Introducing play in design higher education: A South African case study

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[1] To access Appendix B, please click on the link to access the Google Drive folder.

DECLARATION OF AUTHENTICITY

I, Marguerite van der Merwe (student number: 28006543), declare that this thesis is my own, original work. Despite financial support received, all findings, interpretations and opinions expressed in this thesis are my own. In instances where someone else's work or ideas were used in the thesis, due acknowledgement was given and reference was made in accordance with requirements set out by the School of the Arts, University of Pretoria.

Marguerite van der Merwe

Date 28 September 2022

ETHICS STATEMENT

I, Marguerite van der Merwe (student number: 28006543), have obtained, for the research described in this work, the applicable research ethics approval. I declare that I have observed the ethical standards required in terms of the University of Pretoria's code of ethics for researchers and the Policy guidelines for responsible research.

Marguerite van der Merwe

Date 28 September 2022

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ABSTRACT

From a design education lens, this study aims to understand how play could be included as part of the student design process. Hence, the study is situated at the intersection of three key areas, namely play, design higher education, and the student design process. Although the concept of playful learning has been widely explored in early learning, there is a dearth of research with regard to how play could be integrated in the domain of design higher education. Accordingly, this study stems from a curriculum-based project facilitated in the BA Information Design programme at the School of the Arts, University of Pretoria. Making use of a collective case study methodology, and featuring two years of student projects (from 2019 and 2020) as cases, the study sets out to understand how play influenced students' design process. A case-based approach was feasible because of the rich data collected from the cases; the empirical evidence analysed in this study included student process documentations, reflection questionnaires, and final student projects. Each cohort of projects was analysed individually by means of a qualitative content analysis, resulting in a discussion of themes emerging from each case, as well as a summary of the students' design processes. Subsequently, the two cases were compared and analysed in a cross-case synthesis which consolidated themes emerging from the data, and presented a critical integration with the theoretical framework of the study. The cross-case synthesis resulted in a visualisation of themes from the empirical evidence, presented as a proposal for a play-fuelled pedagogy of design, which affords students the opportunity to relieve stress, build momentum, learn about themselves, challenge their assumptions, enable empathy, and remember to play. Closely aligned with the values of design for good and human-centred design philosophies, such a play-fuelled pedagogy of design could be extended to other domains of higher education.

Keywords: human-centred design, design education, design pedagogy, playful learning, play, design for children, co-design, participatory design, design process, design higher education, case study research methodology, collective case study, cross-case synthesis, qualitative content analysis, design research

CHAPTER ONE:
SITUATING THE RESEARCH

1.1 Introduction

The aim of this qualitative research is to understand how play may be incorporated as a meaningful part of the BA Information Design student design process. Research questions for this study emerged after facilitating a project with final-year BA Information Design students at the University of Pretoria, in South Africa; the project has been running since 2015. This research presents a case study focused on two years of teaching the project: 2019 and 2020. In 2019, the project was presented in its traditional form with contact teaching time and printed design deliverables as outcomes (as had been the custom for all prior years of teaching the project). In 2020, however, owing to the necessity of teaching online during the COVID-19 pandemic, all teacher-student interaction and design deliverables were completed virtually. The brief and pedagogic aims over these two years remained largely the same[2]: during the project, students were required to design educational, game-based interventions for children that address social issues in South Africa. Students were encouraged to understand the potential of design as a tool for social good: an inclusive and creative method for problem-solving that can connect with children and parents in an engaging and convincing way. Play was explicitly introduced in the form of a play workshop as part of the project process to enable students to better engage with the target audience they were tasked to design for. Furthermore, students were encouraged to play amongst themselves during the design process, as well as to prototype their toolkits with children through play. As such, the study aims to understand how play is manifest in the student design process: both in the instance of person-to-person teaching and in a virtual classroom. Making use of a collective case study research methodology, this exploratory and descriptive research involves the analysis of empirical data in the form of student reflection questionnaires; project process documentation; and an analysis of physical student projects or outputs[3]. Thus, the research aims to explore and describe how introducing play in the context of design higher education influences students' design process. This research hopes to make a contribution to South African design education

[2] Project briefs for the student cohorts of 2019 and 2020 are included in Appendix E and F, respectively.

[3] Transcribed recordings of class consultations recorded in 2020 were used to supplement the data and share insights from project facilitators, but did not form part of the formal data analysis.

discourse from an interdisciplinary vantage point. Insights gleaned from the research, as collated and presented as a model for a play-fuelled pedagogy of design, could also benefit future curriculum and project design within the BA Information Design course. Lastly, an understanding of BA Information Design student experiences and their process may help to improve teaching and learning.

1.2 Background and problem identification

The idea that there are similarities between the process of designing and the act of playing is not new. In 1965, seminal designer and educator Paul Rand (1965:155) asked how, when teaching students to design, one could best arouse curiosity, hold the student's attention and engage their creativity. The answer, according to Rand (1965:155) lies in the intrinsically playful nature of design. More than this, the presence of rules in the design process, as in the process of play, makes for a more interesting design experience and results in more meaningful design solutions. Specifically, Rand (1965:155) believed that

> problem[s] with defined limits, with an implied or stated discipline (system of rules) that in turn is conducive to the instinct of play, will most likely yield an interested student and, very often, a meaningful and novel solution.

Keeping this particular sentiment of Rand [4]in mind, I am curious as to what constitutes a "meaningful and novel solution" in the world of design education today. The position taken in this research is that the responsibility of the designer extends beyond the manufacturing of appealing commercial products or messages: the designer, and first the student of design, must situate themselves within their community in order to create designs that are truly "meaningful" and of value to society. Although it is true that the most visible manifestation of graphic design is arguably its commercial application – in the form of bespoke branding, advertising campaigns, typographic layouts and other published material – Andrew Shea (2012:8) argues that designers are increasingly using their skill sets for different work, labelled in various ways – design for social impact; human-centred design; or design for social change. In essence, these terms describe a kind of design where the designer aims to serve their community or greater society for good. Designers have the potential to take an active, participatory role in tackling complex social issues.

[4] Although design pedagogies have evolved since Rand's viewpoint on integrating play and design in 1965, the ethos of tapping into the imaginative and curious nature of play, and marrying this within the context of design higher education, is pertinent in the context of this study.

William Drenttel, in a foreword to *Designing for Social Change* by Andrew Shea (2012), explains the term 'social design' in a way that aligns closely with my teaching philosophy as a design educator. Drentell (in Shea 2012: 7) says that

> Social design cannot be considered a "subspeciality of the design profession (like graphic design, package design, product design, service design, and so on), but is a larger activity that depends upon design in all its forms – thought, processes, tools, methodologies, skills, histories, systems – to contribute to the needs of a larger society. It implies at once an attitude and an approach to life: as such, it can help us frame how we want to live in the future. It is therefore inherently pragmatic and results-oriented, simultaneously humble and ambitious, and fundamentally optimistic and forward-looking.

Notwithstanding the good intentions of social design, or design for good, it is necessary to acknowledge that efforts to implement design solutions 'for good' are sometimes misplaced or inappropriate. For example, Mahmoud Keshavarz (2020) critiques global efforts from the design community in response to the notion of "refugeehood" or "refugee crisis" reported by the media in 2015. Keshavarz (2020:20) argues that the way in which humanitarian design is approached by the "Global North" is problematic, and calls for "greater sensitivity from designers and design researchers" in this sphere. Furthermore, Keshavarz (2020:21) argues that, instead of approaching humanitarian design by "using their epistemic skill of "problem solving", designers should align with the politics of justice demanded by refugees and rethink their practice in solidarity with such politics". This critique by Keshavarz highlights the importance of not "othering" the human participants when approaching social design, or aiming to design 'for good'. It is thus important to adopt a nuanced, sensitive and critical approach, and, from the perspective of a design educator, to nurture the same critical approach when engaging with students. In addition, the act of designing cannot be separated from notions of politics or culture; and must take into account past injustices of oppression and colonialisation. The task of designing with human participants need thus be approached through experiential learning as well as in theory, where critical reflection on the part of the students and educators are foundational in the design approach followed.

In a foreword to Elizabeth Resnick's book, *Developing Citizen Designers* (2016), titled *Graphic Design and the challenge of Social Transformation,* seminal design author Victor

Margolin[5] (in Resnick 2016:14) advocates that the "graphic designer of the future must understand people and their cultural milieus. This stance becomes increasingly important in a global society where communication mediums are increasingly diverse, complex, and can be spread amongst vast audiences and populations. Moreover, Margolin (in Resnick 2016:15) argues that designers continually need to apply their skills of persuasion – which had previously applied mostly in commercial applications – for

> … promoting positive, social behaviour such as ethnic and racial tolerance, energy conservation, and overall environmental citizenship. Promoting behaviour change has, in fact, become one of the greatest tasks of the graphic designer.

In a South African context, students of design must learn to work within a global context, but also understand their role within a local context and the challenges this brings. In 2004, seminal South African design educator Marian Sauthoff discussed the need for critical discourse on the subject of graphic design in a South African context. Sauthoff (2004:35) called for "better balance and integration between the economic and social dimensions of design", as well as "critical introspection" and "rigorous research" in the domain of design. This call remains relevant; I propose that a better understanding of how design students approach problems, that is, their methods in approaching problem solving and design thinking processes, can make a contribution to design research and will benefit both design education and design practice. The research conducted for this study flows from teaching undergraduate design students at the University of Pretoria, who are enrolled in the BA Information Design programme in the School of the Arts. The ethos of the Information Design degree aligns with the sentiment that design can be an agent of social change, or that it has the potential to inspire a mode of enquiry in students that is curious, human-centred and oriented towards problem solving. In the Information Design study guide (2019:12), emphasis is placed on the fact that Information Design is a "humanistic discipline". The goal of the programme is to foster an attitude in students where they design with people in mind: "information designers must strive to enhance the quality of people's lives on a physical, cognitive, emotional and spiritual level" (Information Design Study Guide 2019:12). The programme challenges students by teaching them how to design meaningful solutions, within limited timeframes, while making use of sophisticated

[5] Victor Margolin (1941-2019) was a Professor Emeritus of Design History at the University of Illinois, Chicago and a seminal scholar in developing design history and design studies. Margolin was also the founding member of the academic journal *Design Issues* (first published in 1984) and served on the editorial board for the journal. Among his many publications, his most recent include *The Politics of the Artificial: Essays on Design and Design Studies* (2002), *Culture is Everywhere* (2002) and *The World History of Design* (2015) (Brown 2019).

design technologies, becoming versed in design terminology and theories, and applying their craft in practice to a level that is acceptable at an industry standard. Owing to the multiple demands of the course, an individual project in the course often does not focus equally on every skill level[6]. During their final year of study, all students engage in a "design for development" project. This project places particular focus on the role of design as a human-centred endeavour. As stated in the project brief, the ethos of the design for development project is "the view that Communication or Information Design can facilitate positive social change in a local context, specifically with regard to civic responsibility and, by extension, children's development through experiential learning" (Cassim & van der Merwe:1).

In light of adapting teaching to a virtual environment during the COVID-19 pandemic in 2020, the project duration changed from four weeks (in 2019) to six weeks (in 2020), to accommodate student challenges with regard to data accessibility and connectivity. Furthermore, the project outcome changed from the production of a physical, printed toolkit to a digital intervention, taking the form of an app prototype. Nevertheless, the overarching pedagogic aims and the essence of the project brief remained the same across both years. Students were required to engage with a particular community – in this case children – and identify a need or issue that their design intervention could address. The brief asks students to identify their own "wicked design problem". As a comment on the "Wicked Problems" theory initially developed by Rittel (1972), Buchanan (1992:16) sets out to understand not **that** design problems are "wicked" by nature, but **why** they are "wicked".

Buchanan's (1992:16) response to this inquiry is as follows:

> Design problems are "indeterminate" and "wicked" because design has no special subject matter of its own apart from what a designer conceives it to be. The subject matter of design is potentially universal in scope, because design thinking may be applied to any area of human experience. But in the process of its application, the designer must discover or invent a particular subject out of the problems and issues of specific circumstances.

Buchanan's (1992:16) explanation makes it clear that the act of "inventing a particular subject" arises from understanding "problems and issues of specific circumstances" and,

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[6] The BA Information Design course scaffolds various skill levels throughout the years of study. The first year of study is pitched at beginner level, progressing to an intermediate level during the second and thirds years of study. During the fourth year of study, the skill level is pitched as advanced. Students focus on developing professional practice, mastering the iterative design process, and grapple with issues of citizenship, research ethics and sustainability (Information Design study guide 2019:12).

by implication, that this is not an easy feat. In an attempt to guide students in this line of thinking – being able to identify, distil and address "wicked problems" in a community comprised of children – play was initially introduced as a part of the design process for this particular design for development project. As a response to the first year of teaching this project (2015), Dr Cassim and I co-authored an article themed around how design could use "generative play[7]" to innovate for social change with Professor Audrey Bennett (a visiting Melon scholar at the time of teaching the project). In this article, emphasis is placed on the need to "to nurture students with the necessary critical and applied skills to approach contemporary wicked problems in appropriate and meaningful ways" (Bennett, Cassim & van der Merwe 2017:58). At the time, we believed that introducing play in this particular project would help students to better understand their target audience (children and their parents), as well as the primary way in which children learn and engage – through play. As Maria Montessori (1973) famously attested, "play is the work of children". However, as the project unfolded (between 2015 and 2020), it became clear that the introduction of play did not serve purely as a means to aid problem identification or to empathise with children as an audience. Students benefited from having play introduced in the design process in a multitude of ways.

One conclusion drawn in the article that arose from teaching the project (Bennett, Cassim & van der Merwe 2017:68) served as a springboard for this doctoral inquiry:

> When one student says "Everyone can play but sometimes you just forget how to," this implies that generative play provides a common ground within the social innovation process for all participants involved and therefore democratizes both participation and creativity.

This notion of "democratizing both participation and creativity" (Bennett, Cassim & van der Merwe 2017:68) implies a more inclusive design process. As mentioned earlier, both Resnick (2016) and Shea (2012) advocate for designers to take on an active role in shaping their communities through the work that they do. This kind of design, championing participation and dialogue between the designer and the audience, is often approached

[7] Generative play is a "system of designing for social innovation" (Bennett, Cassim & van der Merwe 2017: 60), adapted from Jonassen and Rorner-Murphey's (1999) model of design as an activity system that produces an object with a specific purpose. In contrast to this more traditional model with a designer as 'creator' of an object to serve a commercial goal, generative play calls for a broadening in the design approach that sees the designer still taking the lead in the design process, but constantly collaborating with end-users while moving towards (generating) appropriate solutions. Play thus becomes a catalyst in the process of moving towards appropriate solutions, in participation with the audience being designed for (Bennett, Cassim & van der Merwe 2017: 60).

through what has been labelled an iterative design process. The process of designing collaboratively with end-users is also referred to as co-design, or participatory design, largely dependent on the level of involvement of the end-user and the role that the designer assumes in the design process. In the case of the Design for Development project, the process was participatory because the designer still took the lead in the design process, while collaborating actively with the target audience and various stakeholders, such as parents, teachers and child development experts. In this process, the idea that play can be a tool to "provide common ground within the social innovation process" (Bennett, Cassim & van der Merwe 2017:68) is one worth investigating further.

More than this, we noticed while teaching this project that students engaged deeply and with great commitment to the project overall. Class enthusiasm levels were high and a rigorous design and research process was followed. Furthermore, the quality of designed outputs throughout the years of teaching have been of a very high standard. This implies a correlation between student engagement and creativity and the introduction of play.

Again, the idea that there are similarities between the act of playing and the design process is not a new one. Derek Ham unpacks these similarities in *How Designers Play: The Ludic Modalities of the Creative Process* (2016). Ham (2016:1) notes that, although it is "impossible not to be creative while in a state of play", there are those that are sceptical of the benefits of play outside the domain of childhood. Ham (2016:1) also states that critical discourse on play is framed within the domains of child psychology and primary education, as it [play] provides a "telling story of the human condition". Ham (2016:1) continues that "play allows us to create in more intuitive ways", and that it "provides for moments of reflection and whimsical imagination". Based on our teaching experience, I agree with Ham's (2016:1) position that "the ways we learn through play present great opportunities to change curricula and instruction for design studies". This statement implies that play can be introduced not only as a component of the creative process (as was our initial intention with the project) but that it can become a more pervasive mode of working through the design process. During the Design for Development project (2015-2020), students weaved playing into their design process to such an extent that it permeated all aspects of the process – not only the initial phase in which it was introduced. Ham (2016:28) echoes the "wicked problem" sentiment when he states that "the process to finding a solution to any given problem is not linear". The non-linear nature of the design process is evident in the

use of an “iterative design process”, which game designer and theorist Eric Zimmerman (2003:176) describes in reference to game design and development:

> Iterative design is a design methodology based on a cyclic process of prototyping, testing, analysing and refining a work in progress. In iterative design, interaction with the designed system is used as a form of research for informing and evolving a project as successive versions or iterations of a design are implemented.

Ham (2016:28) is of the opinion that play can be instrumental in reframing problems when incorporated in the design process. He says that

> Seeing things in new ways is a core principle of play and an effect of being in the magic circle. Children do this intuitively; adults, not so much. Ove time, adults can develop diminished abstraction or playful thought. This is what happens when clouds in the sky become just clouds in the sky, and you can no longer see them with the imagination of a child. When children see clouds, they perform the mental transformation of meaning. The cloud can become a turtle or a dragon, depending on where their eyes and minds take them. We should all learn to play in our practice, and through this we can be more creative.

Ham (2016:20) references Roger Callois’s (1961) “taxonomy of play” and provides examples of how each kind of play can be translated in the design process. Furthermore, Ham (2016) uses several case studies, or snapshots from student design projects to illustrate how each mode of play was incorporated. Although these examples are helpful in cementing the idea that including play is valuable in the design process, the article does not follow the design process in its entirety and there is also no mention of how design students interpreted or experienced the act of play as part of their design process.

When one considers the wealth of literature advocating the benefit of playful learning in schools, particularly for pre- and primary school children, comparatively little research has been conducted on the introduction of play in the context of higher education. A paper by Louis Rice (2009), an educator in Architecture at the University of the West of England, makes a valuable contribution by exploring “the use of playful learning as an approach to teaching and learning” (Rice 2009:94). In this research, Rice (2009:94) leverages “playful aspects of the *dérive*” – an architectural approach to “understanding an environment developed by the Situationist group” – as a means to understand the benefits of playful learning for students. Rice’s (2009) research makes use of a case study, analysing empirical data based on student and teacher reflections, as well as survey work. Similar to the research this study aims to conduct, Rice’s research project began as a result of a “hunch or proposition about playful learning approaches which grew from [his] own experiences of

using the dérive" (Rice 2009:100) – in other words, his teaching experience. During Rice's project, students were engaged in activities that were "physical, actively engaging and had a clear playful element" (Rice 2009:101). Notable findings from Rice's (2009) study that resonate with our teaching experience (2015-2020) are outlined below:

- Many students made connections between play and the creative process (Rice 2009:102).
- Play enabled a heightened sensory awareness in students (Rice 2009:102).
- There was a shift from passive to active learning on the part of the student, where learning was informed more by the actions of the students than by the direction of the teacher (Rice 2009:104).
- Playing enabled students to practice their roles as reflective practitioners (2009:104).
- Play allowed for a free, spontaneous and creative space in which many ideas could be generated (Rice 2009:104).
- Playful approaches can be taken outside the world of academia and can become "hybridised between theory and practice" (Rice 2009:104).
- Because implementing playful learning in "modularised institution[s]" can be challenging, a shift is required that sees students as "active creators of knowledge" as opposed to "passive consumers of knowledge" (Rice 2009:104).

From an epistemological perspective, Rice (2009:96) comments that "playful approaches to learning are situated in a constructivist theory of learning". The idea that students partake actively in their learning within this paradigm, coupled with the notion that there is no "single universal truth", but rather many versions and possibilities of truth/ knowing, can be a challenge that students may struggle to grapple with in a higher education context (Rice 2009:96). Based on my own teaching experience, I support Rice's (2009:96) argument that some change – referred to here as an "ontological change" needs to take place in students for deep learning to occur. For the purposes of this study, deep learning is framed as learning springing from, and enriched by experience and practice. This is in line with Donald Schön's philosophy of the reflective practitioner, where learning takes place through action and reflection-on action. In addition, a definition in a white paper by the Lego Foundation (2017:9) resonates with the position taken in this study – that deep learning "allows us to connect factual knowledge with real-world applications and really grasp their implications". To solidify the argument for playful approaches to learning, Rice (2009:96), maintains that

play can help students to be more flexible in their thinking by challenging preconceptions, and by encouraging the interpretation of multiple realities.

Rice's teaching follows a constructivist paradigm, which aligns with teaching philosophy we employ for the Design for Development project. Rice (2009:97) comments that,

> Constructivism requires students to be challenged and engage with difficult knowledge at times to enable the transformation of knowledge for each student, and this in turn requires alternative approaches to didactic teaching. Playful approaches to learning are one of the ways in which that can be achieved, playing with notions, conventions or breaking habits and habitual behaviour.

Finally, Rice (2009:104) notes that "playful learning can enrich and augment existing approaches to learning for students in higher education". This notion is also reflected in a report by the Centre for Universal Education at Brooking, which stipulates that the inclusion of play during learning can facilitate critical thinking, creativity, collaboration, and problem solving (Care *et al*. 2017).

Also advocating for the integration of play in higher education, editors Alison James and Chrissi Nerantzi, in the volume *The Power of Play in Higher Education* (2019), present sketches and case studies demonstrating how play has been incorporated in a broad range of disciplines, albeit no examples are mentioned from a South African context. Some examples include: harnessing play to teach new academics pedagogic theories, by means of a team-based, escape room activity (Mills & King 2019:33-41); using a behaviour modification game to illustrate the theory to students of psychology (Roberts 2019:55-56); and a "Culture Shoe Box" activity designed to teach ethics to postgraduate dental students, and cultural communication to undergraduate business management students (Wassif & Zakher 2019: 117-119). Speaking from his experience as a professor of creativity at the Cardiff School of Art and Design, Gareth Loudon (2019:67-74) states that play forms an integral part of the creative process in his classroom. Loudon (2019:68) continues that "students need to play with thoughts as well as form (through making) to help discover new and unusual connections, to gain new insights and to improve their skills." In addition to this, Loudon argues that adopting a playful attitude is a key strategy in enabling creativity and divergent thinking amongst students. This is relevant particularly in the context of design education, where, similar to the design process followed in architecture (as described by Rice 2009), students are already engaged in a creative problem-solving process that calls for divergent thinking.

1.3 Research question and research objectives

Research conducted by Rice (2009), as well as the range of vignettes compiled by James and Nerantzi (2019), highlight the need for additional research on the introduction of play in the context of higher education. It has become evident through my teaching experience that play has an influence on the student's approach to a design problem, and on their experience of learning in the classroom. Many of the experiences that BA Informartion Design students have noted in their reflections over the past five years correlate with Rice's (2009) findings, especially in the sense that play can be used as a bridge to enable a transformative learning process in students. Therefore, what this study seeks to explore and describe, is:

*How does introducing play in the context of design higher education influence students' **design process***?

Objectives branching from the research question are to explore and describe the following sub-questions:

- What is unique about the 'student design process' when compared to the widely adopted "iterative design processes"?
- How do students experience the act of play as part of their own design process?
- How are these experiences manifest in tangible design outcomes?

The research question, as well the objectives outlined above, all aim to explore what happens at the intersection of three key areas, namely the introduction of play; the student design process and the context of design higher education (as illustrated in Figure 1). As a response to the research question and objectives outlined above, this study presents a visualisation of a play-fuelled pedagogy of design as a consolidation of themes emerging from the research. Working definitions for this study with regard to the terms **play, design higher education** and **iterative design processes** are provided in Chapter Two.

