themes manifested from HCD

iterations of the empirical process control (EPC) procedures (1) analyze, (2) plan,

(3) design, (4) build, (5) test, and (6) deploy. The data collection points center on

primary participants A and B. Participant C provided feedback on HCD

implementations but was not engaged in the interventions themselves. The use

of HCD in the workplace increased productivity, creativity, collaboration, self-

agency, and well-being by bringing awareness to the work environment.

**Flattening**

My research began from a place of flattening. The primary participants

accepted this study, in part, to force themselves to make the time to focus on

their space (see Appendix B for initial layout). All participants operated their own

body therapeutic practices, worked different schedules, and had different

policies. The flattening of the work environment was a result of the participants

being independent owners who don't necessarily need to communicate to be

successful. The participants became isolated as a result of the constant go-go

everyday schedule. Although the participants' businesses were successful, they were flattened by the everyday routine. They had found themselves unable to take the time to grow in the workplace personally, professionally, and present a visually unified business space (see Figures, 4, 5 & 6). This was evidence of flattening and was impeding their personal and professional growth. The data show the impact flatness had on the participants.



*Figure 4.* Front entrance before HCD interventions, fall 2019.



*Figure 5.* Front entrance before HCD interventions, fall 2019.

*Figure 6.* Hallway before HCD interventions, fall 2019

A personal journal entry (see Appendix C for journal transcripts) on my

perception of flattening in the workplace after my initial in-person meeting:

> *The front entrance was cluttered with objects that had no meaning to me. I was unable to interact with the front entrance which also included a waiting and retail area. The layout had me standing in the middle of the front entrance until my scheduled appointment. I thought the couch was inaccessible for all clients given their physical limitations and that some may not want to sit on a couch next to a stranger. There was no common area for staff or a break space, there were two rooms not being rented and used for equipment storage. I proposed the participants discuss designating a break space, so that the participants all had a space to go to in-between clients.*
>
> *I interpreted that participant B had the final say on design decisions in the space because of her ownership of the lease. I understood that all the objects in the front entrance and in the hallways were participant B's. Most of the objects in the space are personal rather than professional and only applied to participant B. Participant A and C had only business cards in the front entrance. I observed participant B as being emotionally responsive to the creativity of the front entrance. I perceived this as excitement connected to her space and her objects. Participant B was willing to compromise on designating a break space but didn't seem as excited as the other participants did. I observed B's excitement plateau as evidence of flattening; she is giving up her authority on the space. Participants A and C showed a passive response to the front entrance. I perceived that the passive behavior of A and C in the waiting room was*

*due to not having creative input or objects in the common areas.*
*Participant A and C exhibited a positive emotional response to the break*
*space, I concluded their positive response to the break space stemmed*
*from the process of creating a new space as a team.*

The length of the study allowed the primary participants to share with me

their personal experiences that they believed had contributed to their perspective

of space. Participant A explained to me that her lack of connection with space

and objects was perpetuated by losing everything during hurricane Katrina and

other past traumas. When asked about her connection to the workplace,

participant A said she did not feel a connection. She felt she was, "renting a

space in someone else's business and didn't feel welcomed or seen as an equal,

professionally." Participant B's business sign hung in the front entrance, her

licensures hung outside A's door, and the aesthetic of the front entrance, gave

clients the impression that participant A and C worked for B. I experienced what

Akkerman et al. (2011) described as, "resistance" (p. 422) to HCD interventions

and, "surprises" (p. 422) from participant B, that were described in their study on

the complexities of design-based research (DBR). To understand participant B's

personality and to guide the design strategy, I scheduled a meeting during which,

participant B became resistant to questions about space. The first layout

intervention had occurred a week before. The front entrance had been re-

arranged, participant B's treatment room was moved to the larger back room,

and a break space had been integrated where B's treatment room was before the

intervention. The resistance B exhibited, made me pull away from directly

interacting with B. Participant A decided to be the point of contact for a while and

the overall result of our action was isolation of participant B. The interaction was

recorded through reflection in a journal entry:

> *I started to challenge the perception of her space by asking her questions about specific objects' purpose in the space and layout choices she made since the first reconfiguration. I began to observe resistance in my line of questioning from participant B. She was not interested in discussing the questions, HCD interventions, or other ideas that I presented to her, the reason being "I hate it, this is the way I have always liked it." Her body language and tone of voice became defensive. She explained that she was having a problem trusting me and participant A to follow through on the design process and wanted to take responsibility for designing her space with my guidance. The interaction was one sided and no solutions were provided that aligned with my research. I felt I was losing authority of my research and B was going to "take it from here." I felt that participant B was going to stall the research process.*

Participant B later revealed that her emotional response during that

meeting was caused by her personal connection to the objects I questioned. The

objects that she used to fill up the space were connected to a failed business

venture that left her alone, holding the lease in the current business suite over

the past year. Participant B edited and published a book over the course of the

research. Participant B brought personal, professional, financial trauma, and

stressors into the research that flattened her daily experience and engagement in

the research.

The data from my initial observations and interactions with the participants

demonstrated evidence of flattened behavior. The participants were not familiar

with each other's personalities because there was little communication between

them professionally and personally before the study. The absence of a break

space and a neutral front entrance left the participants lacking a connection with

the space. It did not represent them or their personalities professionally or

personally. The participants had been isolated from each other professionally

and personally, and the work environment lacked function for all participants, perpetuating disconnection.

Based on the outcomes of the study and from the participants' reflections, I learned that they brought their past experiences into the workplace and the research; furthermore, it presented the question of whether flattening *baggage* could be a starting point for some individuals. Flattening showed it itself to be idiosyncratic, it can happen to anyone, it may be influenced by societal norms or personal and professional stressors that can be unpredictable and slow down HCD interventions in the study of the workplace.

**Perception**

I found that continuously challenging the participants' perception of space by asking them questions, triggered what Husserl (1913/2014) and Sokolowski (2000) refer to as the phenomenological attitude. Their perception of space and how they saw themselves within that space professionally and personally were questioned.

The research began through the HCD intervention of layout. This involved focus on the front entrance, hallways, participant B's treatment room, and designated break space. HCD interventions in these areas included changing the layout of the furniture, removing or replacing decorative objects, and re-arranging retail merchandise and supplies. The iteration of the EPC method of (3) design, (4) build, and (5) test involved the primary participants taking everything out of the room, and then bringing it back in to design the space together. The data

show the unflattening process began when participants' perceptions of space was challenged.

The layout iterations began an internal dialogue for the primary participants, which helped them to understand their individual aesthetic preferences, and began to shift their perception of the space (see Figures 7 & 8). The participants had to voice their own views (self-agency) and collaborate to find a solution for designing the communal spaces of the front entrance, hallway, and the break space. The primary participants collaborative interactions exhibited excitement, frustration, tension, and compromise.

Participant A expressed to B that creating a neutral and functional front entrance and designating a break space would give the participants' a place to store their belongings, eat and rest between clients, and is an essential function for their practice. Participant B agreed to collaborate on a neutral front entrance but asked if they could work with her objects and furniture to begin with, as a solution to saving money. Participant B also agreed to move her treatment room to the large backroom so that the new break space would have a sink and refrigerator to create a communal kitchen area.

*Figure 7*. Front entrance, first HCD layout intervention.



*Figure 8.* Front entrance, first HCD layout intervention.

The designated break space resulted in participant A and C feeling that there was a place where they belonged in the work environment, a place where they had input. Participant B was indifferent to the break space at first but exhibited an awareness of the change in space, and stated after it was implemented, "I would rather rent the space and make money on it. The others really seem to like it, so it can stay for now." The break space resulted in the

participants communicating and interacting with each other throughout the day. The break space became a place to store their belongings, eat, socialize, and provided them a place to work privately at a desk (see Figure 9).