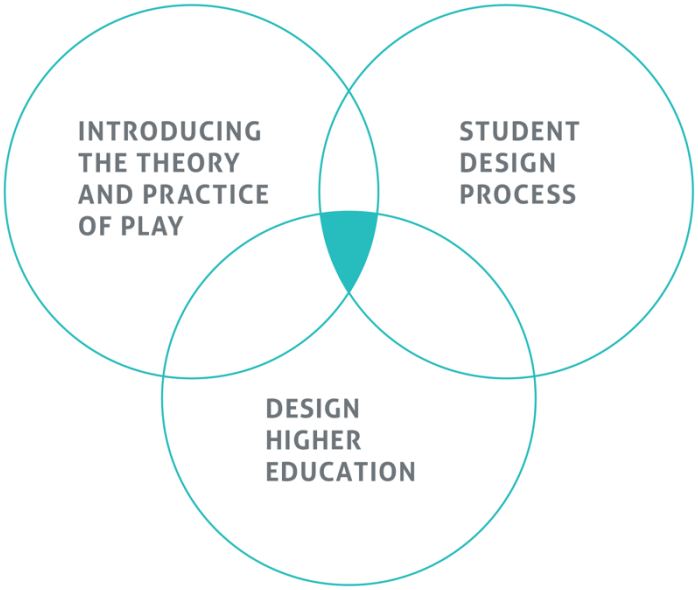

Figure 1: Research question: three intersections

1.4 Research methodology and methods

This research is positioned as a qualitative study, and follows an explorative and descriptive approach to enquiry. The philosophical position taken in this study aligns with a constructivist / interpretivist research paradigm, where emphasis is placed on human interpretation and nuanced meaning-making. As such, research interpretations are influenced by the position of the researcher; research questions are often informed by the context of the researcher; and the research process requires an "investment of the self" (Birks 2014:9). Furthermore, this study is aligned with a relativist ontology, viewing reality as a subjective construct (Birks 2014:7). From an epistemological perspective, this study assumes the view that knowledge generated would reflect the subjectivist views of those involved in the research process, and in particular the views of the researcher. Consequently, understanding the axiological perspective of the researcher becomes paramount. In this study, my view as educator is aligned with Schön's (1983) philosophy of being a reflective practitioner.

Flowing from the philosophical underpinnings discussed, this study employs a case study research methodology, more specifically making use of a collective case study (Yin 2018). Case study research requires a thorough understanding of the context and boundaries defining the case(s) (George & Bennett; Cresswell & Poth 2016; Yin 2018). As such, first-hand experience and teaching observations from facilitating both Design for Development projects lends credibility to adopting a case study research methodology. In addition, a

benefit of case study research is its emphasis on drawing from multiple sources of evidence (Yin 2018; Cresswell & Poth 2016). Hence, the wide variety of evidence produced during both Design for Development projects, enables a rich and nuanced interpretation of data. This collective case study considers each Design for Development project as a holistic case, before arriving at a cross-case synthesis. Within each case, qualitative content analysis is used as a research method to analyse the empirical evidence collected from both cases. Themes generated from the qualitative content analysis are categorised and synthesised by making use of a cross-case analysis. In this synthesis, themes emerging from both cases are also discussed with regard to their relationship with the theoretical framework of this study.

1.5 Outline of the thesis

The structure of the thesis has been designed to best answer the aforementioned primary research question. Accordingly, Chapter One provided the background, overview, and context of the study. In addition, Chapter One outlined the problem statement, main and sub research questions, as well as the aims and objectives of the study. As the study makes use of a case study research methodology, it is imperative that the study is positioned within a sound framework of theory to support the research. Consequently, Chapter Two of this study comprises the literature review and theoretical framework for the study. An objective of Chapter Two is also to arrive at working definitions for the three areas of research that intersect to answer the research question, namely design higher education, play and the student design process.

Chapter Three provides context for this collective case study. This is done by outlining the context of both cases comprising this collective case study, namely the Design for Development projects of 2019 and 2020. First, Chapter Three zooms out to consider the context of design higher education in South Africa, before providing context on the BA Information Design programme. Thereafter, I demonstrate how the Design for Development project fits into the BA ID curriculum. For each case, context is also provided on the project scope, brief and approach; this context is supported by visual examples of student projects. The purpose of Chapter Four is to outline the research design of this study, and to demonstrate how this design is best suited to answering the research question. As such, Chapter Four discusses the philosophical underpinnings of the research, as well as the philosophical position taken by the researcher. Furthermore, the research methodology and

methods, as well as the units of data collection, and ethical considerations, are discussed. Chapter Four also outlines a framework for validating the research (Cresswell & Poth 2016), which is ultimately used to conduct a self-assessment of the validity of the findings.

Chapters Five and Six comprise the analysis of the cases in this collective case study research. To begin, Chapter Five considers each case holistically, and data is analysed by making us of qualitative content analysis. Evidence from the empirical findings is included in the form of quotes to substantiate the grouping of themes as they emerged from the data. Subsequently, Chapter Six, as the penultimate chapter of the study, constitutes the synthesis of the case study. Making use of a cross-case analysis, themes emerging from each case are grouped and presented to relay the findings from the empirical evidence in the form of a critical discussion. This discussion includes an integration with extant theory, as well as a visualisation of how the themes identified influenced the students' design process. Subsequently, themes from the cross-case synthesis are collated and presented as a model for a play-fuelled pedagogy of design to conclude the chapter. Chapter Seven concludes the research. The former part of Chapter Seven presents an overview of the study, followed by a reflection of the aims and objectives and a discussion of how these have been met through the research. A self-evaluation is conducted on meeting the criteria of conducting case study research. Lastly, opportunities for further research are discussed.

CHAPTER TWO:
LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

As per Cresswell and Poth's (2016:366) suggested approach to structuring case study research, Chapter One of this study sketched a "vignette" of the cases under investigation, to provide context and a sense of "time and place" that make the cases unique. Following this, Chapter One also served to provide background on the researcher and to identify issues, or research questions, surrounding the cases (Cresswell & Poth 2016:367). The purpose of Chapter Two is to "provide a more extensive description of the case and its context" (Cresswell & Poth 2016:376) by surveying a body of appropriate data to frame the study. As explained by Fouché and Delport (2002:129), a research problem is to be "located in a body of theory", with the aim of arriving at a "framework of theory" once relevant literature has been surveyed and a determination has been made as to where the body of research could be situated within existing scholarship. Thus, this literature review provides a brief conceptual framework for the three key areas that intersect in this research, namely design higher education, the student design process and play. Situated within the domain of design theory and, more specifically, focused on the domain of design higher education research, the first section of the literature review provides a background on **design higher education**. This section also outlines the approach followed in the BA Information Design course at the University of Pretoria, the context in which the case study is situated. A typical **student design process** followed in a curriculum project in the Information Design course is explained. Next, the background behind the concept of **design thinking** is discussed, in part to explain what has widely been named the **iterative design process**. Finally, the literature review provides background on the broad concept of play and narrows this concept down to arrive at an understanding of three aspects of play, namely **being playful**, **play activities** and **formalised game play**. An understanding of how play fits into the domain of higher education, and more specifically design higher education, is also included in this section.

2.1 Design higher education: background

In its early days, graphic design emerged primarily as a craft-based, technical discipline where master-apprentice relationships were championed as a means of knowledge transfer. The transition of graphic design from a trade-based to a professional endeavour in the early-twentieth century called for increasingly rigorous teaching methods and academic

approaches to the training of students of graphic design. Kees Dorst, in *Frame Innovation: Create New Thinking by Design* (2015), explains that the notion of "design practice" has moved beyond the traditional interpretation of design being a means to create beautiful objects. On the contrary, Dorst (2015:41) argues that design can present a "real alternative to conventional problem-solving strategies". This shift in focus from beautification to strategic problem solving, as well as the rapid expansion of the design industry, also calls for different approaches in pedagogy as well. Owing to varying approaches of training academies and higher education institutions concerning the education of a designer, there is much debate surrounding pedagogy, the future of a design curriculum and the terms used to describe a 'design professional'. In 2011, Icograda[8] published an updated *Design Education Manifesto* (Bennett & Vulpinari 2011), dually in response to the Icograda manifesto *Oullim* (2000), and the shifts that had taken place in the field of communication design since its first publication (Atzmon 2014:116). Although the Icograda manifesto of 2011 has been critiqued as suffering from 'lite editing' by Leslie Atzmon (2014:116), in a *Design Issues* review[9], she makes the point that "communication design has struggled to find and express a diverse, formidable voice" and applauds the manifesto for "championing international issues in communication design".

The traditional description of 'graphic designer' falls short in encompassing the myriad of roles students of design, and design professionals, engage in today. In the Icograda manifesto, JP Pido (2011:109) advocates for the term 'graphic design' to fall under the umbrella of 'visual communication design.' According to Pido (in Bennett & Vulpinari 2011:109), this inclusion is more appropriate to the democratic nature of 'visual communication design', as the notion of 'communicating with the visual' has become ubiquitous and accessible – whether by design or consumption – to most members of society. This wider classification, Pido (in Bennett & Vulpinari 2011:109) argues, compels discussions regarding the "principles of good, conscious and well-critiqued design".

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[8] Icograda (the International Council of Graphic Design Associations) is an organisation that aims to "promote and represent design as a medium for progressive change" and has been in operation for nearly sixty years (founded in 1963). As part of their mission in advocating for the value of design, Icograda supports "the development of design education (practice, theory and research)" (Icograda 2020).

[9] Lezlie Atzmon is a Professor of Graphic Design and Design History at Eastern Michigan University and is currently edits the journals *Design and Science, The Graphic Design Reader* and *Encountering Things* (Leslie Atzmon 2020). Atzmon (2014:117) is concerned chiefly that the Icograda Manifesto (2011) could be more sharply aligned to its aims through better editing and that the inclusion of too many essays causes unnecessary repetition. Atzmon (2014:117) also argues that the introduction is too broad and not directly aligned to its aims.

The position taken in this study, however, is that the term ‘visual communication design’ or even ‘communication design’ is too narrow a framework to describe some briefs undertaken by students and professionals, who may design spaces, objects, experiences, play interventions, digital user interactions, or coordinate community projects. Although there is no doubt that designing ‘communication’ would play an integral role in all of these functions, the focus is often more on a mode of thinking and doing in a critical, designerly way. In an article titled, *A Brave New Creativity*, Donald Welch and Jennifer Loy (2013:91) write that design no longer follows an industry-based approach. Rather, similar to the sentiments expressed here, Welch and Loy (2013:91) state that “[design is] an approach, an attitude with ways of thinking that can contribute to all programmes across the university system”. Welch and Loy (2013:91) further argue that a new cohort of design students need to be engaged in “authentic, complex problem-based learning”, in order to equip them with the tools to tackle wicked problems. Welch and Loy (2013:92) recognise that ensuring engaged and empowered students, while involved in problem-based learning, that “[addresses] the complexity of projects that are no longer discipline specific” is a challenging task. Thus, the literature reflects a need for styles of thinking in design students that are innovative, rigorous and divergent. Students need to work within the constraints of a problem, but be able to subvert or reimagine the scenario or problem in a myriad of ways to conceptualise truly collaborative and innovative solutions. The intrinsically playful nature of design (Rand 1965:155) provides an opportunity for the student design process to adopt elements of play in pursuit of solving wicked problems. To build on this argument, section two of this literature review expands on the notions of design thinking and iterative design processes, which have been implemented (to varying degrees) in design education.

In the Icograda manifesto, Pido (in Bennett & Vulpinari 2011:109) argues that there is a need for “more intimate interaction with other disciplines”. The term ‘interdisciplinary’ has become somewhat of a buzz word in academic circles. However, when advocating for design education that equips students with skills to design meaningful solutions for universal – or sometimes extremely localised – audiences that operate within a wide range of disciplines, it is essential that design education ventures further than its traditional field. Collaboration with disciplines such as psychology, anthropology, art history – as Pido (2011:109) suggests – as well as some of the ‘hard sciences’ (engineering, software development), medicine, education and early childhood development, not only equips students to design for a wider audience, but helps them to understand how the process of design – and ‘design thinking’ – can be applied in an ever-shifting landscape while engaged

in complex briefs from varying industries. In this rapidly evolving landscape, where design by its very nature is constantly in flux, it is necessary for the role of the design educator to evolve and become more democratic: instead of providers of knowledge, the design educator becomes a "mediator of knowledge" who "inspires and facilitates" (Pido in Bennett & Vulpinari 2011:109). With regard to the interdisciplinarity of design and design education, the application of design within an interdisciplinary landscape calls for both expert (where expert refers to disciplinary depth in design) and generalist (with regard to an awareness and sensitivity to a broad range of contexts and end-users) approaches in the field of design. In the context of design education, Hye-Jin Nae (2017:846), supports this notion by emphasising the need for design education to "follow and create design-based learning opportunities across broader domains." Furthermore, I would argue that the role of a design educator is also to challenge, to mentor and to develop a trust relationship with students that allows for dialogue and collaboration – so that learning is shared between student and educator. In an essay on updating the manifesto*,* Hugh Dubberly (2011:80) writes that "a post-industrial design education system can no longer rely solely on tacit learning. It must also turn tacit knowledge into explicit knowledge". In addition, embedding experiential learning[10] practices in design education is well suited to the practice-based approach of the discipline.

Bearing in mind that the Icograda *Design Education Manifesto* was last updated in 2011, many of the calls for reform or reinvention in the design education sector are still under construction or consideration. For example, in the manifesto, Dubberly (2011:81) argues that design education often continues to reflect "design's origins in craft work" and calls for a "re-inventing [of] design education". Meredith Davis[11] (2011:75) also advocates for a more democratic approach to design education that embraces and responds in agile ways, to complexity. Davis (2011:75) argues that the "shift in control from designing *for* people to designing *with* people and *by* people requires new methods" and that this raises questions as to how design educators can best equip students for these kinds of collaborations.

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[10] With regard to understanding experiential learning, this study refers to Kolb's (2015:77) experiential learning model. This is discussed in more detail in Chapter Six.

[11] Meredith Davis is a Professor Emerita of Graphic Design at NC State University and is a seminal design author, educator and advocate for design pedagogy. Davis has published extensively on the topics of design theory, typography and design education. She is a member of the editorial board of the Design Issues journal and reviews (among others) manuscripts for *MIT Press, International Journal of Design, Design and Culture, Iridescent* (Icograda's publication) and the *Design Studies* journal (NC State University 2020).

In her book *Teaching Design* (2017), published six years later, Davis (2017) reiterates the concerns discussed in the Icograda manifesto (2011). She writes that,

> [c]learly it is time for a new educational paradigm that in many respects breaks the lineage from early craft guilds and drawing schools, while maintaining the focus on intellectual flexibility and concern for human values that are characteristic of the earliest design practices.

Davis (2017:42) also argues that a proliferation of networked technology and an increased blurring of disciplinary boundaries, in both design industry and education, "call into question the efficacy of traditional approaches to framing and solving problems in design education as well as practice". The need for alternate modes of problem solving, and the potential for designers to reframe problems in new ways, is tackled comprehensively by Dorst (2015)[12], who suggests that traditional, deductive modes of problem solving are no longer sufficient when approaching dynamic, networked and complex problems. As an alternative to deductive problem-solving approaches, Dorst (2015:53) champions abductive reasoning, where "framing" is championed as a means to approach complex or paradoxical problems, with the intent of grappling critically with the problem to arrive at the most appropriate solution, informed by history and context. The concept or act of "framing" requires working backward when problem solving, by focusing on the desired outcome rather than the problem, in pursuit of a possible solution (Dorst 2015:52-54). A call for design-led approaches to problem solving (Dorst 2015; Davis 2017), in both education and industry, strengthens the case for understanding how design thinking methods, strategies and approaches are incorporated in design higher education.

2.2 Design pedagogy and pedagogic styles

Although the focus of this study is not on developing design curricula, a complex design problem in its own right, it is useful to understand the trajectory towards approaching design education as a means to equip students with modes of thinking and problem solving that champion people and the facilitation of meaningful interaction in the design process. As one of the aims of this chapter is to provide an overview of the context of the case study (Cresswell & Poth 2016:366), situated in the realm of design higher education, it is pertinent

[12] Dorst's (2015) theories on innovation through design thinking are discussed in greater detail in the design thinking section of this literature review.

to understand broader pedagogic approaches adopted in this field. Providing such an overview is also in aid of recognising which pedagogic approaches were employed in the case studies, that is the Design for Development projects of 2019 and 2020. In *Teaching Design* (2017), Davis aligns her description of design pedagogy with that of Lee Shulman (2005), who defines "signature pedagogies" as "characteristic forms of instruction used to develop future practitioners or scholars within a field" (Shulman in Davis 2017:81). In the field of design, the studio is seen as the "signature pedagogy of design" (Davis 2017:81). Keeping with Shulman's (2005) delineation that there are three dimensions of pedagogy, Davis (2017:81), explains these three dimensions in relation to design higher education:

- *Surface structure:* This structure works on an operational level, mostly defined by projects and "communicated through faculty-authored briefs and introductory presentations" (Davis 2017:82). Technical demonstrations, desk critiques and discussions of concepts also form part of this traditional and long-established surface structure (Davis 2017:82). An example of this surface structure would be that design students are given a brief, provided with an overview of the project context and guided through examples of similar solutions. Thereafter, students could work on projects with intermittent desk-based critiques to monitor their progress, or engage in class discussions to compare solutions and learn from their peers.
- *Deep structure:* A "deep structure of design pedagogy" becomes evident when students become immersed both in "the overarching questions of the design discipline" and in "the process-oriented work of practice" (Davis 2017:82). This approach to learning champions learning through process, and there is an implication that knowledge is deepened and strengthened when students complete various design projects with different parts of the design process prioritised. Various acts in the design process are grouped into this kind of pedagogy, namely: observation, diagramming and sketching, and prototyping (Davis 2017:83). Davis (2017:83) notes that the design process is "a multifaceted concept" that can be adapted based on the demands and context of the problem at hand.
- *Implicit structure:* This structure becomes visible by the manner in which design faculty "frame investigations" (Davis 2017:83). Elements of this framing include content to be included or excluded from the design brief, the kinds of examples shared with students, as well as feedback to students during the course of a project (Davis 2017:83). Davis (2017:83) makes a valuable point when she argues that

> design is never free of bias, and that "faculty impart values and perspectives throughout their interactions with students in the classroom".

Davis (2017:84) cautions that the repeated use of a particular pedagogy, or even a repeated mix of pedagogies when applied consistently or without critical consideration in a design programme, could result in teaching being "at odds with emerging paradigms in professional design practice". Furthermore, Davis (2017:84) is concerned that undergraduate students of design often "receive" rather than "frame" investigations themselves. The danger in presenting investigations at a design higher education level that lack necessary complexity and constraints, would be that students would only to learn to cope with more complex and networked problems as design professionals (Davis 2017:84).

To better understand what a design pedagogy that encourages critical thinking, is grounded in human values, and serves the needs of a rapidly changing design industry might look like, a summary of Davis' (2017) interpretations of design pedagogy in higher education is provided in Table 1. Davis (2017:91) notes that studio projects, or the studio learning environment, constitute the "signature pedagogy" of design. This is in keeping with the pedagogic approach followed in the BA Information Design programme at the University of Pretoria, in which the case studies are situated. Furthermore, Davis (2017:85-89) explains the pedagogic styles that are often employed in design higher education programmes (the art direction approach, the Socratic method and a coaching pedagogy). Lastly, a valuable pedagogic contribution by Davis (2017) is the suggestion that design tactics, or strategies, that are often employed in industry or by practicing designers, could also be leveraged to teach design. In other words, these design strategies could be harnessed in the creation, or "framing" of project briefs, and could be integrated in the process of teaching to teach *through* the design process. Examples of these design strategies are shown in Table 1. To conclude this section, I provide a summary of the pedagogic approaches, pedagogic styles and pedagogic strategies that were employed in the case studies to illustrate the theory in practice. In addition, I highlight some of the "teaching through design" (Davis 2017:171-1934) strategies that were employed as part of the pedagogic approach followed in the case studies.

<table>
<tr><th colspan="3">STUDIO PROJECTS: SIGNATURE PEDAGOGY</th></tr>
<tr><td colspan="3">

A studio-based class structure originated in the seventeenth-century École des Beaux-Arts and follows a constructivist approach to education, where students share responsibility for their learning and learning happens in a social environment. (Davis 2017:91-92)
Various tools can be employed in a studio setting to facilitate learning, including design exercises, design puzzles and design projects (Davis 2017:92-93).
Design projects are more hefty and are often used as a key component in design curricula. Key characteristics of design projects are that they should be open-ended, situated in context (real or hypothetical), and they must address the needs of someone other than the designer; this could include being human-centered and participatory in nature (Davis 2017:93-99). Design projects should also be value-oriented and can never be free of bias (Davis 2017:100). Design projects that are integrative reflect the intrinsic interdisciplinary nature of the design profession. A good way to introduce students to the interdisciplinary nature of design practice is to introduce them to a diverse range of field experts and sources to broaden their knowledge (Davis 2017:102). Lastly, design projects should be assessable and performance criteria needs to be clear in its definition so that students can be held accountable for meeting expectations throughout the course of the project (Davis 2017:103).

</td></tr>
<tr><th colspan="3">PEDAGOGIC STYLES</th></tr>
<tr><th>Art direction</th><th>Socratic method</th><th>Coaching pedagogy</th></tr>
<tr>
<td>The teacher is the expert in the classroom and a high value is placed on the aesthetic qualities of a design (Davis 2017:85).</td>
<td>Questions are posed to students and they are encouraged to answer the questions. This method is often more useful for advanced students to develop their personal perspectives on issues or to refine specific problems. This style of teaching encourages reflective thinking (Davis 2017:87).</td>
<td>In a coaching pedagogy, the teacher falls between an expert and someone who offers "reflective prompts." The teacher suggests potential avenues of exploration, provides guidance on time management and acts as a project mentor or "coach" (Davis 2017:87-89).</td>
</tr>
<tr><th colspan="3">PEDAGOGIC STRATEGIES: TEACHING THROUGH DESIGN</th></tr>
<tr><th>Scenarios</th><th>Personas</th><th>Analogical thinking</th></tr>
<tr>
<td>Design problems are "nested" in particular scenarios, using narrative to orientate students and provide context for the design problem (Davis 2017:171).</td>
<td>A persona is constructed as a character based on "real people who stand in for different stakeholders in a scenario." Using scenarios coupled with personas helps students to empathise while grappling with design problems (Davis 2017:176).</td>
<td>This kind of thinking harnesses information from "opposing" sources to stimulate creativity. Something "known" can be compared to something seemingly unrelated to spark novel solutions (Davis 2017:179).</td>
</tr>
<tr><th>Visualisation</th><th>Simulations & prototypes</th><th>Competing constraints</th></tr>
<tr>
<td>Visualisations are employed by designers to clarify ideas, to model possible solutions and to communicate their thinking. Models and diagrams, concept maps and storyboards are all different forms of visualisations (Davis 2017:183).</td>
<td>A simulation imitates "a real-world process or system behaviour over time", where a prototype is an early-stage representation of a solution to a problem that can be tested to determine its efficacy. Both simulations and prototypes help designers to refine ideas and move towards workable solutions that can operate in real-world contexts (Davis 2017: 191).</td>
<td>In this strategy, designers learn to balance various constraints in a problem, in order to find a solution that addresses the key constraints while having the least negative impact on any "competing constraints (Davis 2017:193)".</td>
</tr>
</table>

Table 1: Design pedagogy and pedagogic styles, adapted from Davis (2017:85-105;171-194).

In reviewing literature on design higher education, it becomes clear that much is written about aspirations for qualified designers, as well as which kinds of projects or media should be covered in a design curriculum. Davis' (2017) explanation of design pedagogy, and in particular her suggestion for a pedagogic approach that teaches through the design process, provides a useful theoretical framework from which to analyse the pedagogic approach followed in the case studies. Some themes, or core characteristics, to be nurtured in student designers that emerge from the literature are: that designers should be adept critical thinkers (Davis 2017), that they should ground their work in values and understand that design is never free of bias (Davis 2017), that they should champion the needs of others in their work (cultivating a human-centred approach to design)(Davis 2017; Resnick 2016), and that they should be able to operate comfortably within interdisciplinary environments.

To reiterate Margolin's (in Resnick 2016:15) viewpoint; he argues that, in pursuit of becoming citizen designers, the ability to promote behaviour change is another core skill for designers. In line with Resnick's articulation in *Developing Citizen Designers* (2016), design citizenship is framed in relation to design pedagogy, considering how the values of socially responsive design and civic values could be imparted to developing designers. Furthermore, Sauthoff (2004:35) calls for increased critical discourse and "rigorous research" in the domain of design, specifically within a South African context. A gap thus emerges in literature surrounding the following questions:

- Could there be a design pedagogy that encourages collaboration, design citizenship, is playful, and includes play in the pedagogic and design processes?
- Could a more playful approach to design pedagogy remain rigorous, ethically sound and follow purposeful research and design processes? Could this approach reflect localised (particularly South African) practices while remaining globally relevant?

In conclusion to this section, I present a working definition for the term **design higher education** for the purposes of this study:

DESIGN HIGHER EDUCATION

A formal learning environment in which students of design learn in-practice about design processes and design craft, towards creating products, services and design interventions that serve a society beyond themselves in ethical and appropriate ways. Pedagogic approaches include teaching and learning through studio-based projects to solve complex and multi-layered problems in the hopes of fostering critical thinking and problem-solving skills in students of design.

2.3 BA Information Design at the University of Pretoria

The goal of the BA Information Design programme, at the School of the Arts, University of Pretoria, is to "foster and nurture in students a people-oriented attitude" and "deep rooted understanding and mastery of a set of discrete skills in design thinking and making" (Information Design Study Guide 2019:12). While training students to be reflective practitioners (Schön 1983), there is a hope that fostering a people-oriented approach to solving "wicked problems" (Buchanan 1992) might ultimately cultivate design practitioners that strive towards the greater good of society (Information Design Study Guide 2019:12).

Donald Schön (1983), a seminal philosopher of design and design education, coined the term "reflective practitioner". This concept is in keeping with Schön's (1983) aspiration to "illuminate the process of practical inquiry by combining conceptual analyses with empirical studies of expert practitioners" (Waks 2001:37). Schön developed an epistemological alternative to the notion that scientific exploration must precede the practical application of knowledge (Waks 2001:39). Rather, Schön (1983) posited that the practices of professionals, based on experience rather than pure science, was inextricably linked to professional knowledge (Waks 2001:39). Thus, practitioners of design "apply tacit knowledge-in action", always functioning within the "languages of practice" when approaching complex problems. Even the act of reflecting-on-action, for Schön (1983), happened in an environment not removed from tacit knowledge and "languages of practice" (Waks 2001:40).

In keeping with Scön's philosophy, practical design teaching (including theoretical underpinnings and research) in the Information Design programme always take place within the context of practice. The "signature pedagogy" adopted in the Information Design programme is thus the studio, based on a system of scaffolding design projects dependent on the skill and rigour each project requires. Projects thus become more involved and complex, particularly with regard to demands on critical thinking and problem-solving skills required, as students build on their skills at each level of study. This model is similar to Davis' (2017:92-95) explanation of "the studio project as the signature pedagogy of design". The pedagogic style that most closely aligns with the approach followed in the Design for Development projects (2019 and 2020), or the case studies, is what Davis (2017:87-89) describes as a "coaching pedagogy". With a "coaching pedagogy," the lecturer takes the position of project facilitator, coach and mentor and falls somewhere between an expert and someone who "offers reflective prompts" (Davis 2017:87). During

both the Design for Development projects in 2019 and 2020, emphasis was placed on independent learning and building an environment of mutual trust, following a constructivist approach to education (Davis 2017:91). Feedback provided to students served to steer them toward new avenues of thinking, with a focus on exploration and experimentation, while encouraging students to adopt a playful approach in their work. A typical project process followed by students during an exit-level Information Design project is shown in Figure 2[13]. This process diagram shows alternating patterns between divergent and convergent thinking modes. Students widen their exploratory lens, for example, when conducting research at the onset of the project, then narrow their focus once they have identified their own slant on the project brief. Thus, students are empowered to identify their own "wicked problem" within the parameters of the project brief. The blue dots in the diagram indicate spaces for intervention, dialogue, feedback or collaborative ideation between students and project facilitators (lecturers) and peers. During these sessions, students are "coached" in order to continue their project process. Depending on the outcomes of research conducted by students, technical constraints or feedback provided during class, students often move back and forth between various phases of the process. Thus, this design process is iterative, and has much in common with the "iterative design processes" described by IDEO (2020), and design thinking theorists Tim Brown[14] 2009) and Kees Dorst (2015), as well as theorists of game design, such as Salen and Zimmerman (2004). These design processes are explored in more detail in the next section of this literature review.

[13] A more specific process model for each case study (particular to the Design for Development projects of 2019 and 2020) is included in Chapter Three of this study.

[14] Although Tim Brown's approaches design thinking from a popular, pragmatic perspective, design methods and processes adopted by companies like IDEO are widely available and often serve as an entry point for students to the concept of design thinking.

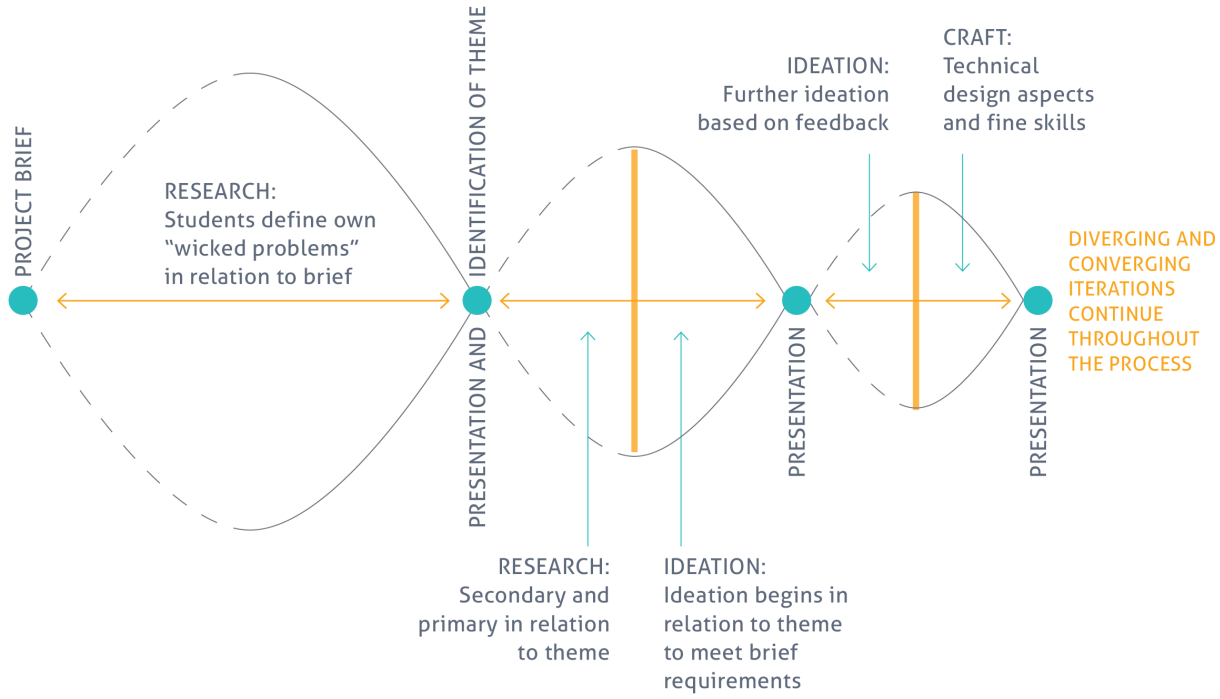

Figure 2: General final year Information Design project process

2.4 Iterative design processes and design thinking

As has become evident in the previous section of this literature review, design processes followed in the Information Design course align closely with design thinking philosophies and processes from contemporary design discourse. Fatima Cassim (2013:192) explains that, within a "widening domain of design, design thinking has surfaced as an important design tool or skill for innovation in general and more specifically, social innovation". The essence of design thinking came in response to questions surrounding the contribution that design can make to society, other than its commercial contribution. Buchanan (1992) framed challenges surrounding design thinking in his work (building on Horst Rittel's work in the 1970s) regarding the notion of "wicked problems" (complex, open-ended and ambiguous problems), as discussed in the introduction of this study (IDEO Design Thinking 2020). Similar to Buchanan's (1992) framing of a "wicked problem", Kees Dorst (2015), writes that problems faced by contemporary society are increasingly "open, complex, dynamic and networked". As a result of this complexity, Dorst (2015) argues that, instead of placing our focus on the notion of problem-solving, focus needs to be shifted to "framing" problems in new ways in the search for suitable methods to address them. The position taken on design thinking in this study aligns closely with that of Dorst's (2015), particularly

in relation to his argument against 'trendy' applications of design thinking strategies as a blanket approach to problem-solving. Dorst (2015:1) writes that,

> [t]he application of some cool design tricks and techniques, although liberating, doesn't often lead to the results we really need. I will argue that this is because the interest in "design thinking" mostly focuses on the designer's abilities in generating solutions, rather than on the key ability of expert designers to create new approaches to problem situations ("framing").

Since this study seeks to explore and describe *how introducing play in the context of design higher education influences students'* ***design process***, a key objective of the study hinges on developing an understanding of how the student design process is unique when compared to widely adopted iterative design processes, such as those featured in popular design thinking approaches and methods. Towards meeting this objective, this literature review looks primarily at the work of Tim Brown[15] in *Change by Design* (2009) and Kees Dorst[16] in *Frame Innovation: Create New Thinking by Design* (2015) to establish a foundation of design thinking approaches in contemporary design discourse. The work of Salen and Zimmerman (2004) in *Rules of Play: Game Design Fundamentals* also provides insight on approaches to teaching design thinking methods to students of game design. Salen and Zimmerman's (2004) work is valuable to this study from a pedagogic perspective in particular, as it focuses on the design thinking process through an educational lens, while simultaneously being grounded in the domain of play theory. Since Brown's (2009) model for design thinking aligns closely with the widely adopted design thinking model championed by design innovation firm IDEO, their methods are grouped with his views on design thinking in this literature review. Lastly, among the multitudes of models and approaches that have emerged as a result of a 'boom' in popularity of design thinking – both as a commercial and general problem-solving strategy – the work of the Standford

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[15] Tim Brown is chair of IDEO and is an influential designer, innovator and speaker in the field of design thinking. Brown champions the potential of design thinking to spark innovation across business, healthcare, and educational sectors. One of Brown's seminal works, the book *Change by Design* (2009) was revised in 2019 and still serves as a valuable resource to understand the foundations of design thinking. Brown holds honorary doctorates from The Royal College of Art (London), Keio University (Tokyo), Claremont McKenna Graduate University (Los Angeles), and Art Center College of Art and Design (Los Angeles) and writes for publications such as The Economist and The Harvard Business Review (Tim Brown 2021).

[16] Kees Dorst was trained as an industrial designer at the Delft University of Technology and is a seminal researcher, educator and speaker on the topic of design thinking and innovation. Dorst is currently a Professor of Design Innovation at the University of Technology in Sydney. He has authored *Understanding Design: 175 Reflections on Being a Designer* (2007), and co-authored *Design Expertise* (Lawson & Dorst 2009) (Kees Dorst 2021). *Frame Innovation: Create New Thinking by Design* (2015) is Dorst's latest publication.

d.school[17] provides valuable insights on applying design thinking techniques in the context of education, despite their research being focused on K-12 education.

The potential that design thinking has to contribute to social innovation is largely attributed to its human-centred, flexible and iterative problem-solving approach to design. Focus is shifted in design thinking from the design of a polished artifact to the design of a movable, human-centred process that addresses particular needs; the designed process operates within a particular socio-economic and cultural, and political context. Although the firm IDEO did not invent the concept of design thinking, the company explains that they had followed human-centred approaches to design since their inception in 1978, and had taken up the phrase to "…describe the elements of practice [they] found most learnable and teachable – empathy, optimism, iteration, creative confidence, experimentation, and an embrace of ambiguity and failure" (IDEO Design Thinking: History 2020). As a mind-set and methodology, design thinking has seen roughly fifteen years of popular adoption, amongst a growing number of industries. However, the methodologies are not always applied uniformly, nor with a consistent amount of depth and rigour. In addition, it has become easy to use the term as a sort of currency, without commitment to understanding and applying the practice in full (IDEO Design Thinking: History 2020).

Tim Brown, chair of IDEO, unpacked principles of design thinking and its application to innovation to popular acclaim in his book *Change by Design* (2009). Contributing to the critical discussion around design thinking methods, Lucy Kimbell published two articles, titled *Rethinking Design Thinking* (Part 1 and Part 2) (2011), that pose questions about the adoption of design thinking principles by management educators and consultancies. Kimbell (2011:285-286) raises three issues that she argues "undermine[s] the claims made for design thinking":

- Accounts of design thinking often "rely on a dualism of thinking and knowing, and acting in the world".
- Generalised theories of design thinking tend to ignore the diversity of "designers' practices and institutions, which are historically situated".

[17] The Stanford d.school falls under the Hasso Plattner Institute of Design at Stanford University. The d.school was founded in 2015 by Stanford professors, with David Kelly (an engineering professor and founder of IDEO) among them (David Kelly 2021). The d.school has grown to include more than 100 professors and visiting instructors teaching classes annually. The d.school also offers design thinking and innovation resources and workshops for K-12 teachers, students and university lecturers (Gardener 2017).

- Designers are placed in the centre of the design process as "the main agent in designing".

As a counter to these issues, Kimbell (2011:286) argues that "… the situated, embodied routines of designers and others offers a useful way to rethink design thinking". This sentiment is in line with Jacques Lange's (2011:92) commentary in the Icograda *Design Education Manifesto*, with specific reference to design education in South Africa. Lange (2011:92) argues that homogenised cultural perspectives and singular approaches to design problems are problematic, particularly within the African, and South African context. It is necessary to note that localised practices, contexts and ways of working need to inform design thinking methodology; design processes can be informed by universal best practice, but should not be applied in a formulaic manner. This highlights the need for empathy as part of the design process. Empathy, although usually included as an initial step in the process, as a means to metaphorically 'step into the shoes' of the humans for which you are designing, is explained and applied very differently in various design thinking models. However, there seems to be consensus amongst design thinking theorists that design should be primarily human-centred in its approach to framing and attempting to solve complex problems.

It is useful here to give a brief overview of the design thinking sources consulted for the purposes of this literature review, as substantiated in the introduction to this section. In Table 2, the perspective and focus of each design thinking theorist or school is summarised; and the way in which design thinking has been framed, as well as the methods outlined for a design thinking process, are shown in brief. Finally, the application of the design thinking theory is shown, to illustrate how the theory could be useful to this literature review, falling within the domain of design higher education.

Both IDEO and the Stanford d.school follow a pragmatic approach to design thinking theory, where the d.school has an additional pedagogic focus in many of their methods and applications[18]. The education-focused approach taken by the d.school is in line with their philosophy that design thinking should be democratised and made accessible to students and educators from a wide range of disciplines.

[18] The Stanford d.school also provides lesson plans, workbooks and courses for educators that follow design thinking principles. These resources are accessible via their website (Stanford d.school 2021).

	Tim Brown (2009)/ IDEO (2021)	Kees Dorst (2015)	Stanford d.School (2021)	Salen & Zimmerman (2004)
Perspective	Pragmatic	Theoretical Philosophical	Pragmatic Pedagogic	Theoretical Pedagogic
Focus	Design thinking and innovation; harnessing design thinking tools and problem solving strategies for a broad range of industries	Alternative approach to commercial design thinking strategies. Presents a theory of "design abduction," where the unknowns of a problem situation are explored creatively in search of a solution.	Educational resources and programmes to foster creativity, build complex problem solving skills and nurture a shared skills network.	Written for game design educators and students of game design. A human-cented and context-specific approach of designing "meaningful play" is outlined.
How design thinking is framed	It is a human-centred approach to problem solving and thinking that is iterative and non-linear (Brown 2009:212).	Focus in design thinking shifts from defining problems to "framing" them in the context of the desired outcome instead (Dorst 2015:53).	Design and design thinking (or creative thinking) should be democratised and made easily accessible to those outside of the design discourse.	A framework made up rules, play and culture is used to "facilitate critical design thinking." This framework is presented as a model for designing "meaningful play experiences". (Salen & Zimmerman 2004:26).
Design thinking process / method	Inspiration > Ideation > Implementation	Formulating > Representing > Moving > Evaluating > Managing	Navigate ambiguity > Learn from others > Synthesise information > Experiment rapidly > Move between concrete and abstract > Build and craft > Communicate > Design your work	Game creation > Game modification > Game analysis
Application	Innovative thinking approaches in business, education, health sciences	Innovation in complex problem solving across a wide range of industries and applications	Innovative thinking in the education sector and those interested in learning about design thinking methods	Critical design thinking for students of game design and design educators

Table 2: Design thinking theory: overview
(Brown 2009; IDEO 2021; Dorst 2015; Stanford d.school 2021; Salen & Zimmerman 2004).

From a method-focused perspective, the Design Thinking Process Diagram (Figure 3) by the d.school is most comprehensive in naming the main steps in the design thinking process. A modular, hexagonal representation in the model indicates that steps are movable and flexible. One could, for example, empathise, test or ideate multiple times and even in differing orders depending on the project context and application of the design solution. However, in a typical scenario, the process would be followed from beginning to end at least once, with iterations happening more likely as to-and-fro movements between individual steps. Most notable features of the d.school model are its emphasis on 'empathising' with the human beings for whom you are designing (mostly by means of

conducting interviews with a focus on recognising emotions and identifying stories in relation to the theme) and the emphasis on assessing the project. The final step, to assess, goes further than simply product testing, where critical reflection and evaluation can provide opportunities to build feedback into future iterations, or to improve future design processes.

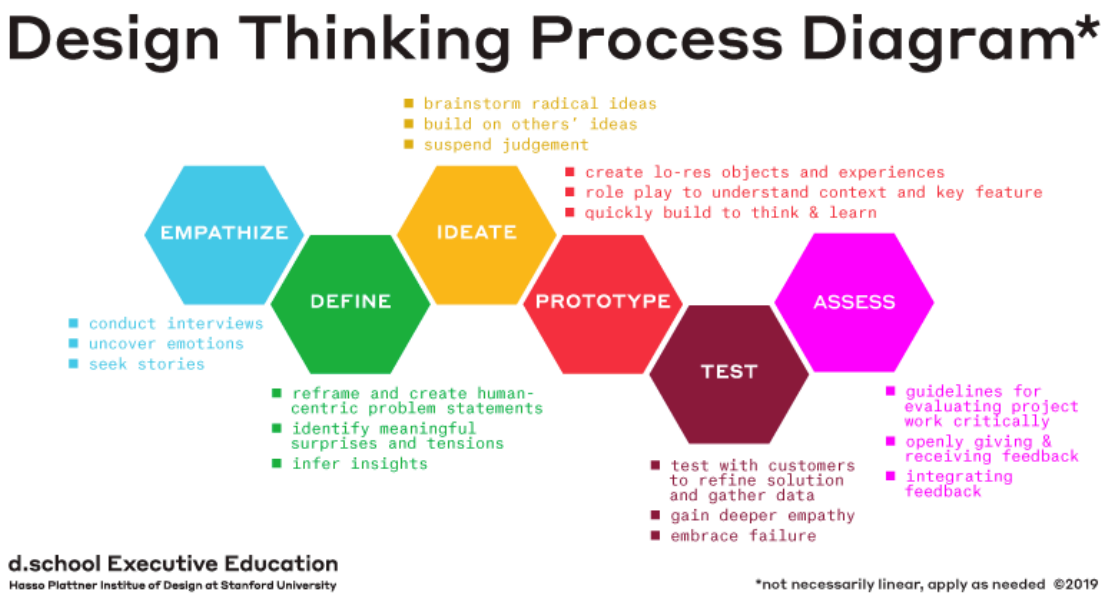

Figure 3: Design Thinking Process Diagram, Stanford d.school (Hasso Plattner Institute of Design at Stanford University in Balcaitis 2019).

As co-founder of IDEO, Tim Brown's (2009) approach to design thinking, as outlined in *Change by Design* (2009) informs much of IDEO's (2021) current approaches to design thinking as well. Brown (2009), IDEO (2021) and the d.school (2021) emphasise that the design thinking process is iterative and non-linear. IDEO (2021) proposes that design thinking happens at the intersection of what is desirable from a human point of view, with what is economically viable and technologically feasible. IDEO (2021) also explains that modes of thinking in design thinking oscillate between divergent and convergent thinking (as is evident in Figure 4) (IDEO Design Thinking 2020). In simplified terms, divergent thinking refers to "creating choices", where convergent thinking shifts focus to "making choices" (IDEO Design Thinking 2020). This move between divergent and convergent modes of thinking is also illustrated in Figure 2, in the previous section, to show how students of Information Design oscillate between different modes of thinking as they move through the design process. In an educational approach, this thinking strategy is useful in helping students to meet their deadlines and plan their time. For example, too much

emphasis on ideation with too little emphasis on narrowing down options might result in slow progress and frustration for students and facilitators.

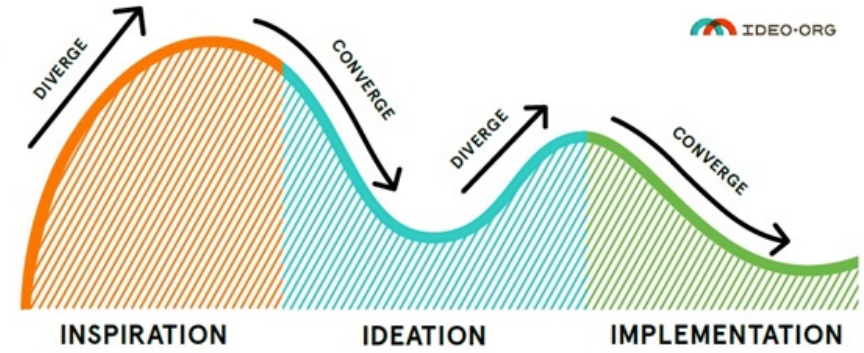

Figure 4: IDEO Design Process (IDEO in Balcaitis 2019).

In contrast to Brown (2009), IDEO (2021) and the Stanford d.school's more pragmatic approaches to design thinking, Dorst (2015) places greater focus on the notion of "design abduction" as a mode of reasoning as opposed to outlining step-by-step models as an approach to design thinking. Sharing many of the core characteristics of design thinking – like its human-centred, non-linear approach and its emphasis on problem-solving – Dorst (2015) provides additional insight into what constitutes "complex problems" and uses this as a departure point to understand the strength of "design abduction" in framing such problems. According to Dorst (2015:1), such complex problems are "so open, dynamic and networked that they seem impervious to solution".