*Figure 9.* The break space after several iterations of HCD interventions*.*

The break space became a storage room during each layout intervention. Participant A made sure it was a functional break space when new layout iterations were tested with some assistance from B. Both primary participants informed me that participant C was generally shy and was beginning to show signs of socializing at work, she looked happier, and reported that she had said, "I am so happy about the break space, I feel much more comfortable during my work day knowing there is a private relaxing space away from my treatment room and the front entrance." Participant C's statement aligned with the research of Clements-Croome (2018), that many office workers want contemplation spaces separate from their work environment.

Participant A showed positive benefits from the HCD layout interventions, exhibited signs of self-agency by starting other interventions, while participant B

took time to adjust to each change. Participant A initiated a free installation of warm LED tube lights. Showed signs of productivity and self-agency by reaching out to the property management company, she began developing a new awareness and ownership of the space. I reflected in my journal about the intervention that A had begun:

> *I am so excited for participant A's agency towards implementing the research and developing the space. We came to find out that the building maintenance man had a masters in theatre lighting and understood the participants wanted less overhead lighting. He informed us during the installation that the solution was less LED tube lights and he created a lighting vector in each room by putting 1 LED tube per lightbox. He explained the process and how it would create the lighting affect they were looking for. Participant A loved the new lighting and informed me that they can now turn on the overhead lighting which they had left off before because of the overhead glare. Participant A shared experiencing resistance from participant B's unwillingness to collaborate on designing a communal space "It's still her space, her ideas, I just help move the furniture, and pay rent." Trying to be positive, A states that it is still the beginning and that B was trying, and that is all that mattered. Participant B did not engage with this intervention and didn't see the difference and stated that her "clients don't like it". I was beginning to see a tension building between the primary participants observing less interaction between iterations of design interventions.*

Participant B exhibited that her perception of space was shifting by her strong emotional response to each iteration. She cycled through opposition, frustration, and excitement after an adjustment period between each design intervention. Participant B exhibited an internal struggle with flattening behavior by exerting authority over the space, and with each iteration, her perception was challenged by a new awareness of herself within the space and analyzed how others interacted within the space. B's attention of how the other participants responded to the break space and awareness of the light intervention aligned

with a shift into a phenomenological attitude (Husserl, 1913/2014; Sokolowski, 2000).

I learned that perception is personal to everyone. The challenge of an individual's perspective can change their perception. The participants developed a new awareness of themselves in the space during each HCD intervention. Changing the space altered the perceptions of themselves and how they fit in that space both professionally and personally.

## Unflattening

During the research, I observed of how the process of unflattening manifested itself, both from my own observations and the experiences of the participants. The iterations of HCD interventions using the EPC methods of (3) design, (4) build, (5) test, and (6) deploy in the workplace forced the participants to interact with the space. Contradicting their perceptions of space, they had to develop an awareness of one another, their own aesthetic, and how to compromise. The documented responses show how unflattening is an idiosyncratic process that cycled through emotional highs and lows that was different for every single person.

Originally, the HCD interventions in the space were met with opposition and rigidity by participant B. The repeated response resulted in participant A seeking a third-party professional council on how to move forward professionally with participant B, and shared that, "Collaboration and communication is a part of sharing a space and developing a business together. I want to make sure this is what she still wants." Participant A scheduled a meeting with B to discuss her

views on the research and future partnership plans through using conflict

resolution strategies.

The process of unflattening started from the HCD layout intervention and

challenging participants perception of space. The primary participants needed to

reflect on their current emotional states to move forward professionally and

personally within the space together. Participant A shared with B that she was in

a state of productivity, ready to collaborate to make physical changes to create a

unified work environment. Participant B shared how difficult the research process

had been for her, she was experiencing unexpected emotional responses from

altering the space and collaborating with people was a new experience for her.

Participant B expressed that she needed time to adjust between interventions,

but still wanted to move forward professionally with participant A. At the end of

the meeting participant B instructed A to tear down her business sign in the front

entrance as a symbol of starting over on the space together (see Figure 10).



*Figure 10.* Participant B's business sign in the front entrance is removed.

The result of the meeting reinvigorated the pace of HCD interventions and communication between the primary participants was fueled with emotional excitement. Participant B began removing personal objects from communal areas every day to contribute and create a neutral work environment. The primary participants began to collaborate and show self-agency by productively planning together on how to make positive changes to the space to increase their well-being in the workplace. The primary participants went on a tour of other body therapeutic clinics together; took notes on furniture, and layout. They reviewed the design resources I had sent them to compare what their mutual aesthetic preferences were, compromised on design and function, and considered new business development plans.

The primary participants decided together to purchase a set of waiting room chairs online for the front entrance that they both found functional and appropriate for their vocation. The chairs provided their clients with personal space while supporting better posture, fit within their layout, and were easy to clean. The tour day also resulted in the primary participants setting up a wellness business management software that established communication, scheduling, and provided a marketing network for all participants renting space in the business suite. The action connected all the participants together professionally, for the first time within the workplace.

The benefits from the productive day had the participants on an emotional high, they were excited for the chairs to arrive and to change the space together. Below is a journal entry I recorded after being informed of the chair's arrival:

*The chairs arrived while participant A and B were both in treatment rooms with clients. Participant A's friend came in to help with assembling the chairs and re-arranged the room as a surprise. Participant B came out looked at the waiting room and left the space for the night without saying a word. Later texted participant A that she "hates the way the front room looks."*

The emotional response of participant B's text message shows the unflattening process cycles through emotional highs and lows with waves of excitement, anticipation, and disappointment. Participant A reported feeling, "emotionally hi-jacked" from participant B's response, the text, "was negative without a solution", and left A confused. Participant A decided to give B some space for a few days, understanding that B was emotive to the space, and needed time to adjust.

Participant A showed signs of self-agency to address participant B's emotional response by using email as a new place to communicate their ideas and express emotions temporarily between HCD interventions. This method proved a productive way for the participants to communicate during the unflattening process that allowed them to take time to contemplate, respond logically, and rationally to find a solution. Through email, participant A was able to schedule a date to meet with B in the workplace and re-configure the layout of the front entrance together. I designed a new layout intervention for the front entrance and left it for the primary participants to test out after being informed of participants B reaction. The new layout I provided included the new chairs and aimed to solve the collective issue of clients not staying in the waiting room until their scheduled appointment time (see Figure 11). I suggested the primary participants take everything out of the waiting room and start over from scratch

together. I explained that the negative space would allow them to find their own

functional layout together.



*Figure 11.* Photos sent by participants after taking everything out of the front entrance.



*Figure 12.* The front entrance after the new layout intervention.