In the foreword to his book *Frame Innovation* (2015), Dorst (2015:[sa]) defines design "as a service through rigorous creativity, critical enquiry, and an ethics of respectful design". He continues that design "rests on a sense of understanding, empathy and appreciation for people, for nature, and for the world we shape through design" (Dorst 2015:60). As such, Dorst's (2015) framing of design is in keeping with both Resnick (2016) and Shea's (2012) positions that designers can, and should, participate in shaping their communities and environments through their work.

The purpose of surveying theory on design thinking and applications, in pragmatic, theoretical and pedagogic instances, is not to align with a specific model or series of steps that could be applied 'as is' in the case study section of this research. Rather, the intention is to understand how the notion of design thinking has been adopted as a mode of thinking

– a mode of thinking that is no longer perhaps as 'new' and 'innovative' as its commercial adopters may claim. The value of having a foundational understanding of design thinking methodologies, therefore, is to situate the design process of the students, when analysed as part of the case studies, within a body of theory that is widely accepted in design practice. By drawing from existing terminology widely adopted within the design thinking school of thought, student process that are unique to the case studies of this research could be described in a way that makes this research accessible to a wider audience, thus strengthening its contribution within the domain of design higher education research. Viewing student design processes in this way, through a design thinking lens, but with a focus on understanding individual circumstances, contexts and ways of working, addresses Kimbell's (2011:286) concern, as mentioned previously, that generalised theories of design thinking tend to take a homogenised view of the design process. Instead of this, the research conducted in this study aligns with Kimbell's (2011:286) suggestion that the "situated, embodied routines of designers and others offer a useful way to rethink design thinking". That is to say, a descriptive and exploratory view of student design processes (gathered from empirical data[19] collected in the case studies) will not ignore what Kimbell (2011:286) describes as the diversity inherently present in "designers' practices and institutions, which are historically situated".

To synthesise these different approaches to **design thinking**, a working definition of the term for the purposes of this study is as follows:

DESIGN THINKING

Design thinking is an approach to design that is human-centered, focused on solving complex problems and driving innovation. The process followed in design thinking is collaborative, iterative and must function within the culture and context of both the designer(s) and the stakeholders involved in the design process. Design thinking places emphasis on action-based learning, where rapid prototyping, failure and experimentation play an integral role in the process.

[19] The student design processes are documented in the process workbooks of students (both from 2019 and 2020). Classroom observations (for the 2019 cohort of students) and the transcriptions from consultations with students (in 2020) also provide empirical data to enable an exploration and description of the design process followed by students for both case studies.

2.5 Design Thinking in contemporary design education

Owing to the potential for design thinking strategies to promote innovation and encourage creative thinking, there have been attempts to integrate the methodology in higher education contexts. In an article titled, *Can Design Thinking Redesign Higher Ed?* (2017), Lee Gardener provides an account of a design thinking workshop held at the Stanford d.scool. During the workshop, 50 college professors and a reported were tasked with the challenge of "finding ways to encourage lifelong learning" (Gardener 2017:1). Although some ideas springing from the workshop are interesting, post-workshop critiques by professors, interviewed by Gardener (2017:4-5) provide insights into common scepticisms or concerns regarding the integration of design thinking methodologies in higher education. A positive aspect of design thinking, according to Wasko (in Gardener 2017:4), is the potential for innovation to become "a repeatable process that can be learned and applied". Wible (in Gardener 2017:4) notes that professors often lose sight of the "needs of the users" (the students) when developing course work or structuring lectures. Design thinking methodologies could thus provide more inclusive tools to engage with students and better their learning experiences. However, Wible (in Gardener 2017:5) also notes that the focus of empathising with users only by means of interviews, as was done in the Stanford d.school workshop that Gardener (2017) discusses, leads to macro-level insights that leaves "larger societal problems" unaddressed when tackling complex problems. Similarly, Collier (in Gardener 2017:5) voices her concern about the "design thinking methodology favouring solutionism rather than engagement with complex problems and looking for root causes and systemic issues". These insights suggest that design thinking methodologies need to be applied critically, not in a formulaic manner, but in a way that considers the wider context in which design solutions operate. As stated by Cavagnaro (in Gardener 2017:5), understanding a design thinking methodology as a tool to foster abilities (such as navigating ambiguity and cultivating a learning mind-set), rather than seeing it as a series of steps, is helpful in understanding the value that these methodologies could bring to higher education.

Amongst the terms often included in design thinking methodologies, terms like "users", "co-design", "design-led research" and "participatory design" are used frequently but can remain ambiguous. The purpose of this section of the literature review is to discuss the position of the designer in relation to the end user, by referring to Sander's (2008) map of design research. Furthermore, including insights on probing, from the work of Daria Loi

(2005, 2007), help to describe tools that are useful in design research and development. Although written from an anthropological lens, the probing tools described by Loi (2007) are applied in the context of design research and are closely aligned with processes followed by students of Information Design while completing their design research processes in the case studies.

Sanders (2008) writes from a design research lens and developed what she refers to as "an evolving map of design research" to plot various approaches that are used simultaneously in the field of design research and development. Although this map was conceptualised in 2008, the delineation of approaches provides a relevant point of discussion, particularly when aiming to understand how a particular design research process is undertaken. Sanders' (2008:14) design research map consists of "two intersecting dimensions", defined by approach and by mind-set respectively. With regard to approach, a research-led and design-led approach to research lie on opposing sides of the vertical axis. On the horizontal axis, "a culture characterised by an expert mind-set" falls on the left-hand side, where the right-hand side represents a "culture characterised by a participatory mind-set" (Sanders 2008:13). When the designer is positioned as the "expert" in the design research process, the aim is to design primary *for* people – the people being designed for are often referred to as "users", "consumers" or "subjects" (Sanders 2008:13). In participatory design, the designer aims to design *with* people, considering the people themselves experts in their own lived experiences. Adopting a participatory mind-set, according to Sanders (2008:13), means that design researchers "value people as co-creators in the design process". Figure 5 shows the "underlying dimensions" in Sanders' (2008:14) map. Here, four quadrants exist between the vertical (approach) and horizontal (mind-set) axes.

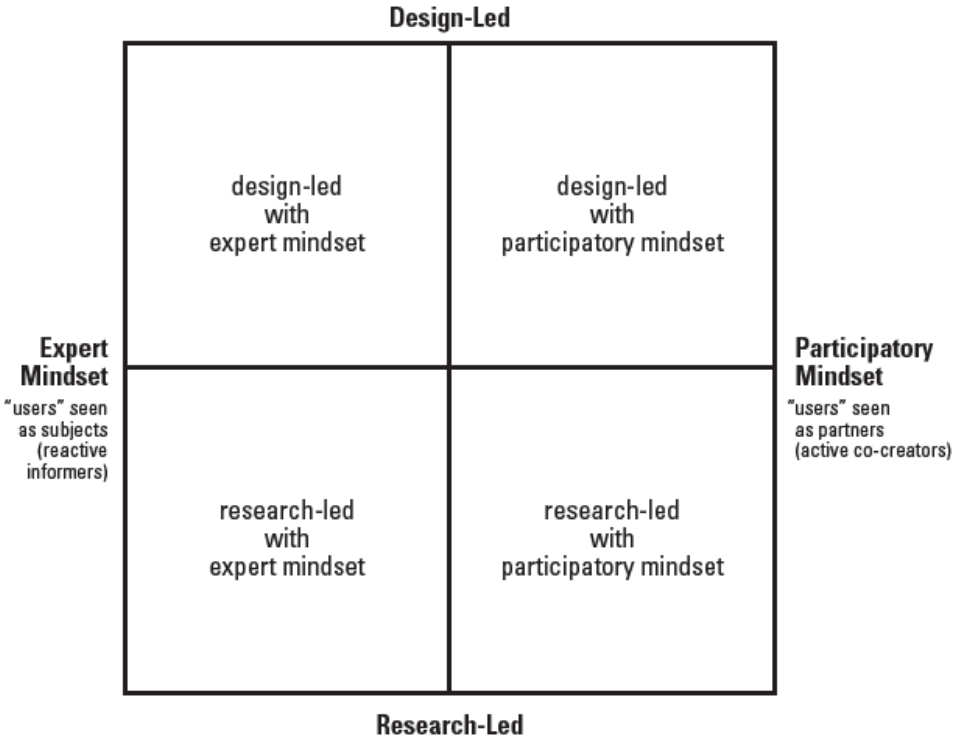

Figure 5: Sanders' map of design research – Underlying dimensions (Sanders 2008:14)

Sanders (2008:14) continues to develop her "evolving map of design research" based on this framework, by plotting various approaches in design research around these four quadrants (as seen in Figure 6). In Figure 6, it becomes clear that the "user-centred design zone" is the most developed area on the map. Here, "user-centred design" makes use of research-led approaches, following an expert mind-set to "collect, analyse and interpret data" that can inform design development (Sanders 2008:14). In contrast to "user-centred" design, "participatory design attempts to involve those who will become the "users" throughout the design development process to the extent that this is possible" (Sanders 2008:14). Although this is unpacked in the case study section of this thesis, it is worth noting that the design research and development process followed by the Information Design students align most closely with a participatory design approach and would fall within the top-right quadrant of Sanders' (2008:14) model, following a design-led approach with a participatory mind-set.

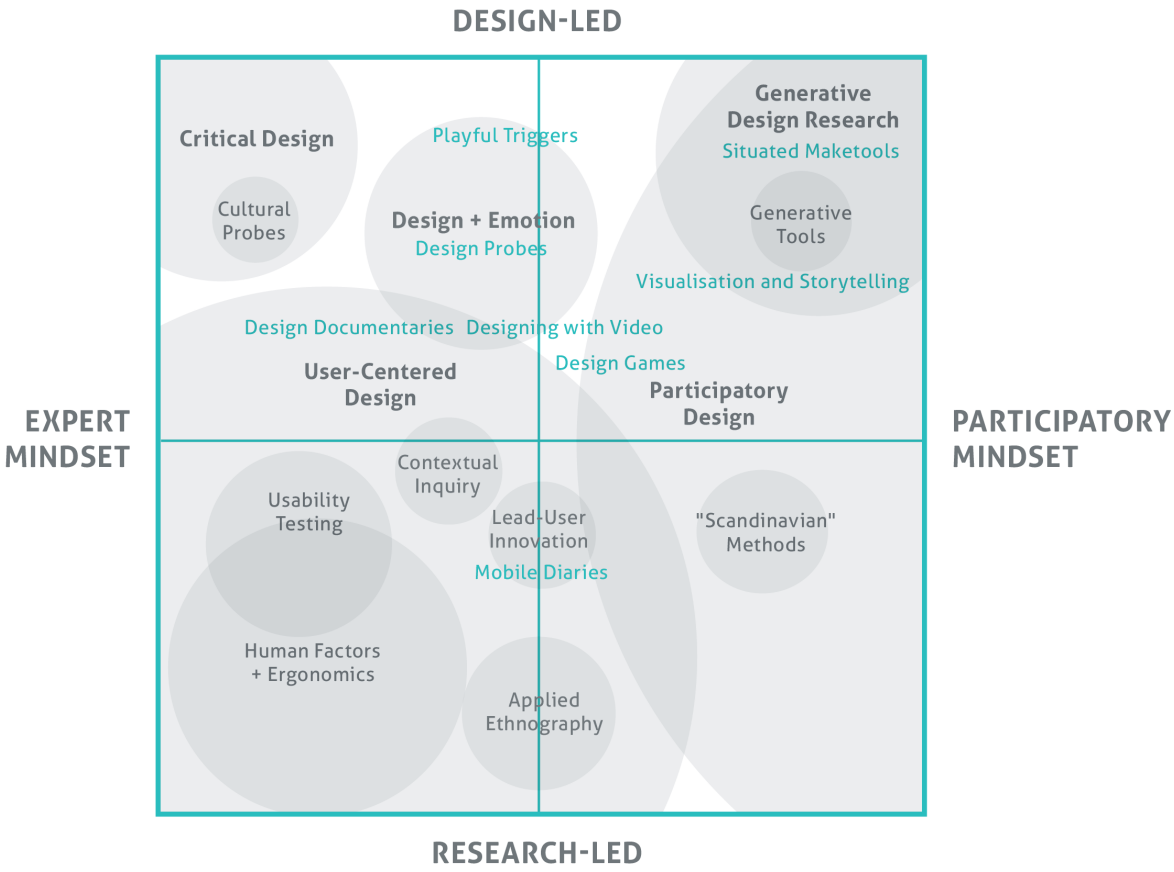

Figure 6: Sanders' Map of design research - New tools and methods (2018:17)

The map shown in Figure 6 includes emerging tools and methods in design research (Sanders 2008:17). It is included here because of its reference to "playful triggers", a kind of probe that can be used to gather insights or data during design research and development, based on the concept of cultural probes (Loi 2007:232). Cultural probes are an ethnographic tool that can be used to gather insights or data during a research process. Loi (2007:233-234) provides four ways in which cultural probes can be useful in a research process, namely: to generate inspirational data, to gather relevant information, to gather empathetic data and to be used as a tool to develop and understand new technologies. Written from an anthropological lens, Loi (2007:232) discusses various probes derivative of cultural probes. In particular, Loi's (2007:235) explanation of reflective probes and playful triggers are beneficial to the case studies, as students in both case studies were engaged in similar processes. Insights on reflective probes and playful triggers are summarised briefly as follows (Loi 2007:235):

- **Reflective probes** (Loi 2007:235) serve to create "conditions for reflective practice[20]" by making use of activities that include "creative, ambiguous and inspiring artifacts". One reason to encourage reflective practice is to establish a routine, or habit, of looking back on and examining one's experiences (Schön 2017). According to Loi (2007:236), examining one's experiences aids perspective taking. It is important that reflective probes are kept contextual and developed for their specific circumstance (Loi 2007:236).
- **Playful triggers** (Loi 2007:237) aid in encouraging and improving reflective engagement, communication and collaboration. Loi (2007:237) explains that a playful trigger can "rekindle the possibility for people to play, wonder and learn and to discover (or rediscover) the pleasure and benefits of such experiences". The excerpt below from Loi (2007:237) is included as it clearly articulates the sentiment behind playful triggers – as something that is an active experience, is fluid in its application and relies a sensory, as opposed to purely logical or analytical, approach to looking and learning:

> Playful triggers aim at activating receptive modes of engagement[21], favouring sensory over formal attributes of engagement. These tools generate receptive modes through their tactile, visual, mysterious, playful, tridimensional, poetic, ambiguous and metaphorical qualities and asks people to challenge taken for granted or conventional ways of doing, seeing and articulating things to co-generate shared understandings and collaborative practices. Playful triggers should be designed according to four key notions: wonderment, playfulness, learning through making and metaphors. I based these tools on the idea that to make is to learn, to make requires playfulness, and to play is to learn. Learning occurs in the making of things and is an active experience which helps create and share new meaning – a knowledge-by-encounter that is intuitive and holistic. Playful triggers facilitate people to make via playing with artifacts that make them wonder.

The section on play that follows in this literature review builds on Loi's (2007:238) argument that playful triggers can "co-generate shared understandings and collaborative practices" by challenging conventional ways of reasoning. The idea that playful triggers could spark engagement, as well as encourage collaboration and communication, aligns closely to what was observed during the case studies in the Design for Development projects of 2019 and

[20] Loi bases these "conditions for reflective practice" on the work on Donald Schön (1983).
[21] Loi (2007:237) references Deikman (1973) theories on "receptive modes of engagement" versus "active modes of engagement". Where active modes are "verbal, analytical, sequential and logical", receptive modes are "nonverbal, holistic, non-linear and intuitive".

2020. Although this is unpacked in more detail in Chapter Five, it is possible that introducing play in the design process contributed to some of the outcomes of playful triggers described by Lois (2007:237). Most notably, these are that: playful triggers could help to provide a nuanced reading of a specific context that more conventional, analytical approaches might have been unable to provide; that playful triggers could deepen data gathered by being applied in a specific context and with a specific group of people; and lastly that playful triggers could encourage collaborative practices and dialogue between players in a research context.

2.6 Understanding play

The benefits of play for children (both in the act of playing and in the integration of play with learning activities – playful learning) have been widely cited. In *A World without play: A literature review*, Josie Gleave and Issy Cole-Hamilton (2012) investigate the potential effects that a lack of play, particularly physical play, can have amongst children in the United Kingdom. In their review, Gleave and Cole-Hamilton (2012:3) argue that play, in particular outdoor play, is important for children to increase levels of physical activity, and that play can positively influence well-being and social and emotional development. Furthermore, the importance of community play is highlighted for both children and adults (Gleave & Cole-Hamilton 2012:3). The authors affirm that adults and communities can create space for play in its different forms to encourage the quality and regularity of play in children. In the context of design higher education, Ham (2016:20) argues that the play concept is often overlooked as a "core activity" in design, but offers the counter that "play exists in design and becomes critical to being creative". Writing on the topic of integrating play in the context of higher education more broadly, James (2019:14) highlights the challenge in addressing misconceptions held of play, especially among critics who doubt its credibility in a 'serious' academic environments. James (2019:14) states that there is a need to persuade those reluctant to delving deeper into play, "that [play] brings something significant to study and exploration of deep and complex subjects at an advanced level." Furthermore, Rice's (2009:97) research on the role of playful learning approaches in Architecture higher education highlights the power of play to enrich learning by providing experiential, immersive learning experiences. Rice's (2009:103) observation that "the deliberate blurring of play and work enabled students to become aware of their relationship to the emerging knowledge" is aligned with Gray's (2013:154) argument that the fun, immersive nature of play contributes to its potential as a meaningful tool for learning.

Play is a complex and ubiquitous activity and, although some theorists have been written about integrating play in university contexts (Gielen 2009; Rice 2009; Ham 2016; Arnab, Morini & Clarke 2018; Tanis 2012; James & Nerantzi 2019) play is most often investigated and understood as belonging to the world of children. Seminal play theorist Brian Sutton Smith argues in *The Ambiguity of Play* (1997:225) that the ambiguities surrounding play are

> particularly problematic in Western society, where play is seen largely as what children do; why children play but adults only recreate; why play is said to be important for children's growth but is merely a diversion for adults.

Other seminal theorists on play (Callois 1958; Sutton-Smith 1997; Salen & Zimmerman 2004; Gray 2013; Sicart 2014) agree that it is difficult to arrive at a singular definition of play. For example, the work of Peter Gray, developmental psychologist and researcher on the benefits of play, is particularly beneficial to this study as Gray[22] defines play with regard to motivation and process. Gray (2013:137) argues that one of the benefits of play is that it "provides a state of mind that, in adults as well as children, is uniquely suited to high-level reasoning, insightful problem solving, and all sorts of creative endeavours". In an attempt to arrive at a working definition of play, and to form a theoretical framework of play for the purposes of this study, Table 4 summarises definitions and characteristics of play based on the differing perspectives of key texts on play. This summary includes perspectives on play from: The Lego Foundation (2019); Miguel Sicart (2014); Peter Gray (2013); Aistear (2009); Katy Salen and Eric Zimmerman (2014); Brian Sutton-Smith (1997); Roger Callois (1958) and Johan Huizinga (1938). Rather than providing an in-depth account on theories of play as presented by each of these authors or organisations, this section considers overlapping themes with regard to the definition of play, and more specifically themes relevant to understanding how play could be framed in the context of design higher education.

The first point is the matter of how to decide whether or not an activity is, or isn't, play. On this topic, Gray (2013:137) explains that, rather than overt behaviour, the motivation behind play is a key driver in determining whether an activity is play or not. As such, the same activity may be viewed differently by two people who complete it, depending on their motivation in completing the activity and their enjoyment while completing it. According to Gray (2013:137), one would "infer from their expressions and the details of their actions"

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[22] Peter Gray is a research professor at Boston College and the author of *Free to Learn* (2013) and university textbook *Phycology* (1998). His research areas span neuroendocrinology, developmental psychology, anthropology, and education, but his current focus is children's natural ways of learning and the value of play (About Peter Gray Ph.D 2021).

their attitude toward completing the activity. Building on this point, is the idea that play can exist on a continuum – Gray (2013:139) asserts that "play is not necessarily all-or-none". Looking at adult play, Gray (2008) argues that "play is commonly blended with other motives, having to do with adult responsibilities". This is not to say, however, that an activity cannot be defined as play if it is not "pure" play in the way we often see children playing. Because an activity can be more or less playful – something that can "vary by degrees" – Gray (2013:139) explains that thinking of play as the adjective, *playful*, can sometimes provide a more useful understanding than the noun *play*, which implies that something is, or isn't, play.

This leads to discussion of the second point, which is that, in theorising play, it is necessary to understand the difference between *play* and *playfulness*, particularly in the context of how the terms are used in this study. As Sicart (2014:21) explains,

> [p]layfulness is a physical, psychological and emotional attitude towards things, people and situations. It is a way of engaging with the world derived from our capacity to play but lacking some of the characteristics of play. Intuitively, we can feel the difference between play and playfulness. We can also have the vague idea that we can be playful even when playing.

According to Sicart (2014:22) play is therefore an activity, whereas playfulness is an attitude. Thus, it is also possible for a playful attitude to exist both while actively in a state of play, and when technically "out" of a state of play. As Sicart (2014:22) also clarifies, playfulness projects some "characteristics of play into non-play activities". It is possible to be simultaneously playful and at play.

Katie Salen and Eric Zimmerman (2003) provide a more "design-centric" clarification of their understanding of play and playfulness in their book, *Rules of Play*, a resource for understanding games and game design. As is shown in Figure 7, Salen and Zimmerman (2003:531) describe three categories of play, becoming "successively more open and inclusive" from the centre of the model. The innermost circle, game play, is "a formalised interaction that occurs when players follow the rules of a game and experience its system through play". A slightly broader category, ludic activities are activities "relating to play" and are not confined only to the playing of formalised "games". Lastly, the broadest category, being playful, "refers not only to typical play activities, but also to the idea of being in a playful state of mind, where a spirit of play is injected into some or other action" (Salen & Zimmerman 2003:532).

Figure 7: Categories of play (Salen & Zimmerman 2003).

Salen and Zimmerman's (2003) categories of play are useful in their implication that play is not fixed. Play can take on different forms during its course and also mean different things for various players engaging in play, even when playing at the same time.

The third point that comes up in theory and definitions on play (Gray 2013; Huizinga 1938) is a paradox that exists at the heart of the play concept. Play is simultaneously serious and non-serious. Cultural historian Johan Huizinga (1938:13) elaborates on this idea in his seminal book *Homo Ludens* (1938) when he explains that play exists outside of the "serious" reality of ordinary life (and is thus "not-serious"), but that it is completely immersive in the play experience (and can therefore be very serious). Huizinga (1938:1) also argues that there is something "at play" while playing that "transcends the immediate needs of life and imparts meaning to the action" – thus, according to Huizinga, all play is meaningful. Gray (2013) sums up the notion of paradox in play when he argues that the key to understanding the educative potential of play is the fact that play is "trivial" (non-serious, or play for play's sake), yet precisely because of its "fun" nature, play is an immensely powerful and "serious" tool for education. As Gray (2013:154) emphasises, learning through play happens as a by-product, but children at play do not feel under pressure to learn and are more engrossed in the process of learning as a result – this allows for deeper learning to take place.

Play theorist Brian Sutton-Smith's (1997) seven rhetorics of play have become a seminal model in understanding drivers behind different kinds of play. Table 3 provides a summary of these seven rhetorics of play: play as progress; play as fate; play as power; play as identity; play as imaginary; play as self and play as frivolity. In any particular playful event or activity, one or many of these different kinds of play could exist simultaneously. For

example, when engaged in imaginary play, like dressing up, small children might engage in play as progress, practicing fine-motor skills as they learn to unfasten buttons or close zippers, and at the same time express a sense of identity in the characters they become (play as identity). Thus, play becomes more layered and complex and can be combined in different ways for enjoyment, learning and connection.