The unflattening process developed high tension between the primary

participants and me as researcher. The new collaboration and motivation of the

participants following my suggestion to create negative space excited me. The

awareness of absence can be used to stimulate creativity (Sokolowski, 2000). I

wanted to understand where the participants were at together professionally and

personally after the stressful intervention. I decided it was time for all involved to

gather informally over a dinner. I reflected on the dinner the next day in my

journal:

> *Once at dinner we were able to relax, have fun, and laugh together. The relaxed and informal atmosphere of the restaurant gave us a place where we were able to clearly communicate to each other about the cycling emotional struggles we were all facing in the study. Examined where we went wrong, connected on the difficult nature of this process, and how we can successfully collaborate on ways to improve our interactions and the research process moving forward. Participant B shared with me and A about her current emotional stressors and past trauma with the space, how they were connected to failed ventures that isolated her within the space, and her struggle with giving up control in a professional environment. She explained that when the new chairs were re-configured in the room without her, it had made her physically ill, which caused her to leave the space abruptly. She reflected that she felt left out of the process, decisions were being made without her, and that she was losing control of her environment. Her awareness of that reaction made her contemplate her perspective and changed her perception. Participant A's method of using email to connect, gave B the time she needed to adjust and created an excitement of designing the front entrance space together a few days later. Both primary participants informed me this process was drastically impacting their lives positively in and out of the workplace. The process was incredibly difficult for both but led towards a greater awareness of what they wanted in the workplace, and in their daily life to increase their well-being. After dinner, we walked to the office and continued our conversation sitting in the new chairs, in the new front entrance layout, talking about their new perceptions and awareness of the space, and how the layout was positively impacting their practice.*

The outcome of investing informal time with the participants over dinner

yielded similar results to Akkerman et al. (2011). We were able to find a new

balance in understanding the complexity of the research process. Socializing

informally, in a relaxed setting away from the workplace, allowed us to connect,

and collaborate on new approach. I noted in my journal experiencing an emotional high that lasted weeks after the dinner:

> *The informal dining experience salvaged and reinvigorated the research and eliminated the daily stressors from the design process. The tension was gone, we were all on the same page, had grown closer in the process, are ready to move forward with clarity, and be a team again.*

The data show that through the process of unflattening, participant B reacted emotionally to the research because she was experiencing emotional reactions to stressors and past traumas that she had at the onset of the HCD interventions. The removal of different objects and changing the space caused her to react emotionally, but once the intervention was completed, her perceptions shifted, and her personality shifted. Her professional and personal life changed because of the changing space.

The process of unflattening was difficult for participant A. She entered the research logically and rationally and wanted to build a unified space with participant B. When participant A was met with resistance from participant B, it caused A to react emotionally frustrated first and then logically. Participant A did not have a connection to the space or the objects within the space with an experience as a hurricane survivor. The HCD interventions in the space developed her spatial awareness and ignited productivity, creativity, collaboration, and self-agency in the space professionally and personally. She began investing meaning into her space, objects were handpicked by her to create a relaxing environment for her and her clientele, "which was huge for me" participant A revealed later.

I found that the participants reacted with their own personality traits, they brought their own professional and personal stressors to the unique and idiosyncratic process of unflattening. The difficult process of awakening is not sequential, it is iterative and cyclical, as Sousanis (2015) illustrated in his graphic novel, "Overcoming a linear static view requires such a shift in awareness. Attuning ourselves to different ways of seeing . . ." (p. 44). Unflattening is personal, and cycles through anticipation, excitement, and interpersonal frustration. Unflattening is the process by which we confront the flattened baggage we carry. The participants emotional response and new awareness within a space is a part of that process which resulted from challenging perception.

**Well-Being**

The process of unflattening developed a higher sense of well-being in and out of the workplace. The iterations of HCD interventions increased the participants' awareness of their space, and they began to exhibit a phenomenological attitude towards the changing of the space (see Appendix B for final layout). Data collected from journal reflections, photos, and observations show the impact that HCD had on the participants' perception. By manifesting the difficult process of unflattening, the participants had to work toward their own well-being both professionally and personally in and out of the workplace.

The day following our informal dinner, I dropped by the clinic for an appointment and to observe new HCD interventions that the primary participants

were conducting on their own. I reflected the experience in a journal entry, and it

is paired with the photo below (see Figure 13):

> *The day after the dinner, the primary participants created a new business name. The new name acts as an umbrella that visually unites the participants to clients online and in the workplace, while allowing the participants to operate their own individual businesses. I dropped by the office and walked into the waiting room where Participant A is showing participant C how to work the new wellness business management software and is teaching her how to use it to help grow her business through marketing. Participant A is ready to focus on her personal treatment room. Participant B is taking time to process her emotional response to the space while working on her treatment room and asking for participants and my input.*



*Figure 13.* Participants are collaborating and interacting in work environment*.*

Participant A and C reported that they liked the new layout and informed

me that it was the solution to keep clients in the waiting area until their scheduled

appointment time. The layout gave the participants the time they needed to flip

their treatment rooms between clients, without clients following them into the

treatment room while they prepped it. The new layout allowed all participants to

be behind the desk at the same time if there was information to communicate

and gave employees and clients their own space (see Figure 14). Participant A

enjoyed the process of emptying the front entrance room completely and wanted

to try this process in her treatment room.



*Figure 14.* New layout intervention gives clients and employees their own space.

Participant B did not connect with the new layout that she and A had

designed together, the same layout we had sat in after our informal dinner, said

she needed time to get used to it. A week after the implementation, participant B

reported to A and I on experiencing the benefits of the new layout, and how it

provided a solution to keeping clients in the waiting room until their scheduled

appointment time. She stated that there were a lot of changes happening and

informed us that she was still processing and focused on being open to the

process. The HCD layout intervention in the front entrance remained in place and

all participants report benefits of productivity, creativity, collaboration, and self-

agency both professionally and personally in and out of the workplace (see

Appendix B for final layout).

The impact of the HCD interventions altered participant A's awareness to space. When an HCD intervention occurred in common areas, she tried something new in her treatment room (see Figure 15). The layout intervention of exploring negative space induced the most noticeable change in participants A's perception. Participant A sent photos of how she created a, "blank slate" in her room, paired with a text message shared, "I can't visualize the change if everything is up on my walls . . . taking it all down, I didn't realize how much noise everything was causing in my mind" (see Figure 16).



*Figure 15.* Participant A's treatment room after the first layout intervention in the front entrance, addition of a plant, and removed her desk to contribute it to the break space*.*

*Figure 16.* Participant A's treatment room with new furniture, blank walls, and curtains after the newest layout intervention with the new front entrance chairs.

The self-agency that participant A exhibited in her own space inspired participant B to try out some new interventions in her space (see Figure 17-19).



*Figure 17.* Participant B's treatment room before the research began.

*Figure 18.* Participant B's treatment room after the first layout intervention and room re-configuration.



*Figure 19.* Participant B's treatment room evolving from participant A's treatment room changing.

Perception shifted for participants as their awareness continued to grow from each HCD intervention in the workplace. I experienced in myself and the participants what Sousanis (2015) described as, "disrupting these deeply ingrained patterns takes a profound nudge . . ." (p. 25). When the research ended, the participants shared with me, in-person, the deep transformational change that the research had on altering their perceptions, professional and

personal lives, and their awareness of how attention to space brought them feelings of well-being. The final EPC step of (6) deploy was observed when the primary participants continued to conduct HCD interventions in the workplace after the research ended and kept in contact, sharing their excitement through pictures and new ideas. The data below was collected after the research ended and provided evidence that supports the assumption that changing space through HCD alters perception and increases well-being in and out of the workplace.



*Figure 20.* The HCD intervention in same layout with new objects.

The primary participants collaborated on the design of the shared spaces to create a neutral and welcoming environment for clients and employees. The awareness of layout and objects in the front entrance, created accessible retail, beverage, and waiting room space that clients did not wander from (See Figure 20, 21, 22). Each participant has their own drawer labeled with their name at the front desk, so they can interact and feel connected to the space professionally.

*Figure 21.* Balanced hallway, figure on the left is at the end of the study, figure on the right shows a new mirror and wall art added weeks after study ended.



*Figure 22.* Accessible front entrance seating and retail. Aesthetic collaboration.