THE SEVEN RHETORICS OF PLAY (SUTTON-SMITH 1997)

RHETORIC	HISTORY	FUNCTION	FORM	PLAYERS	DISCIPLINE	SCHOLARS
PROGRESS	Enlightenment, evolution	Adaptation, growth, socialization	Play, games	Juveniles	Biology, psychology, education	Vygotsky, Erikson, Piaget, Berlyne
FATE	Animism, divination	Magic, luck	Chance	Gamblers	Math	Bergler, Fuller, Abt
POWER	Politics, war	Status, vitcory	Skill, strategy, deep play	Athletes	Sociology, history	Spariosu, Huizinga, Scott, Von Neumann
IDENTITY	Tradition	Communitas, cooperation	Festivals, parades, parties, new games	Folk	Anthropology, folklore	Turner, Falassi, De Koven, Abrahams
IMAGINARY	Romanticism	Creativity, flexibility	Fantasy, tropes	Actors	Art and literature	Bakhtin, Fagen, Bateson
SELF	Individualism	Peak experience	Leisure, solitary, extreme games	Avante-garde, solitary players	Psychiatry	Csikzentmihalyi
FRIVOLITY	Work ethic	Inversion, playfulness	Nonsense	Tricksters, comedians, jesters	Pop culture	Westford, Stewart, Cox

Table 3: Brian Sutton-Smith's Seven Rhetorics of Play (1997)

2.6.1 Towards a working definition of play

The definitions and characteristics outlined by key theorists on play from a range of theoretic perspectives have been summarised in Table 4. The aim of presenting this summary is to identify overlapping themes in these definitions, in order to arrive at a working definition of play in the context of design higher education.

	Lego Foundation (2019)	Sicart (2014)	Gray (2013)	Aistear (2009)
Theoretical perspective	Early learning	Game and play theory	Childhood development Education	Early learning Curriculum development
How play is defined/ characterised	**Characteristics of playful experiences:** Joyful Socially interactive Actively engaging Meaningful Iterative	**Play is:** Contextual Carnivalesque Appropriative Disruptive Autotelic Creative Personal	**Characteristics of play:** Self-chosen and directed Means more important than ends Guided by mental rules Imaginative Requires an active, alert, non-stressed frame of mind	**Characteristics of play:** Active Adventurous and risky Communicative Enjoyable Involved Meaningful Sociable and interactive Symbolic Therapeutic Voluntary
	Salen & Zimmerman (2004)	**Sutton-Smith (1997)**	**Callois (1958)**	**Huizinga (1938)**
Theoretic perspective	Game and play theory	Rhetorical framing of play	Sociology of play and games	Anthropology and play in culture
How play is defined/ characterised	**Meaningful play is:** Discernable Integrated	**Rhetorics of play:** Play as progress Play as fate Play as power Play as identity Play as imaginary Play as rhetoric of the self Play as frivolous	**Play is:** Free Separate Uncertain Unproductive Governed by rules Make-believe	**Play is:** Free Non-serious yet immersive Not engaged in for profit or material gain Governed by its own boundaries of space, time and rules Social and encourages the formation of groups when players join in the "circle of play"

Table 4: Definitions and characteristics of play

Based on the summary of characteristics and definitions of play shown in Table 4 (Lego Foundation 2019; Sicart 2014; Gray 2013; Aistear 2009; Salen & Zimmerman 2004; Sutton-Smith 1997; Callois 1958; Huizinga 1938), certain characteristics of play have been grouped into themes based on the way that these characteristics intersect with design higher education. These themes are discussed in aid of arriving at a working definition of play and each of the ten themes is discussed below. In brief, these themes assert that play: is free; exists in its own realm; is governed by rules; is joyful; is iterative; is meaningful; is process-oriented, is socially interactive, is immersive, and that play is intuitive.

2.6.1.1 Play is free

Huizinga (1938:7) mentions the voluntary nature of play as the first point in its definition. Callois (1958:6) echoes Huizinga's (1938:7) statement when he argues that, as soon as play becomes formulaic or prescriptive, or controlled by an adult, it is no longer enjoyable and the play element disappears. Gray (2013:141) also emphasises the presence of freedom in play. However, Gray (2013:141) frames this idea of freedom slightly differently when he argues that, for an activity to be understood as play, the player must want to engage in the activity and freely choose to participate. Even when play forms a part of work, as it might in adult play in particular, Gray (2013:142) explains that a sense of freedom in completing a task, as well as the *choice* to engage, contributes to making an activity more or less playful. For the purposes of this study, therefore, *freedom in play* is interpreted in line with Gray's (2013) view that a player must freely *choose* to participate in a play activity in order for it to be considered play. Furthermore, this view takes into account Gray's (2013:139) argument, mentioned earlier in this section, that play can exist on a continuum. As such, the position is taken in this study that play can be prompted – as in the form of "playful triggers" (Lois 2007:237) – or play activities can be suggested to students. These prompts do not take away from the free nature of play when students choose to engage with the play and interact with activities in open and non-directed ways.

2.6.1.2 Play exists in its own realm

Huizinga (1938:12) is known in play theory for conceptualising the idea of the "magic circle", a device used to illustrate the fact that play exists in a realm removed from "ordinary" life or reality. Huizinga (1938:12) explains that "inside the circle of the game the laws and customs of ordinary life no longer count". Callois (1958:6) argues that "play is essentially a separate occupation, carefully isolated from the rest of life, and generally is engaged in with precise limits of time and space". Here, Callois' (1958) definition reflects Huizinga's (1938) argument that play exists in its own realm and also that play is delineated within particular parameters of time and space. Therefore, play has a particular "start" and "end" point. Interpreting play as an "imaginative" state of mind, Gray (2013:149) also asserts that play is "serious yet not serious, real yet not real". Once again, this paradox has to do with the idea that play takes place in the 'real' world, making use of real objects and even real subject matter, "yet in some way is mentally removed from the real world" (Gray 2013:149). Gray (2013:150) mentions that players have the ability to choose to step into – or out of – play, with moments of "time-in" (a period of fiction, in the mental world of play) and

"time-out" (temporary breaks to engage with reality). The role of imagination in play, according to Gray (2013:151) is also to move players along towards an imagined reality that does not yet exist. As such, according to Gray (2013:151), play is a "state of mind that promotes imagination" and allows hypothetical thought and creativity to flourish. Aistear's (2009:1) *Early Childhood Curriculum Framework* approaches the imaginative nature of play by characterising play as "symbolic". This form of imaginary, or pretend, play is powerful for children as it allows them to "try out ideas, feelings and roles" within the world of play. In addition, the "safe" or "separate" world of play means that play has therapeutic potential, as "play helps children to express and work through emotions and experiences" (Aistear 2009:1).

2.6.1.3 Play is governed by rules

Callois (1958), Sutton-Smith (1997) and Salen and Zimmerman (2007) argue, like Gray (2013:147), that rules are an integral part of play. Rules in play provide structure and an increased sense of enjoyment – players can structure the rules themselves or agree to accept the rules as they have been determined. However, all players in the game ascribe to, and accept, the same set of rules in order for play to continue. Gray (2013:149) notes that the ability to quit a game or "step out" of play is an important characteristic of play. As such, the option to quit in play may make some rules more tolerable, and in so doing provide a 'safe' space to explore concepts and experiment in a zone removed from the 'real' world.

Rules could be a means of entry to play (who can play?), a guide on play processes (how do we play?) or something to be subverted (how could the rules be bent or broken?). Salen and Zimmerman (2003) argue that the "rules of play" are made up by the social and contextual structures surrounding it. Moreover, according to Salen and Zimmerman (2003), rules are what make "the free movement of play possible". This means that play "is an expression of the system, one that takes advantage of the space of possibility created from the system's structure" (Salen & Zimmerman 2003). The idea that structure and rules can create space for freedom, experimentation and fun, as part of a play process, bears much similarity to that of the design process. In a similar way, the structure of a brief, of a specific mode of working and a flexible approach to process, helps to set parameters for appropriateness, but also allows for deviation, ideation and fun. These similarities between the design process and play are summarised by Salen and Zimmerman's (2003) argument that "play exists *because* of more rigid structures, but also exists somehow in *opposition* to

them". Thus play, like design, can be employed as a form of critique, exploration and subversion of the status quo. Salen and Zimmerman (2003) mention another kind of play, "transformative play", that occurs as play "overflows and overwhelms the more rigid structure in which it is taking place, generating emergent, unpredictable results". An example that they provide is how playful slang might become an idiom, that is later formalised and placed in the dictionary, and thus becomes part of the cultural structure that it initially resisted (Salen & Zimmerman 2003). Mary Flanagan, in her book *Critical play: Radical game design* (2009) provides many examples of how play has been used as a mode of critique, including, amongst others, critiques of cultural norms or gender stereotypes, and how it often pushes against its own set of rules. It becomes apparent that part of the dynamism of play lies in its relation to rules and its acceptance or opposition to those rules.

2.6.1.4 Play is joyful

For Callois (1958:9) and Huizinga (1938:5), the joyfulness of play is related to its freedom – a player chooses to engage in play and participates in it as long as enjoyment is derived from it. The Lego Foundation (2019) discusses characteristics of playful experiences in relation to learning. Foremost, they argue that learning through play is possible when an activity is experienced as joyful. Here, the word "joyful" denotes fun, enjoyment and pleasure experienced while engaged in an activity, as well as a sense of pleasure and satisfaction that remains after the activity has been completed. Also, in the context of play in education, Gray (2013:153) stresses the fact that, even when learning takes place in education, the player plays for enjoyment and learning happens as a by-product of play.

2.6.1.5 Play is iterative

Gray (2013:154) argues that play is "trivial" (or fun), but not easy. In fact, overcoming challenges in play contributes to the joy of it. In addition, the fact that a lot of repetition takes place during play makes it well suited to the realm of learning and education (Gray 2013:155). Here, players choose to repeat tasks to better their skills, or tweak repetitions slightly to try new approaches. Thus, repetition in play is "not rote", but a form of creativity (Gray 2013:155). Similarly, the Lego Foundation (2019) notes that playful experiences are "iterative" – the notion of trying various possibilities, testing hypothesis and asking new questions during play contributes to its potential for learning. In the context of game design, Salen and Zimmerman (2004:32) describe "iterative design" as a "play-based design process". When engaged in an iterative design process during game development,

designers have the ability to “play test” their products – this is important because, as Salen and Zimmerman (2004:32) stress, “it is not possible to fully anticipate play in advance”. The fact that both the design process and the process of play is iterative alludes to its potential as a valuable addition in the design higher education classroom.

2.6.1.6 Play is meaningful

Aistear’s (2009:1) *Early Childhood Curriculum Framework* explains that “play helps children to build and extend their knowledge” – this understanding is processed in a way that makes sense to each child individually. Similarly, the Lego Foundation (2019) assert that playful experiences are “meaningful” in that children have the opportunity to relate new experiences to things that they already know. In forms of mimicry play, for example, children can re-enact scenes from daily life and make sense of them through play. In the context of game design, Salen and Zimmerman (2004:67) explain the concept of “meaningful play” as an evaluative tool to discern whether or not a game could be considered “a well-designed system of play”. To Salen and Zimmerman (2004:67) “meaningful play” is both “discernible” and “integrated” within the game system. In other words, for an action in a game to be “discernible”, a player must be able to see the results of an action that they take – it must be tangible and the meaning of the action taken must be clear. “Integration” of game events, on the other hand, refer to how actions and outcomes fit in within the larger game context. In other words, “integration” refers to the broader consequences of actions as they fit into the game system as a whole (Salen & Zimmerman 2004:70). As an evaluative mechanism for game design, the concept of “meaningful play” is useful in the context of design higher education, to gain a better understanding of the elements required to design appropriate play activities.

2.6.1.7 Play is process-oriented

Building on the notion that play is joyful, play is also focused primarily on the *process* of play rather than any outcome or material gain (Huizinga 1938; Callois 1958). Gray (2013:142) states that “play is an activity conducted for its own sake”. Here, Gray (2013:143) mentions an example of two students studying for a test: the least playful student would study only what was necessary to achieve the desired outcome, whereas the playful student would enjoy the process of learning, valuing the process of studying more than the outcome of the test. In other words, play is “intrinsically motivated”, rather than “extrinsically motivated” (Gray 2013:143). This understanding of play has the implication

that it is possible to “ruin play by focusing too strongly on rewards and outcomes” – the process should be enjoyable for its own sake and should be the primary focus of the activity (Gray 2013:145).

2.6.1.8 Play is socially interactive

Although play can be an individual activity, and individual play is necessary for children, play often happens alongside or with others (Aistear 2009:1). For Huizinga (1938:13), the social aspect of play becomes particularly evident in his description of the “magic circle” of play, where players are grouped together during play, often surrounded by an element of secrecy in an attempt to differentiate themselves from the “real” world. The Lego Foundation (2019) argues that the socially interactive characteristic of play allows children to communicate their thoughts, share their ideas and build relationships. In the classroom environment, the social element of play can help to deepen learning experiences (Lego Foundation 2019). When Lois (207:237) explains the application of “playful triggers”, he argues that including playful triggers in the design process can challenge people to question “conventional ways of doing” and to “co-generate shared understandings and collaborative practices”. The social aspect of play thus becomes significant in its potential for problem solving when included in the design process.

2.6.1.9 Play is immersive

When players are engaged in play, they are fully immersed in the activity. The Lego Foundation (2019) argues that playful activities must be “actively engaging”, which refers to “mental immersion and resistance to distraction” while in a state of play. The fact that play requires “conscious control of one’s behaviour”, according to Gray (2013:151) means that an “alert, active” state of mind is necessary when in a state of play. Yet, because the focus during play is primarily on the process rather than the outcome, a player is not stressed while engaged in play – the “mind is not distracted by fear of failure” (Gray 2013:152). As Gray (2013:152) notes, this state of mind while playing is often referred to as “flow”.

2.6.1.10 Play is intuitive

When Huizinga (1938:1) introduces the idea that play is a “*significant* function”, he argues that play has existed since the beginning of time, and that man does not need to be taught how to play – it is thus a function that comes naturally. However, although play is intuitive and is not taught to infants or children, all play has meaning. While discussing concepts of

game design, Salen and Zimmerman (2004:559) explain that certain game mechanics also become intuitively entrenched in play (like the operation of a joystick or the repetition of a certain action in a game), which aids the flow of gameplay and aids in creating “meaningful play”. The fact that children play to mimic their world and surroundings, and use this as a means to make sense of their lived realities, attests to the intuitive nature of play.

Figure 8: Synthesis of theory to arrive at a working definition of play

A visual representation of the themes discussed to arrive at a working definition of play is shown in Figure 8. In closing, a summarised working definition of play in the context of design higher education, as applied in this study, is outlined as follows:

PLAY

Play is free in that players choose to participate and accept the rules of a particular instance of play. Thus, play is also governed by rules that all players adhere to. Play exists in its own realm, is imaginative and is seperate from the “real” world. Players may choose to step in and out of the play world while engaged in play. Play is joyful, fun and engaged in purely for the sake of play. Play is meaningful, in that it generates new meaning through engagement and interaction. Play champions process over outcome, is iterative and immersive; these qualities also contribute to its potential as a tool for learning. Play is socially interactive and allows for collaboration. Lastly, play is intuitive and does not need to be ‘taught’ - all people have the ability to play.

The aim of Chapter Two was to provide a conceptual framework for the three key areas that intersect in this study, namely, design higher education, the student design process and play. Developing a solid understanding of the theory related to the case(s) under observation in case study research, according to Yin (2018:41), is an important step to take towards refining the research design. In addition, a solid theoretical underpinning can aid as a "vehicle in generalising the findings from the case study" and is thus useful when analysing empirical data (Yin 2018:41). When conducting case study research, once the case(s) have been defined, the next step is referred to as "bounding the case" (Yin 2018:30). The purpose of bounding the case is to help determine the scope of data collection, as well as to understand which information is related externally to the case(s) (this is the context) and which information is related to the phenomenon of (or the happenings within) the case. Sketching the context of the cases is a critical step in case study research, before the units of data collection and the research methods can be solidified. As such, Chapter Three serves to contextualise the two case studies in this collective case study.

CHAPTER THREE:
CONTEXTUALISING THE CASE STUDIES

The previous chapter served to provide an overview on theories and literature related to design higher education, iterative design processes and play. Although certainly not exhaustive, the literature review reveals a gap in research with regard to including play in higher education, and more specifically in design higher education. The literature thus provides a springboard for the research to be conducted for this study.

This study makes use of a case study research methodology. More specifically, a collective case study is used, since it includes two cases – the Design for Development projects of 2019 and 2020. Because it is important to understand the history and context of the cases under observation in case study research (George & Bennett 2005; Cresswell & Poth 2016; Yin 2018), this chapter is focused on contextualising the two cases under observation in this study. As such, the chapter is structured according to the contexts in which the research is situated, namely: design higher education and the broader South African context, the Information Design programme in the School of the Arts, at the University of Pretoria, and the final year Information Design curriculum, which requires students to complete the Design for Development project. The briefs and deliverables of the respective Design for Development projects are described, and two project examples from each year are showcased to provide context and visual clarity.

3.1 Design higher education in South Africa

In Chapter Two of this study, I provide background regarding the evolution of design higher education from its apprentice-based and craft-based roots to a much more multi-disciplinary, complex and human-centred endeavour. As such, this section aims to provide context on the socio-political environment within which the BA Information Design programme is situated. The BA Information Design programme falls within the School of the Arts, in the faculty of Humanities, at the University of Pretoria, in South Africa. As a programme offered at a national university, it is subject to issues and concerns faced by higher education institutions across the country. In the context of a post-Apartheid South Africa, higher education institutions are still grappling with transformational teaching practices and strategies, as well as dealing with generational inequality that exists amongst students. For example, the #FeesMustFall movement, which began during mid-October of 2015, was in response to fee increases in South African universities; and spurred a

multitude of student protests at higher education institutions across the country. The protests, although initially in response to fee increases, also came about owing the growing sense of discontent among students because of the slow rate of transformation, with regard to curricula, demographics, institutional culture and governance at universities (Cassim 2020:523). In addition to this, according to Bosch (2016:159) the protests happened against a "broader background of declining government funding for higher education, together with widespread socio-economic inequalities and racial conflicts". The #FeesMustFall protests also spurred renewed debate in higher education about the notion of decolonising education in South Africa. On the topic of decolonising design higher education, Cassim (2020:524) stresses the importance of "nurturing critical literacy skills [in students so that they] can understand knowledge as a social construct". As such, Cassim (2020:525) proposes playful learning as one possible learning approach in design higher education that can help to decolonise design education; her rationale for this stance is that both play and design "favour inter-subjective relationships", involve multiple stakeholders, and "are hands-on activities that have to potential to strengthen social skills and also to build social capital". Although decolonising design education is not the focus of this research, it is important to be aware of the debate and realise the responsibility that design higher education has to foster critical thinking skills in students, and to encourage a human-centred approach to knowing and being in their environments.

3.2 BA Information Design at the University of Pretoria

As mentioned in the previous section, the BA Information Design programme (BA ID) is situated in the landscape of design higher education in South Africa. As a National Qualifications Framework[23] (NQF) level seven degree, the BA ID programme is structured to provide broad based design education, champion research-driven design and social awareness, and to offer students opportunities to gain industry experience and pursue postgraduate studies. The goal of the BA ID programme is to "foster and nurture in students a people-oriented attitude" and "deep rooted understanding and mastery of a set of discrete skills in design thinking and making" (Information Design Study Guide 2019:12).

[23] According to the South African Qualifications Authority (SAQA:2020), the National Qualifications Framework (NQF) is a framework within which the South African Qualification system is constructed; this framework presents "a set of principles and guidelines by which records of learner achievement are registered to enable national recognition of acquired skills and knowledge".

While training students to be reflective practitioners[24] (Schön 1983), there is a hope that fostering a people-oriented approach to solving "wicked problems" (Buchanan 1992) might ultimately cultivate design practitioners that strive towards the greater good of society (Information Design Study Guide 2019:12).

In keeping with Scön's (1983) philosophy, practical design teaching (including theoretical underpinnings and research) in the Information Design programme always take place within the context of practice. The "signature pedagogy" (Davis 2017) adopted in the Information Design programme is thus the studio, based on a system of scaffolding design projects dependant on the skill and rigour each project requires. Projects thus become more involved and complex, particularly with regard to demands on critical thinking and problem-solving skills required, as students build on their skills at each level of study. This model is similar to Davis' (2017:92-95) explanation of "the studio project as the signature pedagogy of design". The pedagogic style that most closely aligns with the approach followed in the Design for Development projects (2019 and 2020), or the case studies, is what Davis (2017:87-89) describes as a "coaching pedagogy". With a "coaching pedagogy," the lecturer takes the position of project facilitator, coach and mentor and falls somewhere between an expert and someone who "offers reflective prompts" (Davis 2017:87). During both Design for Development projects (2019 and 2020), emphasis was placed on independent learning and building an environment of mutual trust, following a constructivist approach to education (Davis 2017:91). Feedback provided to students served to steer them toward new avenues of thinking, with a focus on exploration and experimentation, while encouraging students to adopt a playful approach in their work. A typical project process followed by students during final year Information Design project is shown in Figure 2.

Figure 2, which serves as a process diagram, shows alternating patterns between divergent and convergent thinking modes. Students widen their exploratory lens, for example, when conducting research at the onset of the project, then narrow their focus once they have identified their own slant on the project brief. Thus, students are empowered to identify their own "wicked problem" within the constraints of the project brief. The blue dots in the

[24] Schön (1983) posited that the practices of professionals, based on experience rather than pure science, was inextricably linked to professional knowledge (Waks 2001:39). Thus, practitioners of design "apply tacit knowledge-in action", always functioning within the "languages of practice" when approaching wicked problems. Even the act of reflecting-on-action, for Schön (1983), happened in an environment not removed from tacit knowledge and "languages of practice" (Waks 2001:40).

diagram indicate spaces for intervention, dialogue, feedback or collaborative ideation between students and project facilitators (lecturers) and peers. During these sessions, students are “coached” in order to continue their project process. Depending on the outcomes of research conducted by students, technical constraints or feedback provided during class, students often move back and forth between various phases of the process. Thus, this design process is iterative, and has much in common with the “iterative design processes” described by IDEO (2020), and design thinking theorists Tim Brown 2009) and Kees Dorst (2015), as well as theorists of game design, such as Salen and Zimmerman (2004). These design processes were discussed in more detail in Chapter Two of this study.

3.3 How the Design for Development project fits into the BA ID programme

The previous section provided background on the aims and pedagogic approach of the BA ID programme. In this section, I aim to briefly position the Design for Development project within its context as a part of the Information Design 400 (IOW 400) year of study. Figure 9 illustrates where the project is positioned within the broader Information Design programme. According to the Information Design 400 study guide (2019), the entire Information Design programme is divided into three stages, namely beginner, intermediate and advanced. The first year of study is an introduction to the materials and techniques of basic visual expression; it is seen as a formative year of discovery. The second and third years of study together provide students the opportunity to focus on the core knowledge and practice of Information Design. These two years also place emphasis on the exploration and application of various areas of design thinking. The fourth year of study is the final stage and is considered as a period of advanced study. Here, students have the opportunity to explore the application of information design by means of “practical pathways and experiences that represent areas or pathways of professional practice” (Information Design study guide 2019). Thus, the final year of study places emphasis on design in practice and aims to prepare students as critical thinkers who will ultimately live and work as designers in a specific context. As illustrated in Figure 9, the Design for Development project, as part of the fourth year of study, is focused in particular on professional practice, citizenship, research ethics and sustainability; these competencies are nurtured by following an iterative design process (as illustrated in Figure 2).

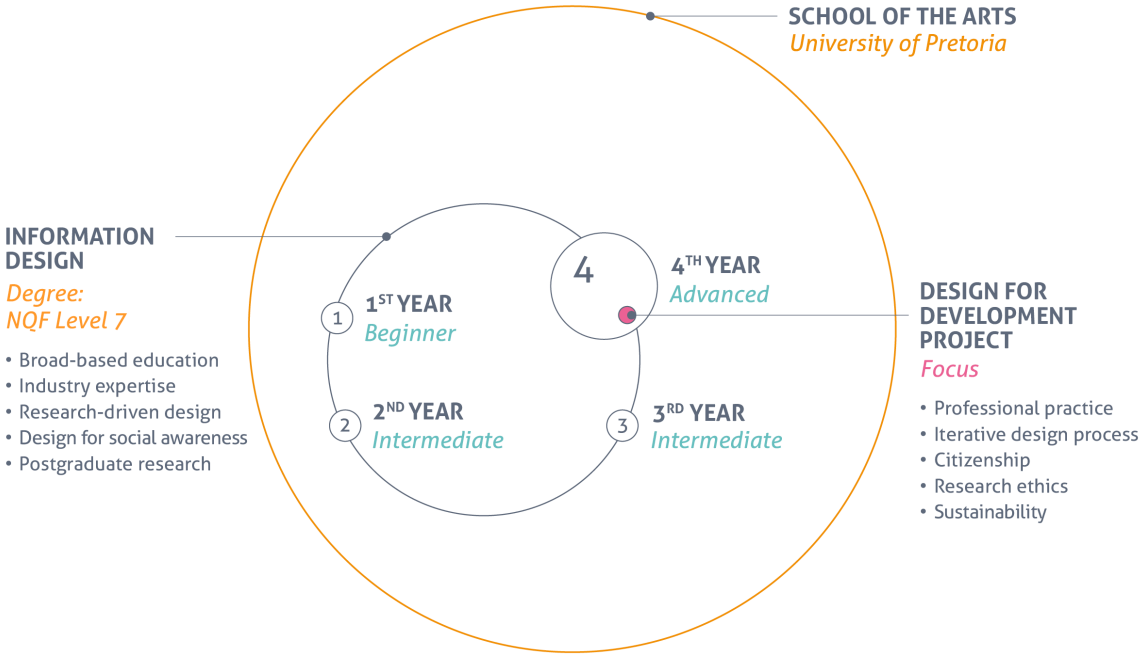

Figure 9: Design for Development project context

3.4 Commonalities and differences between the 2019 and 2020 Design for Development projects

The Design for Development project, as part of the Information Design 400 curriculum, presents the idea of design as a social practice. As such, even though the themes and outcomes of the projects differed slightly between 2019 and 2020, key ideas remained the same. The project intent was pitched as human-centred, which means that the user is considered and/or included in the design process. The ultimate users of the design solutions, in both instances, were children and their parents, guardians or caretakers. According to the student briefs of 2019 and 2020 (Cassim & van der Merwe), the project strategy focused on three over-arching components, being that it was interventionist, relevant and accountable. An interventionist strategy, in this instance, denotes a search for change as well as an improvement of existing capabilities. A strategy that is relevant, in the context of the project, meant that the immediate needs of children and their caretakers, most appropriate to their daily lives and activities, needed to be of greatest concern to students. Lastly, an accountable strategy is one where the project can be understood, adopted and acted upon by end users. Accountability also relates closely to the sustainability of design solutions. With regard to the project process followed for both 2019 and 2020, emphasis was placed on following an ethical process, especially when involving

participants in the research process. Students were tasked to collaborate with children, parents, teachers and early learning experts and were responsible for recruiting these participants, following the ethical project process described above. Engaging with participants during the design process was a valuable learning experience for students, as they had to familiarise themselves with the process of ethical participatory research, as well as gain written consent from all participants. Students also completed a child protection register, provided by the South African Police Service, before engaging with children. Both the student cohorts of 2019 and 2020 were required to work in groups to complete the project. Students took on the role of main agent, researcher and designer in the project process. The lecturers assumed the role of facilitator, acting as a springboard for ideas, probing and providing appropriate guidelines or advice. Contact sessions were equally frequent across both the 2019 and 2020 cohorts, although owing to the necessity of online teaching during the pandemic in 2020, all consultation sessions were conducted virtually for that year group. The major difference between the Design for Development projects of 2019 and 2020 was therefore the platform for which it was designed. In 2019, students were required to produce physical, play based toolkits that had to be manufactured as a prototype. In 2020, the brief was adapted to accommodate virtual contact sessions. Students were thus required to design apps, or digital play-based interventions. Figure 10 and Figure 11 show how the project slots into the final year Information Design curriculum (both in 2019 and 2020). What follows then are summaries of the unique focus of the 2019 and 2020 Design for Development projects respectively.

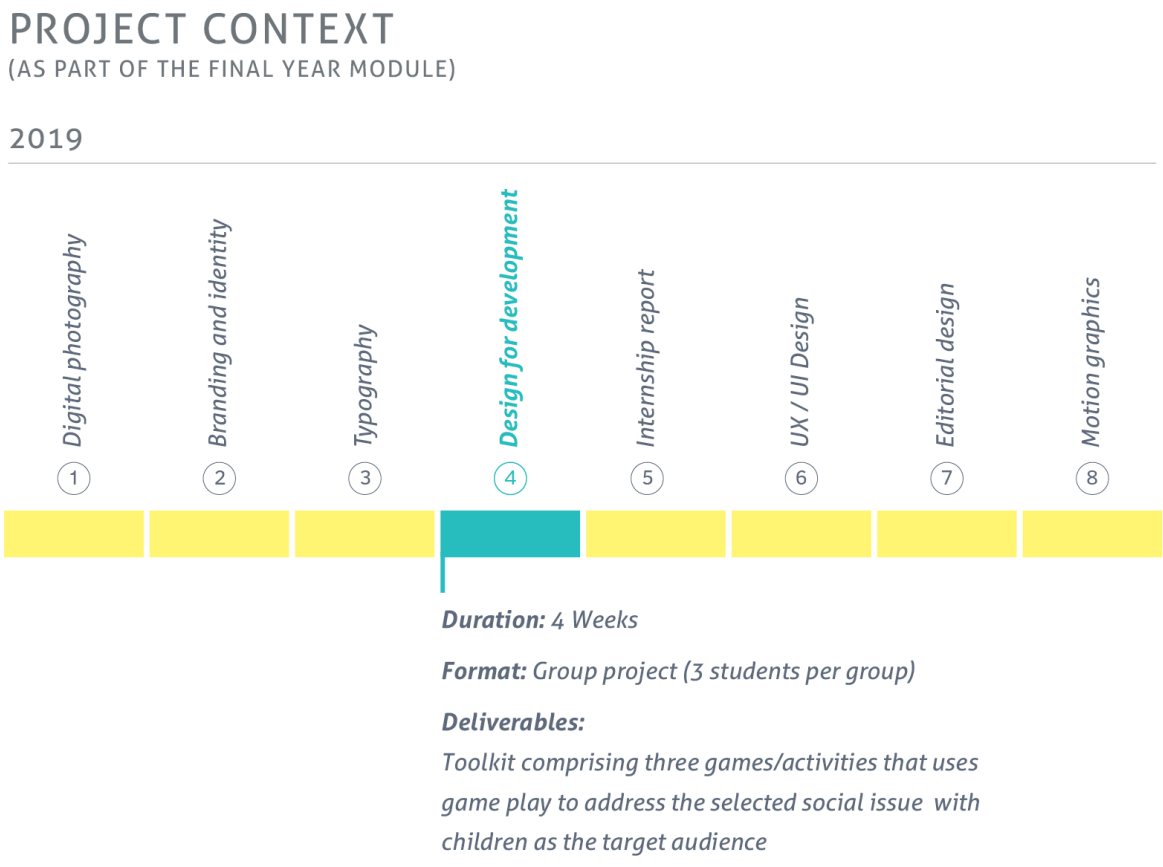

Figure 10: Design for Development project as part of the IOW 400 module in 2019

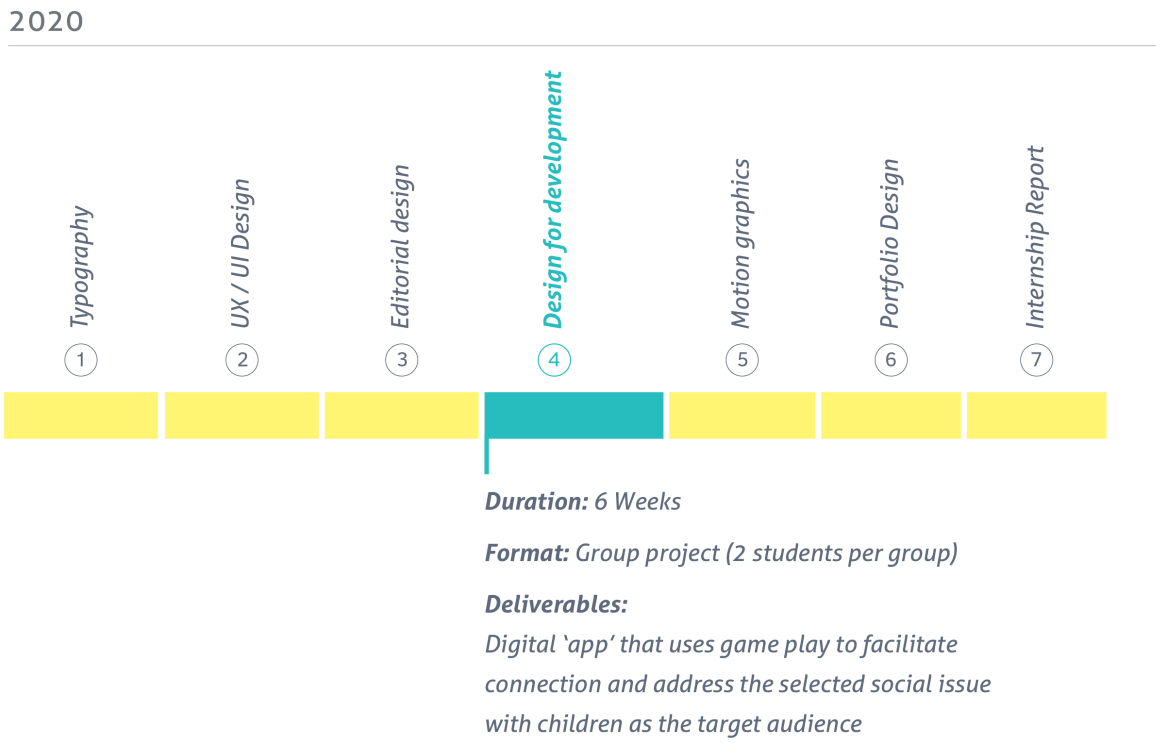

Figure 11: Design for Development project as part of the IOW 400 module in 2020

3.4.1 Teaching children creative problem-solving and design thinking skills through design principles: Project brief and examples from 2019

The Design for Development project of 2019 required students to conceptualise a toolkit that leverages design elements and principles as a point of departure to nurture creative problem-solving skills. Students were tasked to pitch their toolkits for children between the ages eight to twelve years. Design elements and principles[25] were used as a springboard for the creative concept, when coupled with some kind of social issue, or skill that children could nurture through playing with the toolkit. For example, the design principle of balance could be linked to the life-skill of time management, or healthy eating. The design deliverables required by the brief were physical toolkits that could include books, card games, board games, or any physical items appropriate to engage children in play. Students worked in groups of three to four to complete the project. The duration of the project was four weeks, in which students had to conduct secondary and primary research on their chosen theme – the social skill or issue they identified, coupled with their chosen design principle. The primary research in the early stages of the project often consisted of interviews with parents, teachers or specialists such as play therapists, educational psychologists, speech and language therapists and occupational therapists. Once a more concrete idea was solidified with the guidance of the facilitators, students could begin to put together rough prototypes that could be tested (played) with children. The prototyping phase proved critical to the project outcomes and this will be unpacked in greater detail in Chapter Five of this study. Two examples[26] of student projects are provided below for context: *Taste Buddies* (Figure 12) and *Kabusha* (Figure 13).

[25] The list of design elements and principles that students were given as prompts include contrast, emphasis, repetition and pattern, variety, proportion or scale, rhythm and movement, balance, and harmony or unity.

[26] All project examples from 2019 and 2020 are included in Appendix A. Students who wished to be acknowledged when displaying visual examples of their work are also acknowledged in Appendix A.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
TASTE BUDDIES	**KINDNESS THROUGH FOOD**	**VARIETY**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, MASTERY PLAY, CREATIVE PLAY**	

SUMMARY

Taste buddies shows how food can be used as a means to foster connection and encourage kindness. A biblioplay activity illustrates how food varies across cultures and how kindness can be shown through food and hospitality. Monster Munchies is a food-themed memory game that encourages team work. Cooking With Friends, a stack of recipe cards, encourages children to make healthy snacks for themselves and their friends, by making use of creative and mastery play.

Figure 12: Taste Buddies *overview, 2019*

The first example, *Taste Buddies* (2019) aimed to show how food could be used as a means to show kindness or encourage connection. The design principle of variety was leveraged as a metaphor to show that variety (in food and by embracing different cultures and customs) makes life more vibrant. Thus, *Taste Buddies* (2019) aims to encourage diversity, tolerance and respect.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
KABUSHA	**ENVIRONMENTAL RESPONSIBILITY**	**HARMONY**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, DRAMATISED, MASTERY, CREATIVE & SENSORY PLAY**	

SUMMARY

Kabusha champions harmony in nature by teaching children about our impact on the environment through play. The activities in the toolkit include a storybook, a boardgame, a scavenger hunt and a sensory play (playdough) activity. Each activity harnesses different kinds of play to deepen learning. For example, the scavenger hunt requires children to search for found objects in their homes in order to up-cycle them and complete creative challenges.

Figure 13: Kabusha overview, *2019*

The second example, *Kabusha* (2019) tackles environmental responsibility by using the design principle of harmony to illustrate how ecosystems within our environment are interconnected. The toolkit has a distinct South African relevance in its setting: the ecology and animal characters in the game are all relevant and well researched for a local context. In addition, emotive illustrations and interactions between characters in the story (a frog, wild dog and a dung beetle) help to build rapport with, and create empathy for, these animals in their environment.

3.4.2 Designing digital, game-based interventions that encourage connection through play: Project brief and examples from 2020

The Design for Development project of 2020 aimed to address issues highlighted during the COVID-19 pandemic, such as increased isolation and the need for connection. In light of this, the brief required students to design digital, game-based interventions that leverage the act of playing as a means to encourage connection within the family unit. Students were asked to design their apps for children between the ages of six and eight. This decision

was informed by the work of Debra Gelman (2014), who wites in her book, *Design for Kids: Digital Products for Playing and Learning,* that digital solutions for this age group work well when a tangible connection is present between the digital world and the children's reality. In addition, this age group should have a foundation of literacy, but instructions and digital interfaces need to be designed intuitively with minimal instruction (Gelman 2014). This posed a challenge in information design for the students, who needed to take heed to the particular needs of the age group.

During the project briefing session (2020), in a presentation on design research and prototyping by the project facilitators, students were presented with the idea that they needed to approach the project through three lenses. The first of these was the lens of playful participation, that considers how play could encourage families to engage and interact in more meaningful ways. Secondly, the lens of argumentation considered how people could be engaged in play in a way that stimulates creative and critical thinking. Thirdly, the lens of persuasion or motivation required students to consider how behaviour change might come about as a result of families' interactions with these playful experiences. As a part of this, students were encouraged to consider different kinds of motivation – extrinsic and intrinsic – in the designs of their apps.

With regard to prototyping and personal access to children and their parents, students needed to find virtual ways to conduct their prototyping sessions. The design software, Adobe XD, that was used to design the apps, presented an opportunity to create rapid prototypes, which could then be sent to children and parents for feedback. Where possible and permissible, face-to-face prototyping and play testing was also orchestrated by some student groups. Two examples of student projects, *Bond* (2020) (Figure 14) and *Bopper* (2020) (Figure 15), which follow, are shown for context.

The first example, *Bond* (2020) leverages a playful, detective theme in pursuit of fostering emotional intelligence and empathy in children. Students developed one game in its entirety for the purposes of the project, called "Mysterio". In this game, opponents need to act out an emotion word, similar to the game "Heads Up!", that is held up by the other player. The role-playing aspect of the game helps to build children's emotional literacy skills. *Bond's* (2020) interface was designed in such a way that multiple levels are included in the game. It is also possible to play via video, which makes the game ideally suited to a scenario where players seek connection, but are physically separated.

PROJECT NAME	PROJECT THEME
BOND	**EMPATHY AND EMOTIONAL INTELLIGENCE**
TYPES OF PLAY INCLUDED	**DRAMATISED PLAY, MASTERY PLAY**

SUMMARY

Bond is a detective themed app that aims to build empathy and emotional intelligence in children, by making abstract concepts more accessible through play, including role-play. The game 'Mysterio' was developed in its entirety for the purposes of the project; it is a role-playing, emotion-detecting game that builds children's emotional vocabulary, empathy and perspective taking skills. With varying levels of difficulty, children act out emotion words for their opponents to guess.

Figure 14: Bond *overview, 2020*

The second example, *Bopper* (2020) was designed in response to the challenge faced during the onset of the COVID-19 pandemic in 2020, which made it very difficult for children to visit their older relatives or grandparents. As such, *Bopper* (2020) leverages dance as a means to bring families together through virtual, physical play and movement. The app features various dance-themed challenges, which can be recorded and shared outside of the game space. By including music and dance styles that span generations, the app also aims to build connection through learning, storytelling and through experiential play.

PROJECT NAME	PROJECT THEME
BOPPER	**INTER-GENERATIONAL FAMILY BONDING THROUGH DANCE**
TYPES OF PLAY INCLUDED	**PHYSICAL PLAY, MASTERY PLAY, DRAMATISED PLAY**
SUMMARY	
Bopper is an interactive app designed to strengthen inter-generational family bonds through dance. Designed to bring families closer together during the COVID-19 Pandemic, families can dance together virtually, completing various danced-themed challenges: some that evoke a sense of nostalgia for older family members and some that allow children to share their music with their families in a fun way. Dances can be recorded, shared and completed individually or together.	

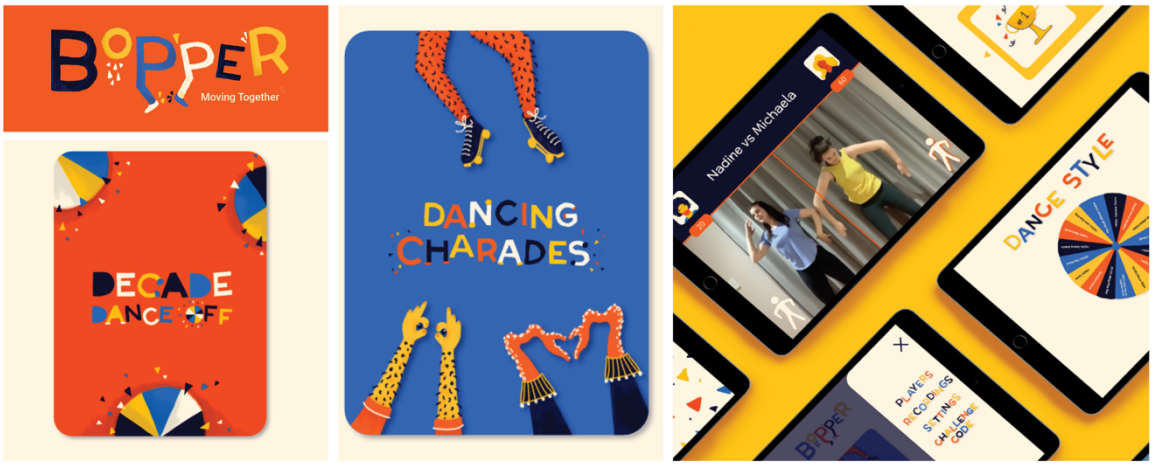

Figure 15: Bopper *overview, 2020*

Chapter Three has provided background and information regarding the context of the two cases under investigation in this collective case study. This has been done by discussing the broader context of design higher education in South Africa; by discussing the pedagogic approach and background of the BA ID programme; and lastly by providing information on the unique requirements for the projects of 2019 and 2020. Building on the foundation of this context, the next chapter considers the research paradigm, research methodology and methods selected for this case study research. Chapter Four also focuses on explaining the units of data collection for this study, as well as explaining the particular way in which research methods are employed for data analysis.

CHAPTER FOUR:
RESEARCH DESIGN

The aim of the previous chapter was to heed the call for case study research to be well grounded in the history and context of the cases (George & Bennett 2005; Cresswell & Poth 2016; Yin 2018). As such, Chapter Three began by considering the broader context of design higher education in South Africa, thereafter zooming in on the BA Information Design programme at the School of the Arts, at the University of Pretoria. Next, the final year BA ID curriculum was discussed, before focusing on the two Design for Development projects (of 2019 and 2020) that make up the two cases in this collective case study. For each project, the requirements of the student briefs were explained and individual project examples were used as vignettes to aid understanding with regard to context, as well as the project themes and outcomes. Following the contextual elucidation of the case studies, Chapter Four outlines the research design for this study, and illustrates how this design has been structured to answer the research question.

To recap, the **aim** of this case study research is to answer the following question:

How *does introducing play in the context of design higher education influence students' design process?*

Sub-questions that this study aims to explore tie in with the following **objectives**:

- To explore and describe what is unique about the Information Design students' design process when compared to the widely adopted iterative design process;
- To explore and describe how students experience play as part of their own design process;
- To explore and describe how these experiences manifest in tangible design outcomes.

To answer the research question and meet the abovementioned objectives, the study makes use of a collective case study, since it includes two cases – the Design for Development projects of 2019 and 2020 (these make up the units of analysis in the collective case study). The study is aligned with Cresswell and Poth's (2016) and Yin's (2018) definition of a case study as research methodology. Specifically, Cresswell and Poth (2016:158) state that:

> Case study research is defined as a qualitative approach in which the investigator explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving ***multiple sources of information*** (e.g. observations, interviews, audiovisual material, and documents and reports), and reports a ***case description*** and ***case themes.*** The unit of analysis in the case study might be multiple cases (a ***multisite*** study) or a single case (a ***within-site*** study).

According to Yin (2018:3) a case study methodology is appropriate when the desire of the researcher is to study some contemporary event or set of events, where contemporary means a fluid rendition of the past and the present, not just the present. Yin (2018:12) continues that, while case studies have much in common with a history methodology, it is their inclusion of sources of evidence like direct observation and participant interviews that make them unique. In addition, the strength of a case study methodology lies in its ability to "deal with a full variety of evidence – documents, artifacts, interviews, and direct observations, as well as participant-observation" (Yin 2018:12). As this study is retrospective in nature, focused on the Design for Development projects of 2019 and 2020, a case study methodology is well suited to understanding the nuances of context and gaining a broad overview of the full variety of evidence produced during the project.

The nature of this qualitative research is both exploratory and descriptive. According to Fouché (2002:109), exploratory research is appropriate when conducting research "on a new area of interest", with the aim of collecting and explaining new data. Exploratory research also provides the opportunity to "become acquainted with a situation so as to formulate a problem or develop a hypothesis" (Fouché 2002:109). Building on an exploratory approach, descriptive research presents a picture of the specific details of a situation and provides truthful, in-depth descriptions of a phenomenon and its deeper meanings (Fouché 2002:109). Furthermore, Yin (2018:10) states that exploratory and descriptive case studies are well suited to "how" and "why" research questions, as these are usually concerned with real-life events or operational processes that take place over a period of time, as opposed to isolated incidents or phenomena.

The next section of this chapter outlines the research paradigm adopted for this research, as well as the related research methodology and methods selected.