The break space appeared to separate the participants personal life from their treatment rooms and enhanced their professional and personal well-being. The break space had two desks, a larger fridge, kitchen space, storage for personal items, and retail inventory (see Figure 23). The participants informed me that they really enjoyed the space and were planning on incorporating

shelving and additional features soon. The new communal kitchen sink access, which had only been accessible to participant B prior, served as a place for all participants to wash their tools between clients instead of exiting the business suite to the shared building bathroom, saving them time and energy.
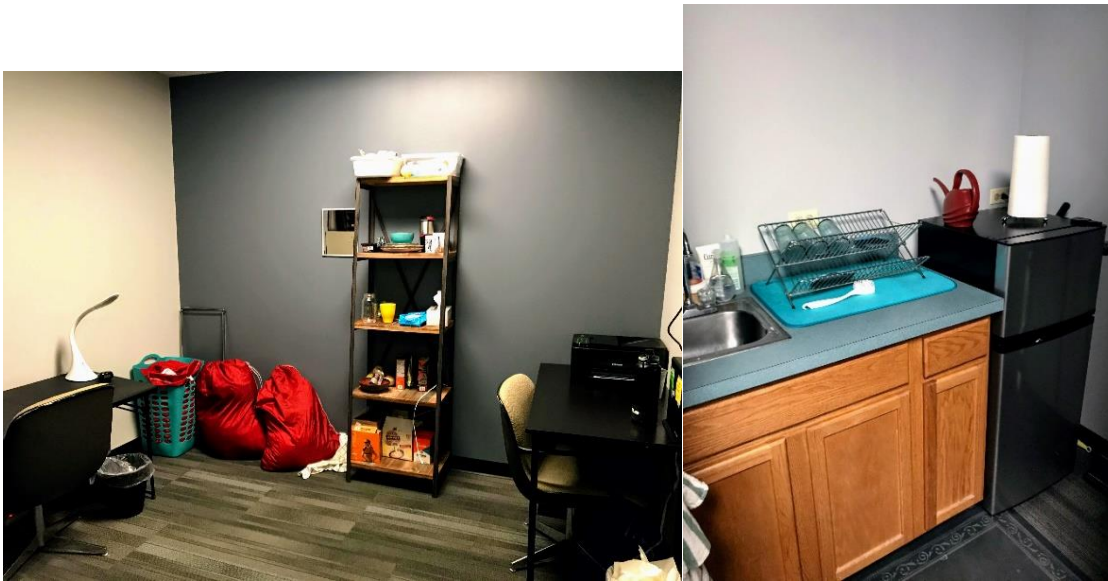


*Figure 23.* Functional break space development.

Participant A reported feeling that over the research process she had developed, "a creative voice and opinion, a design style I never knew I had." She stated that she was happier coming into the workplace, felt increased well-being working in her treatment room, and felt a greater sense of belonging in the workplace. She exhibited pride and confidence reflecting on the changed treatment room, acknowledgement of the research facilitated through my design resources and advice, were signs of self-agency and development of creativity (see Figure 24). Participant A also believed she developed a professional voice, felt confident in collaborating and sharing a space with others. Participant A reported that she has been hearing participant B laugh for the first time. The

laughter had been so loud, and frequent she had to get a brown noise machine to mask it. She is not upset about it either.



*Figure 24.* Participant A's treatment room three months after the study ended.

Participant B shared with me the impact HCD benefits have had on her out of the workplace and that she went through a significant change in her perception through the unflattening process that manifested from the HCD interventions. The process had been difficult for her, but she was happy that she went through it. Participant B informed me that she restarted her self-care routine of exercising, socializing, and attending to mental well-being after flattening had reduced her routine practices. She showed me her vision board (see Figure 25) that she created and explained, it was a daily reminder of her journey and encourages continued work towards well-being. A smile on her face, she said that, "changing the space made me see new personal and professional areas for growth to improve my practice; I am ready to move on and try something new, and this experience has provided me with a new outlook on life." Participant B

informed me that she had been using the HCD techniques in her house and personal life to get down to a "clean slate."



*Figure 25.* Participant B's Vision board she created after the study ended.



*Figure 26.* Participants communicating in the hallway weeks after study ended.

The iterations of HCD interventions in the space contributed to the unflattening process, culminated a higher sense of well-being in and out of the workplace. The data collected over the course of the study show HCD benefits

were observed in the form of productivity, creativity, collaboration, self-agency, and well-being in the participants in and out of the workplace. When we changed the space, it shifted the perceptions of the participants' themselves both professionally and personally in a positive way in and out of the workplace.

## Conclusions

The data gathered during this study aligned to the identified themes of flattening, perception, unflattening, and well-being and was supported through previous research of HCD in the workplace by Clements-Croome (2018), Krahnke and Gudmundson (2018), Timm et al. (2018), and Wilson et al. (2016). The participants' emotional response to the shift in their perception of space and the meaning of objects aligned with the phenomenological research of Husserl (1913/2014), Sokolowski (2000), Weschler (2008), and Eliasson and Ursprung, (2012). The implementation of the DBR method in the HCD interventions revealed results that were similar to the Akkerman et al. (2011) study that discussed the complexities of the DBR method. I experienced opposition from the participants and had trouble establishing credibility. The complexity of DBR impacted the timeline and sequencing of the research. The method is deep, authentic, and different in each scenario. The previous research on HCD interventions in the workplace mainly focused on the positive benefits of the interventions and only briefly touched on people's reactions and resistance to the interventions or not at all.

I conducted the study in an established business and not in a new building. Primary participants both seemed excited to begin the design process

but soon realized they had contradicting perceptions of space and aesthetic beliefs. The human factor in conducting research at an established business practice is where I found HCD interventions revealed the difficult process of unflattening in the workplace. Unflattening is an interpersonal and gradual human process that can slow the rate of HCD implementations in the workplace and cause friction between participants.

CHAPTER V

CONCLUSIONS

The implementation of human-centered design (HCD) related to increased productivity, creativity, collaboration, self-agency, and well-being both professionally and personally, in and out of the workplace. Unflattening is the process by which participants arrived at these results.

Altering the space through HCD interventions corresponded with the participants' perception of themselves within the space both professionally and personally, which began the process of unflattening. There was previously no data supporting an understanding of how participants were going to react to HCD interventions; individuals brought their own idiosyncrasies to the process. In addition, design-based research (DBR) methodology may be applied to any research, the organic nature of the method does not determine a specific result, it is transformational, and the process will be exclusive to each individual because everyone is unique.

**Further Recommendations**

The final DBR motive is to *establish sustaining changes in the field*. It is crucial to note that implementing HCD into a small, local, and established workplace is difficult to categorize into steps. Because the participants were independent business owners, interventions were implemented after they had exerted a full day of physical work. Interventions and iterations were adjusted to

fit within the unpredictability of daily life. Because the interventions began a process of unflattening, which is idiosyncratic by nature, it becomes very important to understand the participants' personality before engaging in the process so that you are prepared to cope with interpersonal challenges. People react with their own personality traits and stressors to HCD interventions in the workplace. This knowledge can be used to improve this practice, by engaging and taking the time to get to know the participants before implementing HCD. Have the participants identify problems of flattening in the workplace and then address their different perceptions on how to solve that problem. Becoming familiar with participants' personality traits ahead of time by challenging their perceptions of space, gives them time to prepare for the difficult task of planning and creating a meaningful environment using a phenomenological framework.

The human factor should be at the center of the business design. For future research it is important to consider reducing participants' emotional response during HCD interventions, by addressing planning time needed before implementing. Bowden (2018) suggests that participants involved in the design process should discuss any possible preferences or inclinations towards design options. It is influential to question if individuals are bringing their previous life experience, their baggage, into how they perceive and design an environment. Does personal flatness need to be addressed before the physical implementations start? How can attention to aesthetic and function of an environment benefit the human experience across disciplines?