4.1 Research Paradigm

As a qualitative research study, the proposed research aims to “generate knowledge that is seen to reflect the reality of individuals and groups”, as opposed to quantitative research that chiefly “seeks to validate knowledge and its potential global application through empirical testing” (Birks 2014:8). Melanie Birks (2014) explains that an understanding of the “researcher’s personal philosophical position” promotes “congruence between [the] research question, methodology and the conduct of a qualitative study”. As such, the proposed research aligns with an interpretivist research paradigm, including the belief that “human beings are not simply thoughtless and helpless; our actions are the product of our judgements, reasons and intentions” (Burgess in Birks 2014:4). In addition, interpretivism “allows its descriptions and explanations of human beings and their concerns to be subtly and thoughtfully imbued with human values” (Burgess in Birks 2014:4). Burgess (in Birks 2014:4) mentions that interpretivism is sometimes referred to as constructivism – or social constructivism (Cresswell & Poth 2016) – but its position in relation to other research paradigms (as shown in Figure 16) remains the same.

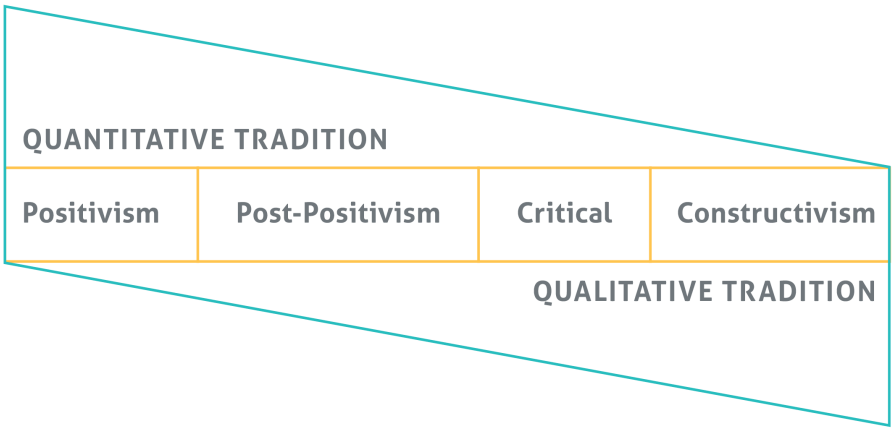

Figure 16: Philosophical Moments and Research Paradigm (Birks 2014:6)

Snape and Spencer (in Pitard 2017) explain that, with an interpretivist / constructivist research paradigm, the researcher and social world impact one another; findings are thus influenced by the researcher’s perspective and values. As such, when conducting interpretivist research, research questions are often derived from the personal context of the researcher. Burrell and Morgan (1979:28) explain that an interpretive paradigm “is informed by a concern to understand the world as it is, to understand the fundamental nature of the social world at the level of subjective experience”. Thus, an interpretivist

perspective is an appropriate choice for the proposed research. Being part of the design process in the capacity of joint project facilitator gives me as the researcher insight into student and project observations based on subjective experience. Birks (2014:9) argues that qualitative research "requires an investment of the self". It is also imperative that there is "alignment between the methodology and the philosophical position of the researcher" (Birks 2014:9).

In order to establish such a philosophical position, it is necessary to state the ontological, epistemological and axiological stance taken in conducting this research. Ontology refers to "the study of being" and, as such, qualitative research calls for "an understanding of the ontological concepts of *existence* and *reality*" (Birks 2014:6). This study aligns with a relativist ontology, which assumes that reality is a subjective construct made up of our interpretations and understandings (Birks 2014:7). Epistemology is "the branch of philosophy concerned with knowledge" – epistemology is thus concerned with the ways in which we gain knowledge of reality (Petty *et al.* in Birks 2014:7). Birks (2014:8) explains that "qualitative research methodologies can generate theory" by means of induction, as opposed to deduction, which is traditionally aligned more with positivist approaches to "test theory". From an epistemological perspective, therefore, this research takes the stance that generated knowledge "reflects the reality of individuals and groups" from a subjectivist perspective (Birks 2014:9). Lastly, the axiological perspective of the researcher refers to the "value-stance taken by the inquirer" (Cresswell & Poth 2016). As mentioned in the introduction, my axiological perspective as both educator and researcher is aligned with Donald Schön's (1983) belief that design is a reflective practice reliant on learning and reflection in- and on-action. Hence, I approach my role as a design educator as a reflective practitioner and educator. Furthermore, my pedagogic approach is aligned with Davis' (2017:87) explanation of a coaching pedagogy, where the lecturer acts as a facilitator, offering reflective prompts and actionable suggestions that can be accomplished within the timeframe of the project.

Table 5 provides a summary of the interpretivist research paradigm adopted for the proposed research, as well as a summary of the research methodology and research methods. The research methodology and methods are subsequently discussed in more detail in the latter sections of this chapter.

INTERPRETIVIST / SOCIAL CONSTRUCTIVIST RESEARCH PARADIGM

RESEARCH PARADIGM, METHODOLOGY AND METHODS (SUMMARY)

QUALITATIVE RESEARCH: CASE STUDY METHODOLOGY	
UNIT OF ANALYSIS: CASES (DESIGN FOR DEVELOPMENT PROJECTS OF 2019 & 2020)	
COLLECTIVE CASE STUDY: WHAT IT COMPRISES	
• A case is understood as a "bounded system" with clear limits of time and place (Cresswell 1998:61) • In a collective case study, one issue is selected, with the "inquirer selecting multiple case studies to illustrate the issue" (Cresswell & Poth 2016:161) • The multiple case study examines two years of the design for development project completed in BA Information Design at the University of Pretoria (2019-2020) • The design process of the students are the unit of study	
RESEARCH METHODS	
Methods: • Cross-case analysis (Yin 2018) • Qualitative content analysis (Elo & Kyngäs 2008)	**Data collection:** • Written student reflections (2019 & 2020) • Student project process documentation (2019 & 2020) • Student class consultations (transcribed recordings (2020)) • Teaching observations (2019 & 2020) • Student toolkits (2019) and app prototypes (2020)
AXIOLOGY	
Reflective practitioner This view is aligned with Donald Schön's (1983) belief that design education, like the practice itself, is a reflective practice reliant on learning and reflection in- and on-action.	
EPISTEMOLOGY	
Subjectivist This research takes the stance that generated knowledge "reflects the reality of individuals and groups" from a subjectivist perspective (Birks 2014:9).	
ONTOLOGY	
Relativist A relativist ontology assumes that reality is a subjective construct made up of our interpretations and understandings (Birks 2014:7)	

Table 5: Summary of research paradigm, methodology and methods summary

4.2 Research methodology: the collective case study

The research methodology selected for the proposed study is a collective case study. Cresswell and Poth (2016:161) explain that, in a collective case study (or multiple case study), the researcher focuses on one issue or concern, but "selects multiple case studies to illustrate the issue". As Cresswell and Poth (2016:158) explain, in a case study research methodology, the unit of analysis of the study is the case in question. In the instance of this collective case study, the cases of the 2019 and 2020 Design for Development projects comprise the units of analysis for the proposed research. According to Harrison *et al* (2017:1), "case study research has grown in reputation as an effective methodology to investigate and understand complex issues in real world settings". Case study research is viewed as a valid form of enquiry particularly when "human behaviour and social interactions are central to understanding topics of interest (Harrison *et al* 2017:12).

Furthermore, Harrison *et al* (2017:3) provide a substantiation for the appropriateness of a case study methodology in the context of education:

> Simple in theory yet complex in nature, the planning, preparation and execution of case study research has developed to a point where the continued application of case study research across a number of professions particularly education, health and social sciences, has provided a unique platform for credible research endeavours.

Yin (2018) explains the benefits of using multiple case studies (or collective case studies (Cresswell & Poth 2016). According to Yin (2018:57), when making use of multiple case studies, "each individual case becomes the subject of a whole case study, in which convergent evidence is sought regarding the findings and conclusions for the study; each case study's conclusions are then considered to be the information needing replication by the other individual case studies". Thus, this allows for replication logic between cases as well as cross-case synthesis; these are two of the benefits of collective case studies. In addition, Yin (2018:59) explains that "literal replications" involve the use of two or more case studies in which the researcher has prior knowledge of the outcomes of the cases. Such literal replications are particularly suited to research questions concerned with how a particular event or phenomena unfolded, as in the case of this research study.

The collective case in question for this research is the Design for Development project, as detailed in Chapter Three. The focus of the collective case study is the **design process** followed by students while engaged in the project. In order to form a more complete picture of the design process, and to enable replication logic (Yin 2018:59), the study includes two years (and thus two cohorts of student design processes) in which the project took place: 2019 and 2020. This selection is in keeping with Cresswell and Poth's (2016:161) and Yin's (2018) explanation of a collective case study, as outlined above. Yin (2018:54) notes that, in multiple case study design, the logic of replication is used, where the inquirer replicates the procedures for each case. As indicated above, according to Yin (2018:59), this strategy makes sense when the researcher has some prior knowledge of the outcomes of the cases (for example, when a "why" or "how" research question is posed with regard to a particular event, process or programme). This prior knowledge allows for a tighter line of enquiry and better replication, as well as cross-case analysis, when considering the outcomes of each case. A multiple case study is thus an appropriate choice for the proposed research, as the general project structure and design processes remained the same between the years 2019 and 2020. However, subtle differences in the project contexts, as outlined in Chapter Three, might provide points of comparison amongst the two cases. This study draws from Yin's

seminal book *Case Study Research and Applications: Design Methods* (2018), as well as Cresswell and Poth's *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (2016) to streamline the case study research design. Figure 17 shows the structure of the multiple case study design, where each case is considered holistically, within its own context, and each forms a unit of analysis within the study. The sources of evidence collected in each case study, as shown in Figure 17, comprise the units of data collection in the study. This is in keeping with Yin's (2018) and Cresswell and Poth's (2016:159) suggestion to complete in-depth data collection involving multiple sources of information. More information on the sources of information is provided in the data collection section of this chapter.

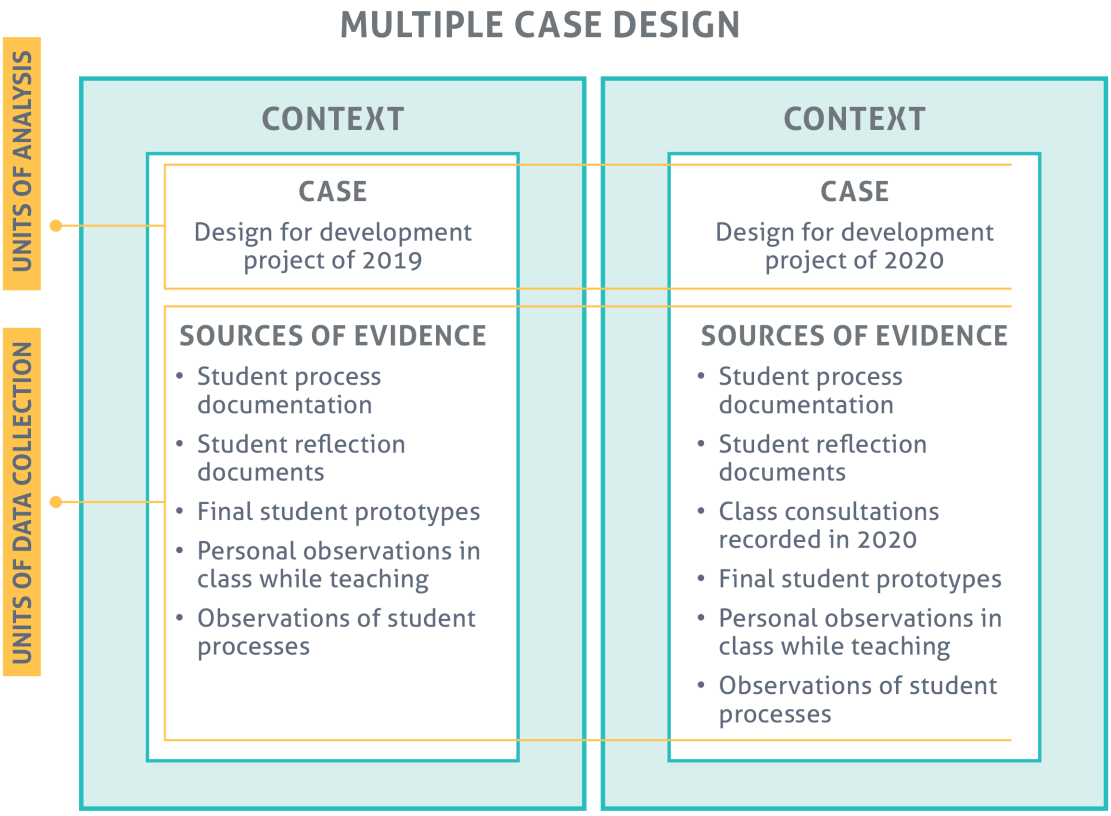

Figure 17: Multiple case research design. Adapted from Yin (2018:47).

4.2.1 Striving for a rigorous case study research design

When considering validation and reliability in qualitative research, many differing perspectives exist with regard to its importance, its definition, how it may be described, as well as procedures that could be used to establish it (Cresswell & Poth 2016:376). This study is aligned with an interpretivist research paradigm, in which the subjective position of

the researcher plays an integral role in making meaning of the research findings. As such, the position of the research with regard to validity and reliability is in keeping with Cresswell and Poth's (2016:384) stance on validation in qualitative research:

> We consider "validation" in qualitative research to be an attempt to assess the "accuracy" of the findings, as best described by the researcher the participants, and the readers (or reviewers). This view also suggests that any report of research is a representation by the author. We also view validation as a distinct strength of qualitative research in that the account made through extensive time spent in the field, the detailed thick description, and the closeness of the researcher to participants in the study all add to the value and accuracy of a study.

This research is thus aligned procedurally with Yin's (2018) recommendations for conducting case study research, while making use of Cresswell and Poth's (2016) strategies of research validation. Cresswell and Poth (2016:386) present nine research validation strategies, grouped by the lens that each validation strategy represents, namely: the researcher's lens, the participant's lens and the reader or reviewer's lens. Cresswell and Poth (2016:384) recommend that researchers make use of at least two of the validation strategies in any study. The strategies selected for the validation of this research are discussed below, and summarised in Figure 18 at the end of this section.

- **Corroborating evidence through triangulation**
  As mentioned previously in this chapter, one of the benefits of case study research is that it relies on the interpretation of multiple sources of information (Cresswell & Poth 2016; Yin 2018). According to Cresswell and Poth (2016:385), when different sources of data are interpreted in a research study, this allows for data triangulation, which affords validity to the research findings. Because this research study makes use of multiple sources of evidence across the collective case study, this research validation strategy is an appropriate choice.
- **Discovering a negative case analysis or disconfirming evidence**
  Cresswell and Poth (2016) and Yin (2018) both stress the importance of looking for pieces of evidence that may not fit the initial research hypothesis, or that does not fit the typical pattern of the research findings. These alternative pieces of evidence, or "points of intrigue" could become points of discussion when writing up the findings. Because the two cases under observation share many similarities, being alert to

points of difference when analysing the empirical evidence will help to strengthen the validity of the research findings.

- **Clarifying researcher bias or engaging in reflexivity**
  Clarifying researcher biases and continuously engaging in reflexivity throughout the research process can be employed as a strategy to validate research (Cresswell & Poth 2016:386). This strategy is also in-keeping with the position of this study; approaching the case studies from an interpretivist research lens. Here, it is important to note past experiences of the researcher, biases and prejudices, and any orientations or positions that could have shaped the interpretation or approach of the research (Cresswell & Poth 2016:386). As such, my role as co-facilitator in both Design for Development projects is key to my interpretation of the research findings. In addition to this, my position as a white, South African born female working in a particular academic environment at the University of Pretoria shapes my interpretation of the research findings. The city of Pretoria is the administrative capital of South Africa, and the city in which the office of the State President is located. Pretoria has a history fraught with tension, violence and oppression and, as the administrative capital, still displays "problematic extant colonial objects and images" such as monuments, street names or icons that make reference to the Apartheid regime (Ebewo 2020). Furthermore, the city structure of Pretoria continues largely to reflect segregation inherited from the apartheid regime, where wealthy inhabitants live in suburbs and townships are relegated to the outskirts of the city (Ebewo 2020). Despite efforts of transformation and reconciliation, the city continues to grapple with issues of power, inequality and economic segregation. My eight years of experience teaching a variety of design higher education projects also shapes my interpretation of the research.
- **Having a prolonged engagement and persistent observation in the field**
  Eight years of prior teaching experience in the field of design higher education, spanning a variety of project themes, as well as prior experience with the Design for Development project (pre-2019 and 2020), affords me the opportunity to have a deeper insight into the site and context of this research study. This is in keeping with Cresswell and Poth's (2016:387) recommendation for spending as much time in the field as is feasible, in order to make use of this validation strategy.
- **Generating rich, thick descriptions**
  Thick descriptions have the benefit of allowing a reader to make decisions regarding the transferability of a study, because of the detailed descriptions provided of an

event or participants under observation (Cresswell & Poth 2016:389). Detail included in such thick descriptions could include physical descriptions, description of movement and atmosphere, as well as general themes and interconnected ideas. The use of action verbs and quotes aids thick description (Cresswell & Poth 2016:389). Because of my role as co-facilitator of both projects in this collective case study, I can draw from observation and experience to generate thick descriptions, thereby strengthening the validity of this research study.

The circles highlighted in orange (Figure 18) indicate which validation strategies were selected for this research study.

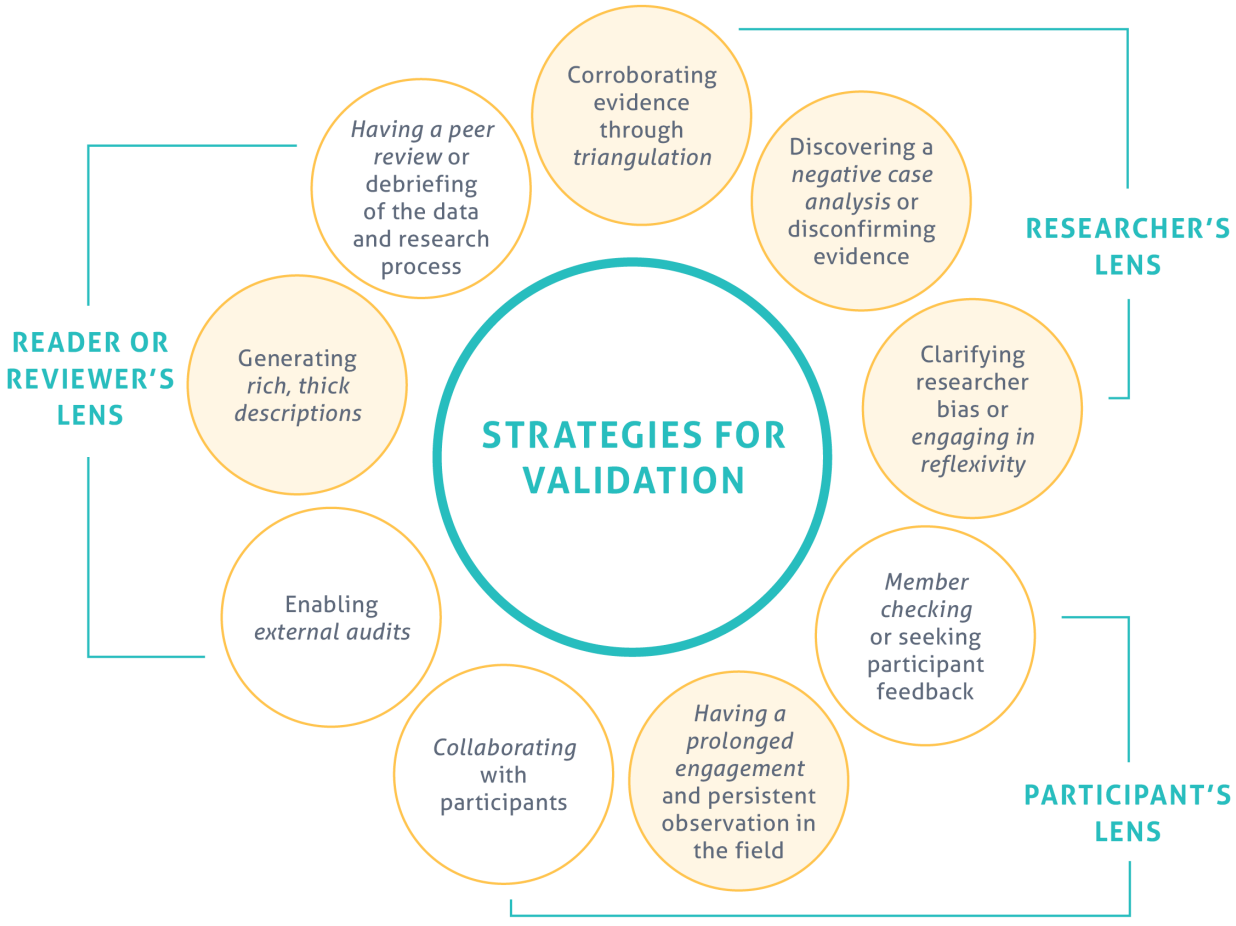

Figure 18: Validation strategies in qualitative research (Adapted from Cresswell & Poth 2016:386).

This section has explained the research validation strategies (Cresswell & Poth 2016) that have been selected for this study (as shown in Figure 18). In addition to considering the validity of the research, the study considers Yin's (2018:242) recommendations for

conducting “an exemplary case study”. In order to do this, Yin (2018) suggests the following:

- **The case study must be “complete”**
  Although “completeness” is difficult to quantify, Yin (2018:244) argues that completeness could be achieved by giving attention to the boundaries of the case (with regard to space, time and context); when the researcher has demonstrated an attempt to collect all evidence relevant to the case(s); and if the case is able to run its course with regard to completion within the stipulated timeframe. In the case of this research study, these conditions of “completeness” are met because the boundaries of the case are clearly defined, all relevant evidence has been collected for both cases under observation, and the retrospective nature of the case studies means that both are naturally “complete” with regard to the timeframe in which the projects took place.
- **The case study must consider alternative perspectives**
  Considering alternative perspectives relates to Cresswell and Poth’s (2016) validation strategy discussed above, namely “discovering a negative case analysis or disconfirming evidence”. Yin (2018:245) argues that an investigator ought to seek alternative perspectives that challenge the assumptions of the case study, or that “portray highly insightful perspectives”. The use of a collective case study methodology is beneficial when attempting to discover alternative perspectives, as this method enables the use of replication and cross-case synthesis (Yin 2018).
- **The case study must display sufficient evidence**
  Yin (2018:113) suggests making use of a “case study database”, where all data is collated in a manner that could easily be referred to by a third-party researcher. In addition to this, Yin (2018:246) stresses that all “critical pieces of evidence” should still be part of the final research composition. This final case composition should represent the critical evidence in such a way that a reader could arrive at “an independent judgement regarding the merits of the case study’s findings” (Yin 2018:246). This study makes use of a case study database (included in Appendix B) and Chapters Five and Six focus on first collating the critical empirical evidence,

after which a cross-case synthesis and discussion present an interpretation the findings.

- **The case study must be composed in an engaging manner**
  Lastly, Yin (2018:246) argues that a case study must be composed in an engaging manner, both visually and in writing. The use of a clear and enticing writing style, as well as a strong indication of enthusiasm on the part of the researcher, are key contributors to creating a case report that is engaging.

As mentioned at the start of this section, this study refers to Cresswell and Poth's (2016) strategies for research validation to arrive at a rigorous case study research design. Yin's (2018) suggestions for conducting an "exemplary case study" provide valuable procedural suggestions for conducting the research, as well as useful suggestions on how to structure, interpret and present empirical findings. The next section of this chapter provides more information on the units of data collection used in this study.