This study shows that HCD techniques can be applied in any business model, budget, and over any time frame. When compared to larger corporations like Google and Facebook that have the economic capitol to hire a team to undertake the design process, HCD can be stressful, intense, slow, and look different with a small independent business. In smaller settings, the members of an organization take on the HCD stressors of confronting flatness in the work environment. Their perception is challenged to develop a new awareness. This begins the difficult and interpersonal process of unflattening, that when iterated can provide solutions to problems in the workplace. The intentionality of increasing human well-being in and out of the workplace through HCD techniques is essential to create a healthy individual and an innovative organization.

REFERENCES

Akkerman, S., Bronkhorst, L., & Zitter, I. (2011). The complexity of educational design research. *Quality & Quantity, 47*(1), 421-439. doi:10.1007/s11135-011-9527-9

Bowden, S. (2018). Optimising well-being and productivity through an ergonomics-based approach. In D. Clements-Croome (Ed.), *Creating the productive workplace* (pp. 160-172). New York, NY: Routledge.

Brigham, A. (2017). [Traveling Still]. Unpublished raw data.

Clements-Croome, D. (2018). *Creating the productive workplace* (Third ed.). New York, NY: Routledge.

Creswell, J. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (Third ed.) Sage Publications, Inc.

Eliasson, O., & Ursprung, P. (2012). *Studio Olafur Eliasson* (Multilingual ed.) Taschen.

Fortune. (2016, March 29). The 18 coolest offices of the 100 best companies to work for. Retrieved from https://fortune.com/2016/03/29/coolest-offices-of-the-100-best-companies/

Hanks, G. (2018). Knowledge workers. *Immigration and Migration, 1*(In Context), 495. Retrieved from https://link-galegroup-com.unco.idm.oclc.org/apps/doc/CX3662200100/GVRL?sid=lms

Husserl, E. (2014). *Ideas I* (D. Dahlstrom Trans.). Cambridge, Indianapolis: Hackett Publishing Company, Inc. (Original work published 1913)

Krahnke, K., & Gudmundson, D. (2018). Learning from aesthetics. In P. Leavy (Ed.), *Handbook of arts-based research* (pp. 559-571). New York, NY: The Guilford Press.

Lapum, J. (2018). Installation art. In P. Leavy (Ed.), *Handbook of arts-based research* (pp. 377-395). New York, NY: The Guilford Press.

Marlow, P. (2003). *The weather project* [Photograph]. G.B., London, England: Tate. Retrieved from https://library-artstor-org.unco.idm.oclc.org/asset/AMAGNUMIG_10311505742

Mental Health America. (2019). Depression in the workplace. Retrieved from http://www.mentalhealthamerica.net/conditions/depression-workplace

Smiraglia, C. (2014). Artworks at work: the impacts of workplace art. *Journal of Workplace Learning, 26*(5), 284-295. doi:10.1108/jwl-11-2013-0097

Sokolowski, R. (2000). *Introduction to phenomenology*. New York, New York: Cambridge University Press.

Sousanis, N. (2015). *Unflattening*. Cambridge, Massachusetts: Harvard University Press.

The Design-Based Research Collective. (2003). Design-based research: An

emerging paradigm for educational inquiry. *Educational Researcher, 32*(1),

5-8. doi:10.3102/0013189X032001005

Timm, S., Gray, W. A., Curtis, T., & Chung, S. S. E. (2018). Designing for health:

How the physical environment plays a role in workplace wellness. *American

Journal of Health Promotion, 32*(6), 1468-1473.

doi:10.1177/0890117118779463b

Visual Paradigm. (2019). Empirical process control vs defined process control.

Retrieved from https://www.visual-paradigm.com/scrum/empirical-vs-defined-

process-control/

Welch, C. (2018, February 1). See the offices where employees can work in a

tree house. Retrieved from

https://www.nationalgeographic.com/environment/urban-expeditions/green-

buildings/amazon-glass-forest-office-seattle/

Weschler, L. (2008). *Seeing is forgetting the name of the thing one sees*

(expanded ed.). Berkley: The Getty Foundation.

Wilson, C., Bungay, H., Munn-Giddings, C., & Boyce, M. (2016). Healthcare

professionals' perceptions of the value and impact of the arts in healthcare

settings: A critical review of the literature. *International Journal of Nursing

Studies, 56*, 90-101. doi:10.1016/j.ijnurstu.2015.11.003

**APPENDIX A**

**INSTITUTIONAL REVIEW BOARD APPROVAL**

UNIVERSITY OF
**NORTHERN COLORADO**

*Institutional Review Board*

DATE: May 3, 2019

TO: Alexandra Brigham
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1399006-1] How Integrating Human-Centered Design Affects the Workplace
SUBMISSION TYPE: New Project

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE: May 3, 2019
EXPIRATION DATE: May 3, 2023

Thank you for your submission of New Project materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

**Hi Alexandra,**

**Thank you for a very thorough application! Just a couple things of note prior to you beginning your research project.**

**1. Please add your advisor's contact information to the top of the informed consent.**

**2. Please ensure that participants have completed the informed consent before they begin the survey.**

**Best of luck with your research!**

**Nicole Morse**

**Research Compliance Manager**

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or nicole.morse@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

**APPENDIX B**

**CASE STUDY BUILDING LAYOUT**

Initial Layout
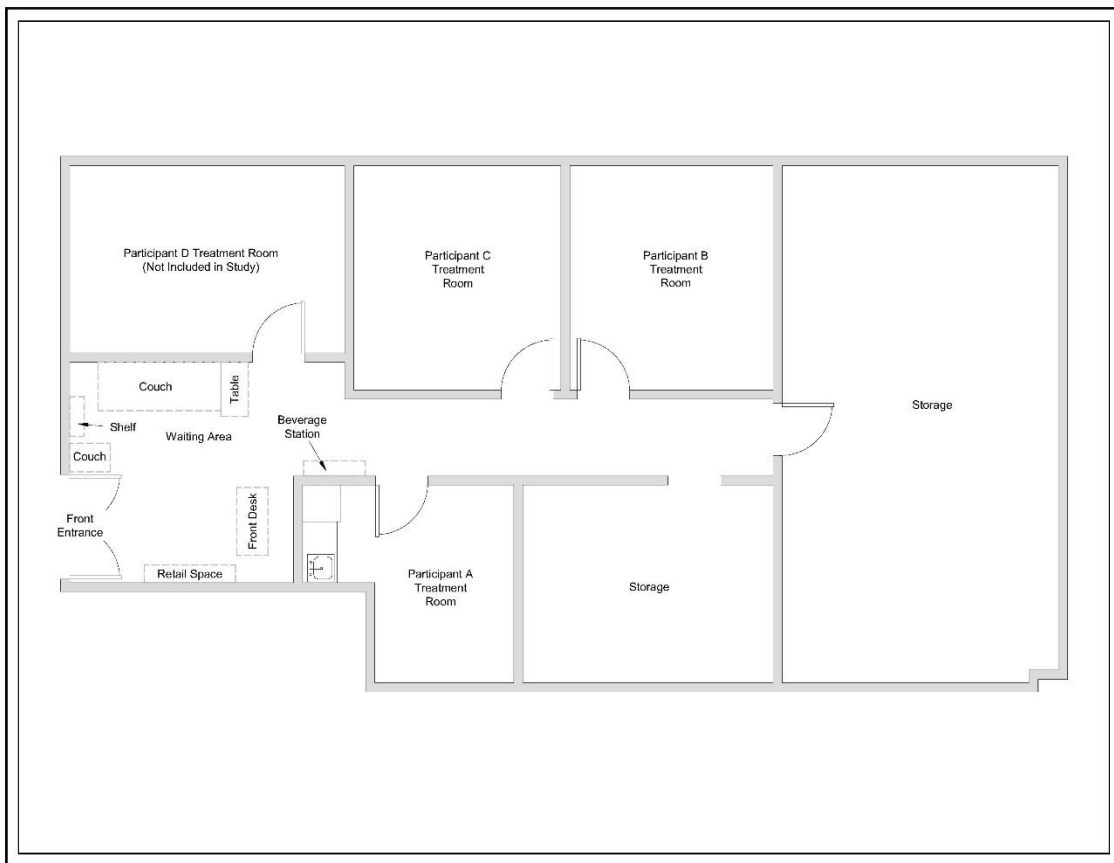
Final Layout

**APPENDIX C**

**JOURNAL TRANSCRIPTS**

Journal Entry, 9/9/2019

Reflections and Observations of Research Site, HCD Interventions, and

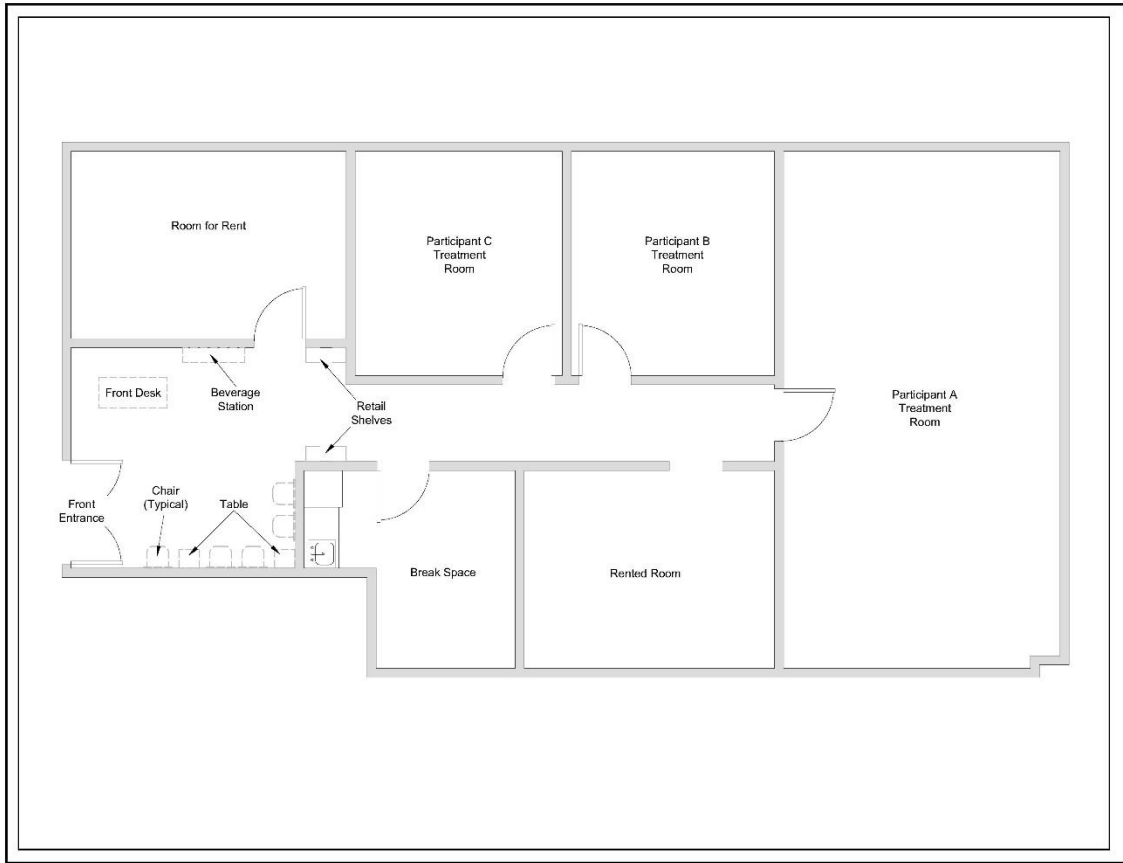Participant Responses.

The first initial meeting with participants at the research site was

scheduled four days after accepting my research proposal. I didn't have the time

to prepare as I had with the previous research location. The participants seemed

excited to be involved with the research. I brought in a portfolio of HCD options

visually represented through colored sketches. We discussed their current needs

in the workplace environment. I have chosen to write my observations from the

meeting, the initial walk through, and discussions of the space as journal entries.

The front entrance was cluttered with objects that had no meaning to me. I was

unable to interact with the front entrance which also included a waiting and retail

area. The layout had me standing in the middle of the front entrance until my

scheduled appointment. I thought the couch was inaccessible for all clients given

their physical limitations and that some may not want to sit on a couch next to a

stranger. There was no common area for staff or a break space, there were two

rooms not being rented and used for equipment storage. I proposed the

participants discuss designating a break space, so that the participants all had a

space to go to in-between clients.

I interpreted that participant B had the final say on design decisions in the

space because of her ownership of the lease. I understood that all the objects in

the front entrance and in the hallways were participant B's. Most of the objects in

the space are personal rather than professional and only applied to participant B.

Participant A and C had only business cards in the front entrance. I observed

participant B as being emotionally responsive to the creativity of the front

entrance. I perceived this as excitement connected to her space and her objects.

Participant B was willing to compromise on designating a break space but didn't

seem as excited as the other participants did. I observed B's excitement plateau

as evidence of flattening; she is giving up her authority on the space. Participants

A and C showed a passive response to the front entrance. I perceived that the

passive behavior of A and C in the waiting room was due to not having creative

input or objects in the common areas. Participant A and C exhibited a positive

emotional response to the break space, I concluded their positive response to the

break space stemmed from the process of creating a new space as a team.

Journal Entry 9/27/2019

Reflections and Observations of Research Site, HCD Interventions, and Participant Responses.

I scheduled a meeting with participant B two days after participant A began the warm LED tube lighting installment. The meeting was a strategy to get to know participant B better, I am familiar with participant A because I am her client. The first layout intervention had occurred a week before that reconfigured the front entrance, participant B's treatment room moved to the large room in the back of the business suite, and break-space was introduced where participant B's treatment room once were.

I started to challenge the perception of her space by asking her questions about specific objects' purpose in the space and layout choices she made since the first reconfiguration. I began to observe resistance in my line of questioning from participant B. She was not interested in discussing the questions, DBR interventions, or other ideas that I presented to her, the reason being "I hate it, this is the way I have always liked it." Her body language and tone of voice became defensive. She explained that she was having a problem trusting me and participant A to follow through on the design process and wanted to take responsibility for designing her space with my guidance. The interaction was one sided and no solutions were provided that aligned with my research. I felt I was losing authority of my research and B was going to "take it from here." I felt that participant B was going to stall the research process.

I reached out to participant A regarding B's defensive behavior to try and understand what was happening, when compared to the excitement of their first layout intervention together. Participant A expressed increased friction that was occurring between them since the first layout intervention. Participant A decided to become the liaison between me and participant B. The reasoning that she knows participant B better than I do and believes that reducing the interaction to one person for new interventions might make it easier on B.

Journal Entry, 9/27/2019

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

Both primary participants informed me that participant C was generally shy

and was beginning to show signs of socializing at work, looked happier and

reported that she said "I am so happy about the break space, I feel much more

comfortable during my work day knowing there is a private relaxing space away

from my treatment room and the  front entrance."

Journal Entry, 9/25/2019

Reflections and Observations of Research Site, HCD Interventions, and Participant Responses.

I am so excited for participant A's agency towards implementing the research and developing the space. We came to find out that the building maintenance man had a masters in theatre lighting and understood the participants wanted less overhead lighting. He informed us during the installation that the solution was less LED tube lights and he created a lighting vector in each room by putting 1 LED tube per lightbox. Explaining the process and how it would create the lighting affect they were looking for. Participant A loved the new lighting and informed me that they can now turn on the overhead lighting which they left off before because of the overhead glare. Participant A shared experiencing resistance from participant B's unwillingness to collaborate on designing a communal space "It's still her space, her ideas, I just help move the furniture, and pay rent." Trying to be positive, A states that it is still the beginning and that B was trying, and that is all that mattered. Participant B did not engage with this intervention and didn't see the difference and that her "clients don't like it." I was beginning to see a tension building between the primary participants observing less interaction between iterations of design interventions.

Participant B was willing to connect me with people regarding the building's property management company, she seemed positive about those interactions. Her mood was indifferent if the design option wasn't her idea or something that she was comfortable with and used to.

Journal Entry, 10/1/2019

Reflections and Observations of Research Site, HCD Interventions, and Participant Responses.

The increasing tension of participant B's emotional responses to the interventions caused Participant A to seek out professional council in order to learn coping and conflict resolution strategies to move forward with participant B. "Collaboration and communication is a part of sharing a space and developing a business together. I want to make sure this is what she still wants." Participant A scheduled a meeting with B to discuss her views on the research and future partnership plans through using conflict resolution strategies.

Participant A called me after the meeting, almost sounded like she was hyperventilating. She was excited and informed me that the conversation was difficult and needed to be done, as they had not had an intense discussion about where they wanted to go professionally together. Participant B instructed A after the meeting to rip down her business sign in the front entrance. This was a sign of good faith and wanting to contribute to creating a neutral front entrance. Participant A sent me a photo of the sign being torn down and was so excited for what was going to happen next. Participant B wanted to move forward and opened to A about deep personal emotions and stressors she was going through that were exacerbated by the research process. Participant B expressed wanting to move forward with A professionally and that she needed time to adjust between interventions.

The participants decided that they needed to take a day off and go on tours of body therapy clinics and discuss their design preferences together. They also decided after the tour to sit down to hash out a framework of how they would like to start integrating their practices in the office and clients online, they want to grow together. They started by unifying their practices online and teaching other participants how to use a new business management and scheduling software. Primary participants purchased a set of waiting room chairs to replace the couch that participant B had brought from her home.

Journal Entry, 10/16/2019

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

The primary participants seemed to be getting along with and starting their

own interventions after their big meeting two weeks before. They were on an

emotional high after getting on the same page.

The chairs arrive while participant A and B are both in treatment rooms

with clients. Participant A's friend comes in to help with assembling the chairs

and re-arranges the room as a surprise. Participant B comes out looks at the

waiting room and leaves the space for the night without saying a word. Later

texting participant A that she "Hates the way the front room looks."

Participant A called and texted me later that evening, telling me that she

felt emotionally high-jacked by B. Participant B left the space immediately after

seeing the new arrangement, and chose to text later without providing a solution

to the problem. Participant A was frustrated and confused by B's response, "We

picked the chairs out together why does she hate them?" Participant A decided to

give B the space and time she said she needed to adjust to the change in space.

Participant A decided that email communication between her a B would be a

better way for them to communicate during the HCD interventions.

I designed a sketch for a new layout for the primary participants to try out

when B was ready. The layout was set to address the problem of clients

wandering around the office instead of staying in the waiting area until their

scheduled time (I sketched the layout by hand and my prompts are made by

hand-for future studies it may benefit participants to create technical diagrams so participants don't get confused, they are not artists and trying to decipher someone else's handwriting and sketches might be stressful). I sent them information about how negative space can have an impact on stimulating creativity in space, and suggested they try the same when creating a new front entrance together.

It is time for me and the primary participants to get together and on the same page as well, probably over a casual dinner. So much has happened physically in the space and emotionally between the participants, it has been several weeks since I interacted with participant B in person. I was excited and nervous when all our schedules lined up for a Friday dinner date.

Journal Entry, 10/21/2019

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

Primary participants communicated over email after the chair intervention.

Participant A waited a few days after B's response to the chairs and presented

the idea that they should re-arrange the space together without anyone else.

Participant A used the diagram I sketched as a guideline. She introduced the

information I sent her on negative space to participant B, and insisted they try

taking everything out in the front entrance to start a new layout intervention with a

blank slate. Primary participants had another large talk before they did the new

layout, participant A wanted to understand B's reaction to the change in space

and express her confusion, because they picked out the chairs together.

Participant B agreed and thanked A for her patience and understanding and

expressed the feeling of losing control of the space made her sick. Both primary

participants sent me photos of the process, specifically the correspondence from

participant B was important. We had not been in contact for a few weeks. This

new iteration was taking place four days before our scheduled dinner, they will be

able to give me feedback on the new layout when we get together. I was so

excited how far the primary participants had come together and were still pushing

to understand one another, their experiences, and perceptions.

Journal Entry, 10/25/2019

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

Once at dinner we were able to relax, have fun, and laugh together. The

relaxed and informal atmosphere of the restaurant gave us a place where we

were able to clearly communicate to each other about the cycling emotional

struggles we were all facing in the study alone and with each other. Discussing

where we went wrong, we connected on the difficult nature of this process, and

how we can successfully collaborate on ways to improve our interactions and the

research process moving forward. Participant B shared with me and A about her

current emotional stressors and past trauma with the space, how they were

connected to failed ventures that isolated her within the space, and her struggle

with giving up control in a professional environment. She explained that when the

new chairs were re-configured in the room without her, it made her physically ill,

which caused her to leave the space abruptly. She reflected that she felt left out

of the process, decisions were being made without her, and that she was losing

control of her environment. Her awareness of that reaction made her

contemplate her perspective and changed her perception. Participant A's method

of using email to connect gave B the time she needed to adjust and created an

excitement of designing the front entrance space together a few days later. Both

primary participants informed me this process was drastically impacting their

lives positively in and out of the workplace. The process was incredibly difficult

for both but led towards a greater awareness of what they wanted in the

workplace, and in their daily life to increase their well-being. After the dinner, we walked to the office and continued our conversation sitting in the new chairs, in the new front entrance layout. We talked about their new perceptions and awareness of the space, and how the layout was positively impacting their practice.

I feel that this huge weight has been lifted off my shoulders and mind, I have been stressed during the interventions, feeling the tension in the space and between the participants, and myself. I believe informal time to discuss the research process with primary participants is imperative and should have been done sooner.

Journal Entry, 10/26/2019

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

The informal dining experience salvaged and reinvigorated the research

and eliminated the daily stressors from the design process. The tension was

gone, we were all on the same page, had grown closer in the process, are ready

to move forward with clarity, and be a team again.

It is important to note the intensity in this research method. The

participants are both bringing their emotional stressors and previous experiences

into the research which fuels their perception of space and their interactions with

one another regarding the change in space.

Journal Entry, 10/26/2019

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

The day after the dinner, the primary participants created a new business name. The new name acts as an umbrella that visually unites the participants to clients online and in the workplace, while allowing the participants to operate their own individual businesses. I dropped by the office and walked into the waiting room where Participant A is showing participant C how to work the new wellness business management software and is teaching her how to use it to help grow her business through marketing. Participant A is ready to focus on her personal treatment room. Participant B is taking time to process her emotional response to the space while working on her treatment room and asking for participants and my input.

Participant A and C inform me that they really like the new layout. They had experienced that it had quickly solved the wandering client's issue. By giving clients their own space with individual chairs and placing the waiting area on the other side of the hall, the participants found they had the time to flip their treatment rooms without having to interact with wandering clients.

It is important to remember that before the study, the participants did not have frequent interaction or contact professionally or personally in the office, some did not have one another's contact information or know their practice focus.

Journal Entry, 10/28/2019

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

Participant A over the course of the study made a habit of intervening on

her treatment room whenever a new HCD intervention or iteration happened.

She tried out participant B's layout to understand why she liked having her

treatment table diagonal in her room. The biggest change for participant A came

after the informal dinner and the test on negative space in the front entrance

layout. She wanted to know what that looked like for her treatment room.

Participant A and I had been shopping together for her room and going

back and forth with design ideas. She had purchased curtains to filter light, new

floor lighting, and we had found a large cabinet to store all her equipment. I had

also upcycled some metal wall décor we found together while thrifting.

She messaged me after she was done working, explaining that she took

everything off the walls in the treatment room that didn't need to be there design

wise, "I need to start with a blank slate." She couldn't believe how different the

space looked and how different her mind felt after she removed everything. "I

can't visualize the change if everything is up on my walls. . .taking it all down, I

didn't realize how much noise everything was causing in my mind; I feel more

peaceful."

Participant A wanted to show participant B what she was doing in her

room, not to pressure but to inspire B, and show her another perspective on

space. Showing how she was experimenting with space, knowing that she can

change it back if she doesn't like it. This self-agency from participant A

encouraged B to experiment with her treatment room as well. Participant B

removed everything off her walls and purchased the same curtains that I supplied

to participant A for the windows. Participant B commissioned me to dye some

curtains to cover her mirror in the treatment room. She also created a long

cabinet with her current furniture to mimic participant A's equipment storage.

Primary participants reached out to me and informed me that their new

focus was on creating a business together logistically, and that major art and

decoration will happen slower over time, to work for them financially. They had

both invested several hundred dollars into the HCD interventions that they chose

to do together and were going to make the rest of what they had work. It was

great to hear they were talking about their priorities together, deciding what was

important to them, and were discussing what they wanted from me in their next

iterations and development.

Journal Entry, 1/22/2020

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

I went into the clinic for an appointment with participant A and to pick up

some tools and art I had left there for them to use. They have really settled into

this new layout and collaborated on a universal style they could both agree on.

The metal bursts that I upcycled were spaced evenly apart on the wall in the front

entrance. I love the way it felt when I walked in there. I sat in the front entrance

and looked around in shock, how much this space had changed since when we

first started working together in September of 2019. The retail area was flanking

both sides of the hallway at eye level, forcing clients to look at it when they

walked by to their appointments. The space looked cleaner, organized like a

business. I was comfortable sitting the waiting area, the chairs were comfortable,

the space was welcoming.

This visit was preceding text correspondence with participant A over the

holidays, saying she couldn't send pictures to what they had done in the space,

and that I had to come and see it for myself. Participant A came around the

corner and said, "I know, that's why you needed to see it person, the front

entrance is professional, I love coming to work now; now you need to my

treatment room!" I walked down the hallway it was clean with no haphazardly

hung licenses or documents on the walls. I entered the treatment room and was

again shocked-participant A had completely invested time, money, and energy

into creating her own space with her own style. She had used the resources and

HCD advice I had provided to find her own creative voice, it was beautiful. Fabric draping from the ceiling, floor lighting creating a wonderful ambience, and simple nature inspired décor that went with her business logo. She even had purchased accent fabric for the ceiling and wanted to show it to me before she hung it up using the magnets I purchased and painted for ceiling installations.

Journal Entry, 2/6/2020

Reflections and Observations of Research Site, HCD Interventions, and

Participant Responses.

I love that I get to keep seeing the research location change after the

study is over. Again, Participant A had something she wanted to show me in

person and didn't want to send a photo. She had installed a contrasting blue and

turquoise fabric strip the width of her treatment table on the ceiling above it. Wall

tree decals I had introduced her to earlier in the study that she had been wanting

to try out for months to further explore her nature theme in different media. She

added new lighting and new ergonomic furniture to benefit her practice. The

space was gorgeous, calming, and you could see she was happy with it and

herself.

Participant A showed me the break space. They now had two desks in the

room because participant C worked in the break space with some frequency.

There is new shelving where they put snacks, beverages, and other self-care

items. Participant A purchased a larger refrigerator for the break space so they

could bring food from home instead of going out to eat around the research site.

There was also a dedicated place to put their bikes, coats, and bags with hooks

and shelving. The new break space allowed everyone that rented a room to have

access to a sink, refrigerator, storage, and place away from their "office."

During my appointment with participant A she informed me that since her

and participant B's big talks, collaboration, and the dinner that B is laughing

frequently and loudly. Participant A said she has never heard B laugh this much

or at all until the case study. "I had to get a brown noise machine to cover up the laughter from carrying into my treatment room, how do you tell someone that is happy that they are laughing too loud?" Participant A expressed to me how much the research had impacted the way she looks at space and how it makes her feel. "I have a creative voice that I never knew I had; the design was influenced from your guidance, through it I found myself and my style in the design process; I discovered parts of myself that I didn't know were there; I didn't realize how deep my disconnection of objects and space, from losing everything I owned in hurricane Katrina and past traumas, was impacting my personal and professional growth."

After my appointment I met with participant B and booked a physical therapy treatment with her so we could also catch up and see how she is doing after the research had ended. I observed that participant B had a big smile on her face, a new haircut, and was walking with more confidence and ease in the space. It seemed that she existed in the space before and was not a part of it.

Journal Entry, 2/10/2020

Reflections and Observations of Research Site, HCD Interventions, and Participant Responses.

When I arrived for my appointment, I was excited to see participant B and her treatment space. She was still downsizing, simplifying her space, storage of equipment and items in transition were hidden behind a false wall she created with a curtain. Participant D who I had removed from the written research because I never met her, and she never came into the space, and was also from Participant B's previous failed business venture. Participant B had reached out to her and informed her she was ready to rent her room and to move on from their previous arrangement. Participant B had moved D's office into her large treatment room in the back and separated the room with a mobile wall. Participant D's room was furnished as a new rental. They were friends, and D was still renting a room until the lease was up, using it once a month while she practiced fulltime elsewhere. Participant B expressed that having D's furniture in the space was a reminder of the past, and she was ready to move forward. I asked her if she was happy in the back room and she said, "I use all of my equipment now that it is all in one room than spread out, it makes me more efficient to help my clients."

Participant B confided that she was getting ready to give up on the space until I intervened with the research proposal. The research has given her a new and deeper understanding of what she wants. She thought that she had been doing the personal work for her well-being. The research, questions, and

challenging of perception made her realize that she has areas of her life that she needed to address to get to where she wants to be professionally and personally to be happy. She has a new outlook on life and knows she has a long way to go in healing from her emotional stressors and past traumas.

I noticed that the shelves in the corner of her space weren't covered in binders or objects anymore. They were filled with vision boards, her new book, and lights from her solo trip to Mexico she just got back from. I asked her I could look at her vision boards, photograph them, and if she wanted to explain to me what they meant for her. Participant B agreed, she explained how each board symbolized a different part of her life that she wanted to work on. The vison boards were placed so she could see them while she was working and be reminded every day where she wanted to be and how she could get there.

When my session ended, she gifted me the book that she had published during the study with a note written on the inside leaf that said, "Alex-Thanks for your support and challenge."