4.2.2 Units of data collection

This section outlines the rationale for the selection of data to be analysed in this study, while bearing in mind how the validity and reliability of the research is impacted by the chosen units of data collection. As one major advantage of conducting case study research is to do an in-depth study of a particular phenomenon in its real-world context, using multiple sources of evidence is critical to the success of a case study research design (Yin 2018:127). The use of multiple sources of evidence also permits the researcher to "develop *converging lines of inquiry"* (Yin 2018:127), thus increasing the validity of case study findings. Converging lines of enquiry also make data triangulation possible, where information from multiple sources could be used to corroborate the same findings (Yin 2018:128). Yin (2018:128) stresses that developing convergent evidence, by corroborating findings from multiple sources of evidence, one can strengthen the construct validity of a case study. This collective case study thus makes use of multiple sources of evidence, sourced from each case. More detail about the units of data collection is shown in Table 6.

CASE 1 Design for development project of 2019	
NUMBER OF STUDENTS	**37**
NUMBER OF PROJECTS	**11**
STUDENT PROCESS DOCUMENTATION	
This includes primary and secondary research, sketches and design process work compiled by students. Physically handed in in the form of files or bound documents. **CODE IN TEXT:** Project number, year, E.g. **P1'19**	
STUDENT REFLECTION DOCUMENTS	
Guided reflection document filled in by students as part of the project process. **CODE IN TEXT:** Student number, year, E.g. **S4'19**	
FINAL STUDENT PROJECTS	
Physical, printed toolkit mockups. **CODE IN TEXT:** Project number, year, E.g. **P1'19**	
PERSONAL TEACHING OBSERVATIONS	
Observations noted during contact teaching sessions and during the play workshop.	
OBSERVATIONS OF STUDENTS' PROCESS	
Observations of students' process and work-flow during the course of the project.	

CASE 2 Design for development project of 2020	
NUMBER OF STUDENTS	**34**
NUMBER OF PROJECTS	**17**
STUDENT PROCESS DOCUMENTATION	
This includes primary and secondary research, sketches and design process work compiled by students. Compiled digitally as a comprehensive project process document. **CODE IN TEXT:** Project number, year, E.g. **P1'20**	
STUDENT REFLECTION DOCUMENTS	
Guided reflection document filled in by students as part of the project process. **CODE IN TEXT:** Student number, year, E.g. **S4'20**	
FINAL STUDENT PROJECTS	
Working prototype of app. **CODE IN TEXT:** Project number, year, E.g. **P1'20**	
RECORDINGS OF 2020 CLASS CONSULTATIONS	
Recordings of 14 class consultations, conducted via Zoom. Recordings were transcribed using Otter.ai. **CODE IN TEXT:** Student number, year, E.g. **S4'20** Facilitator number, year, **E.g. F2'20**	
DATE	DURATION
2020-08-26	04:04:02
2020-08-28	04:00:21
2020-08-31	03:39:55
2020-09-02	03:14:23
2020-09-14	03:14:36
2020-09-16	03:25:55
2020-09-21	03:23:47
2020-09-23	03:11:15
2020-09-28	03:16:00
2020-09-25	03:21:20
2020-09-30	02:57:38
2020-10-02	03:06:31
2020-10-05	02:57:31
2020-10-08	02:20:58
PERSONAL TEACHING OBSERVATIONS	
Observations noted during contact teaching sessions and during the play workshop.	
OBSERVATIONS OF STUDENTS' PROCESS	
Observations of students' process and work-flow during the course of the project.	

Table 6: Sources of evidence / units of data collection

All data was collected during the respective Design for Development projects (2019 and 2020); thus, the makeup of the students in the study was determined by those enrolled for the BA Information Design degree. To give a holistic picture of the student design process, all student work is included in the sample selection (providing that consent was given by

the students). With regard to how evidence is gathered, Yin (2018:130) suggests that a case study researcher makes use of a case study database, which enables external readers access to the raw data analysed when writing up the findings in the case report. This means that raw data needs to be compiled in a document separate from the case report. The benefit of compiling such a document is that raw data may be viewed separately from the author's interpretation of the data, thus "markedly increasing the *reliability*" of the case study (Yin 2018:131). The units of data collection shown in Table 6 are all included in the case study database (Appendix B) that accompanies this research study.

4.3 Research methods

When conducting a collective case study, and especially one that consists only of two cases, a researcher is afforded the opportunity of using a cross-case synthesis as a technique to analyse the data (Yin 2018:194). Approaching a collective case study in this manner means that each case is considered holistically, with the aim of retaining the integrity of the respective cases, before the two cases can be compared to search for within-case patterns across the cases (Yin 2018:196). Yin (2018:197) stresses the importance of taking a conceptual approach when conducting a cross-case synthesis, rather than focusing on individual variables in the cases. This conceptual approach is appropriate for case study research, which favours a holistic approach to understanding a phenomenon in its real-world setting (Yin 2018:197). Following a cross-case synthesis method as outlined by Yin (2018), this study views each case as a separate, holistic unit of analysis. The research methods used for each case under observation are outlined in Figure 19.

The first step is to sketch a case context for each year of the Design for Development project under observation (2019 and 2020). Next, the sources of evidence within each case (the units of data collection) are analysed using qualitative content analysis as a method of analysis. For the design for development project of 2019, the sources of evidence are: the student process documentations (physical documents); student reflection documents (physical documents); final student prototypes (the printed project mockups); personal teaching observations (researcher's notes); and observations of the student process (researcher's notes). For the design for development project of 2020, the sources of evidence are: the student process documentations (documents submitted digitally); student reflection documents (documents submitted digitally); final student prototypes (submitted

digitally); personal teaching observations (researcher's notes); and observations of the student process (researcher's notes). The class consultations recorded during the project in 2020 (transcribed using Otter.ai as a platform) were used to supplement the data, as well as to gain insights shared by project facilitators from the data.

According to Elo and Kyngäs (2008:108), qualitative content analysis helps the researcher to enhance understanding of the data by making it possible to filter words into fewer, manageable, content-related categories. This is echoed by Kolbacher (2006), who explains that qualitative content analysis helps the researcher to "deal with complexity and gradually reduce it". Kolbacher (2006) also argues that the iterative approach to analysis in qualitative content analysis "fits the credo of case study research: helping to understand complex social phenomena". The steps followed in qualitative content analysis for this research are in line with an inductive approach outlined by Elo and Kyngäs (2008:108), where specific, individual observations are steadily synthesised to arrive at general conclusions from the body of evidence. To begin the qualitative content analysis, the researcher familiarises themselves with the body of data under observation, by reading through the content multiple times. Following this, a process of open coding begins, where notes and headings are written in the margins of text while reading through the material. Once this process has been repeated so that all key headings have been identified, the headings are collected from the margins and transferred to coding sheets. After open coding, the lists of categories can be grouped under higher order headings to organise the information. Creating categories in this way aids better description of a phenomenon, increases understanding and generates knowledge (Elo & Kyngäs 2008:111). The axiological position of the researcher is an important consideration in this kind of analysis, as the researcher comes to a decision about how to categorise data based on their interpretation. After categories have been created, a process of abstraction begins, where each category is named using content-characteristic words, and sub-headings are grouped into broader categories. This process of abstraction continues until no new categories emerge and the researcher is satisfied that all terms have been grouped appropriately (Elo & Kyngäs 2008:111).

Figure 19: Multiple case research design and research steps. Adapted from Yin (2018:47) and Elo and Kyngäs (2008:110).

When the process of qualitative content analysis is complete, a case description is written for each case under observation, highlighting the holistic findings of that individual case. Once this process has been completed for both cases, a cross-case synthesis can be done (Yin 2018:196) across the cases. While conducting the cross-case synthesis, the aim is to search for within-case patterns across the two cases, as well as points of difference. A conceptual approach (recommended by Yin 2018:197) is followed when conducting the cross-case synthesis, in keeping with the holistic nature of case study research. A discussion of the findings follows the cross-case synthesis.

4.4 Ethical considerations

The approach to research ethics taken in this study aligns with Tutty *et al.'s* (1996) (in Strydom 2002:63) suggestion that research should strive for egalitarian relationships between researcher and participant. As such, respondents (or research participants) may be regarded as "co-researchers" (Tutty *et al*. 1996 in Strydom 2002:63). Obtaining informed consent from research participants is a critical step in following ethical research procedures. Strydom (2002:65) suggests that information provided to research participants must be accurate, complete and allow participants to form a thorough understanding of the research process. As a result, research participants will be able to make "a voluntary, thoroughly reasoned decision about their possible participation" (Strydom 2002:63). Although the proposed research is a retrospective study, focused on the cases of the 2019 and 2020 Design for Development project, informed consent was given by participating students in both year groups prior to their participation in the project. In addition, specific consent was also given by all participants for their participation in this research study. In addition to the consent of the students, informed consent was also obtained from all co-facilitators of the project in order to include their insights as recorded in the classroom consultations (2020)[27].

Ethical decisions made in preparation for this study are aligned with Beauchamp and Childress's (in Dhai & McQuoid-Mason 2011:14-15) four principles of ethical inquiry, namely: respect for autonomy, non-maleficence, beneficence, and justice. With regard to respect for autonomy, research participants gave voluntary consent to participate in the

[27] All completed consent forms are available on request. An example of the letter of consent given to students is included in Appendix C.

study. As students are obliged to complete the project as a curriculum requirement, it was made clear to them that opting not to participate in the research study would not impact on their project experience or assessment in any way. To safeguard fairness in the assessment of student projects, projects were assessed by four lecturers: the two main project facilitators as well as Ms Megan Ribbens and Dr Karen van Zijl, who provided additional facilitation during the project. Ms Ribbens and Dr van Zijl were unaware of which students had consented to participate in the research at the time of assessment. Students were thus treated respectfully as co-participants in the research process and could also choose to remain anonymous. Students could indicate whether or not they wished to be acknowledged should visual examples of their work be shown. All data gathered from the study is kept confidential. Concerning non-maleficence, participation in the study posed no foreseeable harm to students. Instead, the research aims to act in the best interest of participants (Dhai & (Dhai & McQuoid-Mason, 2011:14), following the principle of beneficence. Benefits that may result from the research study include improved curriculum development and a better understanding of student learning experiences. With regard to beneficence on the part of the students; students benefited from the modelling of ethical behaviour by the facilitators as well as the fact that they had to receive assent from the participants themselves and consent from the parents of the participants. Regarding the principle of justice, which emphasises the fair allocation of resources (Dhai & McQuoid-Mason, 2011:15), all students were given equal opportunity to participate in the research study and all data gathered from students are considered equally valuable. As the proposed research is centred around a curriculum-based project in the BA Information Design programme, a letter of consent is also included (in Appendix D) from Professor Lize Kriel, chair of Visual Arts, indicating consent to conduct research themed around the projects. During the Design for Development project of 2020, guidelines were outlined by the South African government regarding social distancing and safe interaction with others in the context of the COVID-19 pandemic. As such, students were aware that they needed to operate within these guidelines, and acted responsibly when conducting their research with participants.

In Chapter Four, the case study research methodology selected for this study is explained. In particular, the use of a collective case study, and the unique attributes of this methodology, is described. This chapter also outlines the axiological, epistemological and ontological stance taken by the researcher while conducting this study. Following this, the sources of evidence gathered for the study is detailed, and the methods of analysis (being cross-case analysis and qualitative content analysis) are explained with regard to how they

are applied in this study. This chapter also pays attention to how validity and reliability are ensured through the research process. Lastly, the manner in which research ethics informed procedures followed in the study, is explained. Chapter Five marks the beginning of the empirical analysis, where data from each case study is analysed following a qualitative content analysis method. Following the qualitative content analysis for all sources of evidence from both case studies, a case description is written for each respective case, in keeping with Yin's (2018:47) recommendation for conducting a collective case study. Chapter Six contains the cross-case synthesis, as well as a discussion of findings from both case studies.

CHAPTER FIVE:
EMPIRICAL EVIDENCE FROM THE CASES

The previous chapter outlined the research design for this study. A recap of the research question was followed by a discussion of the research paradigm, research methodology and methods selected for the study. Working within a constructivist research paradigm, the study employs a collective case study methodology to answer the main research question. The units of analysis comprise the respective Design for Development projects of 2019 and 2020, and each case is analysed individually, by means of qualitative content analysis. Chapter Five thus presents the empirical evidence from the respective case studies by describing the qualitative content analysis conducted for each case, as well as concluding each case with a discussion of the empirical findings. The decision to analyse each case study separately is in line with Yin's (2018) suggestion that, in a collective case study, each case must be considered individually before arriving at a synthesis of the cases. The process I followed stayed true to this method, as the Design for Development project of 2019 was analysed in its entirety before I started to analyse the subsequent projects of 2020.

As qualitative content analysis (QCA) is the method used to analyse both cases, this section provides information on how the process was approached. As explained by Margrit Schreier (2012:2), QCA is an appropriate tool to use when some form of interpretation is required in data analysis. As this study is qualitative and constructivist in nature, interpretation of the findings is central to answering the research question. In addition, Schreier (2020:4) states that with QCA the research question determines the lens through which analysis of the data takes place. As such, when designing a coding frame, the initial research question forms a starting point to determine the relevance or irrelevance of the data to be included in the study. As mentioned in Chapter Four, this study aims to answer the following question: how does introducing play in the context of design higher education influence students' design process?

According to Ho (2020), when creating coding frames in qualitative analysis, one can make use of either deductive or inductive strategies, or a combination of the two. A deductive strategy makes use of a theoretical framework, hypothesis or existing knowledge to generate codes, where data is then organised to fit this coding frame. Conversely, with an inductive approach, the coding framework is generated from the data, with no preconceived categories in the coding frame. Schreier (2012:89) refers to these methods as

concept-driven (deductive) and data-driven (inductive) strategies. A suggested approach in QCA is to combine both concept-driven and data-driven approaches to design the coding frame. In this way, the research question and theoretical framework can help to establish a broad set of codes and sub-categories can emerge from the data (Schreier 2012; Ho 2020; Elo & Kyngäs 2008). The strategy I followed for the QCA is thus based on this recommendation. Initially, the data gathered is considered through the lens of the research question, with three overlapping areas of inquiry, namely: introducing play, the student design process and design higher education. Thereafter, codes are generated as they emerge from the data. Once a coding frame has been established, this frame is tested with the data and modified as necessary, to ensure reliability and validity (Schreier 2012:35). I elected to conduct the process of coding by hand, for two reasons. The first is that the variety of evidence produced by the case studies varied greatly in format, including hand-written reflections by students, transcriptions of class consultations, physical process work as well as digital deliverables.[28] The second reason is that I wanted to be able to provide a rich analysis of the data, and to immerse myself in the data before beginning with the analysis. This is both in-keeping with the constructivist approach adopted in this study, where the subjective position of the researcher is acknowledged, and with my pedagogic approach as a reflective practitioner (Schön 1983). Because of my close involvement with both cases, as co-facilitator, engaging with the data by hand allowed me to reflect on-action on the process followed by the students. For both cases, I followed the same sequence of steps in conducting the QCA, informed by Schreier (2012), and Elo and Kyngäs (2008). First, I read through the data compiled in the case documentation thoroughly, before re-reading and making line-by-line notes (an example is shown in Table 7 below). These notes helped to build the initial structure for my coding frame. Following this, I allowed further sub-categories in the coding frame to emerge from the data. During the coding process, I mostly made use of in vivo codes[29] or process codes[30] when analysing student reflections. When analysing sections related to project process, I mostly made use of descriptive and process codes. The sub-categories were regrouped, edited and organised as the coding process continued, before finally being grouped into themes for each case. Themes are explained by providing quotes from the data, as well as

[28] Evidence from both cases is included in a case documentation, Appendix B, that accompanies this study.
[29] In vivo codes are used with the goal to capture the experience of the research participant by remaining as close to the data as possible. This is done by using short phrases or words taken verbatim from participant responses (Ho 2020).
[30] Process codes were used when describing a part of the design process, or an action that occurred during either of the case studies. These process codes are usually verbs.

demonstrating how the theme showed up in each particular case. As mentioned previously, Chapter Six comprises the synthesis and cross-case analysis of this study.

EXAMPLE OF LINE-BY-LINE CODING: AN EXCERPT FROM A STUDENT REFLECTION QUESTIONNAIRE	
Give a brief account of your experience of the prototyping phase of the project. What were the highlights/ challenges? It was a daunting thought at first but it turned out to be extremely valuable to see how the children interacted with the games. They were quite excited to be "guinea pigs" for this project. They were very vocal about the aspects they enjoyed and the aspects they weren't so keen on. I received feedback on the appearance of the characters as well as the type and amount of text being used for the game. Prototyping also helped me learn how to explain and direct the game-play process.	Initially daunting Realising value in process Exciting to engage with kids Listening to kids Understanding preferences Refining characters Refining instructions Refining game play
Would you implement this style of problem solving/ approach again for future projects? Please elaborate. I definitely see the value of the prototyping process, particularly its use in designing for others. This process helps you design with the end-user; they get to be part of the meaning-making by having a say in the designs. You get to observe unexpected behaviours and reactions, you get to conduct first-hand research through conversations with the user and it's also a really fun process if the participants are keen. Collaborating with the users and with different professionals from different fields help create a richer, meaningful solution.	Valuing process Understanding human-centered design Making meaning with user Listening to needs of user Being surprised by reactions of users Having conversations Having fun through the process Collaborating to gain insight Crossing inter-disciplinary boundaries Creating meaningful solutions

Table 7: Example of line-by-line coding

Specific details on the units of data collection are unpacked in the previous chapter, in Table 6. For navigation purposes, it is worth explaining the referencing system used to refer to the data in text. Student process documentations are referred to by project name and year; this is because project documentations remain largely project-specific and do not contain individual student insights. When discussing a student project, the work is referred to by the name of the project and the year, for example *Foe Fiction* (2020). Student reflection documents are referenced by the assigned student number, followed by the project year, for instance: S4'19. The transcribed consultation recordings of 2020 are referenced according to the person speaking, followed by the year. This means that when a student is cited, the reference would read S4'20; when a facilitator is cited the reference

would read F2'20. Although most students elected to have their names mentioned when showcasing visual examples of their work, I have chosen to keep responses in their reflections, as well as the recorded consultations, anonymous to limit individual bias in the research interpretation, as well as to respect the privacy of their opinions.

5.1 Presentation of findings from the Design for Development project of 2019

The previous section detailed the process followed when conducting the QCA for this study. In this section, I begin by discussing the findings from the student process documentations of 2019. Next, I discuss themes identified through the QCA of the students' guided reflection questionnaires.

During the Design for Development project of 2019, contact classes were still the norm. As such, the project kicked off with an in-person briefing session for the entire group of students. The briefing session lasted roughly an hour, and was followed by a play workshop presented by Dr Karen van Zijl, a registered Child Life specialist and practicing play therapist, as well as Ms Megan Ribbens, a foundation phase educator and registered Child Life specialist. The play workshop included a presentation on the developmental stages of children in the age range students were designing for, namely 8-12 years of age. In addition, various play stations were set-up in class and available for students to interact with. These stations featured types of play that were developmentally appropriate to children in the age range, including free play, dramatised play, biblioplay, creative play, physical play and mastery play[31]. Students were given information about each kind of play, before being allowed to engage with these stations in their groups, and to experience the play first-hand[32]. Following the play workshops, students spent time in their groups to

[31] Free play refers to play where children are in control and have free reign to decide what to play with, and direct the play trajectory and plot themselves (UNICEF 2022). Dramatised play entails imaginary play, pretend play or role-playing and can be engaged in as solitary play or play with others (Biddle *et al* 2014:268). Bibilioplay, in the context of this study, is play that harnesses principles of bibiliotherapy (Heath *et al* 2017) with the addition of broader play elements. Creative play encourages the imaginary possibilities of play, where children can explore new configurations through tinkering and experimentation (Biddle *et al* 2014:272). Physical play includes play in which a child is engaged in some physical activity, which could be geared toward developing gross or fine-motor skills and coordination (Biddle *et al* 2014:271). According to Hughes (2023), mastery play denotes control over physical and affective elements of the child's environment, and includes skill-building activities, such as building a dam in a steam.

[32] The experiential element of the play workshop gave rise to some personal reflections by students that are discussed in more detail later in this chapter.

discuss preliminary ideas for their project. They also had the opportunity to ask specific questions related to their ideas after the play workshops. As part of the project deliverables, students were required to collectively document the process followed by their group during the project. Students were also given a guided reflection document, that they were required to complete throughout the project, encouraging them to reflect in- and on-action.

5.1.1 Project process

As a detailed picture of the student process is key to answering the research question of this study, the student process documentations comprise the first set of data to be analysed. This is also in line with meeting one of the research objectives of this study, namely to explore and describe what is unique about the Information Design student design process, when compared to the widely adopted 'iterative design process'. This section begins by illustrating the students' process by means of a visual summary as seen in Figure 20. Next, students' insights are shared from the primary research and play testing phases. Lastly, insights from students regarding their interactions with project facilitators are shared, as well as their comments on access to resources. These resources include access to families to interview, access to in-person contact with peers, and physical resources made difficult to access owing to the context of the pandemic.

To analyse the process documentations, I followed the same approach outlined above to conduct the QCA. After reading through the material twice, I summarised the process followed by each group by pulling key words from their documentation. These key words often served as signifiers of various stages in the process, and sometimes functioned more as descriptions of these phases. A first observation is that the same general structure was followed by most groups, but that some groups showed evidence of a much more expansive project process than others. In particular, there were obvious differences in the initial amount of research conducted by groups. In certain instances, research exploration was very expansive, considering multiple themes and angles, where some groups chose to narrow their focus early on and conducted more targeted research to suit their particular

theme. It is also noteworthy that the groups who engaged in a wider initial exploration tended to have more cohesive, considered and polished design outcomes.[33]

Figure 20 illustrates the phases in the process by making use of a series of widening and narrowing circles, illustrating the extent to which the student cohort of 2019 engaged with each phase. The process overall was very fluid in that there was often not a distinct break between each phase; the overlapping circles demonstrate this interconnectivity. The students had four weeks to complete their projects after the play workshop and briefing. Roughly, the first week was spent conducting initial research. This phase included brainstorming, sharing ideas amongst team members and gathering preliminary information based on their chosen topic, childhood development, as well as their chosen design principle. Once the initial exploration had been done, students interpreted the information and made decisions about how to include the findings in their design solution. At this point, students consulted with the project facilitators (indicated in turquoise in Figure 20) to get feedback on their ideas and research. Often, students elected to consult with additional experts that could provide insights on their chosen topic, like speech therapists, teachers, parents and play therapists. These connections were organised by the students themselves and proved fruitful in providing insight, inspiration and validation for their ideas.

From the analysis of the students' process documentations, as well as the reflection documents, it is clear that the play testing sessions were motivating and inspiring for the students. This is discussed in more detail in the next section, but from a process perspective, it is worth noting that the play testing phase spurred students on and motivated them to refine their projects. Students reported feeling more energised, inspired and validated when seeing children engaging with their design work. The play testing sessions were usually followed by reflections amongst the groups, where they discussed changes to be made to their design deliverables. Subsequently, students refined their designs and presented these iterations to the project facilitators. In most instances, students also engaged in a second or third round of play testing with children, where this process of engagement and refinement was repeated.

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[33] For example, the toolkits *Going Overboard* (2019) and *Foe Fiction* (2019), as well as *Bond* (2020), *Bopper* (2020) and *BugBox* (2020) demonstrate that broad initial exploration, as well as intensive process documentation and design iterations, informed the rigor and ultimate success of their projects by means of producing appropriate, human-centred and playful design innovations.

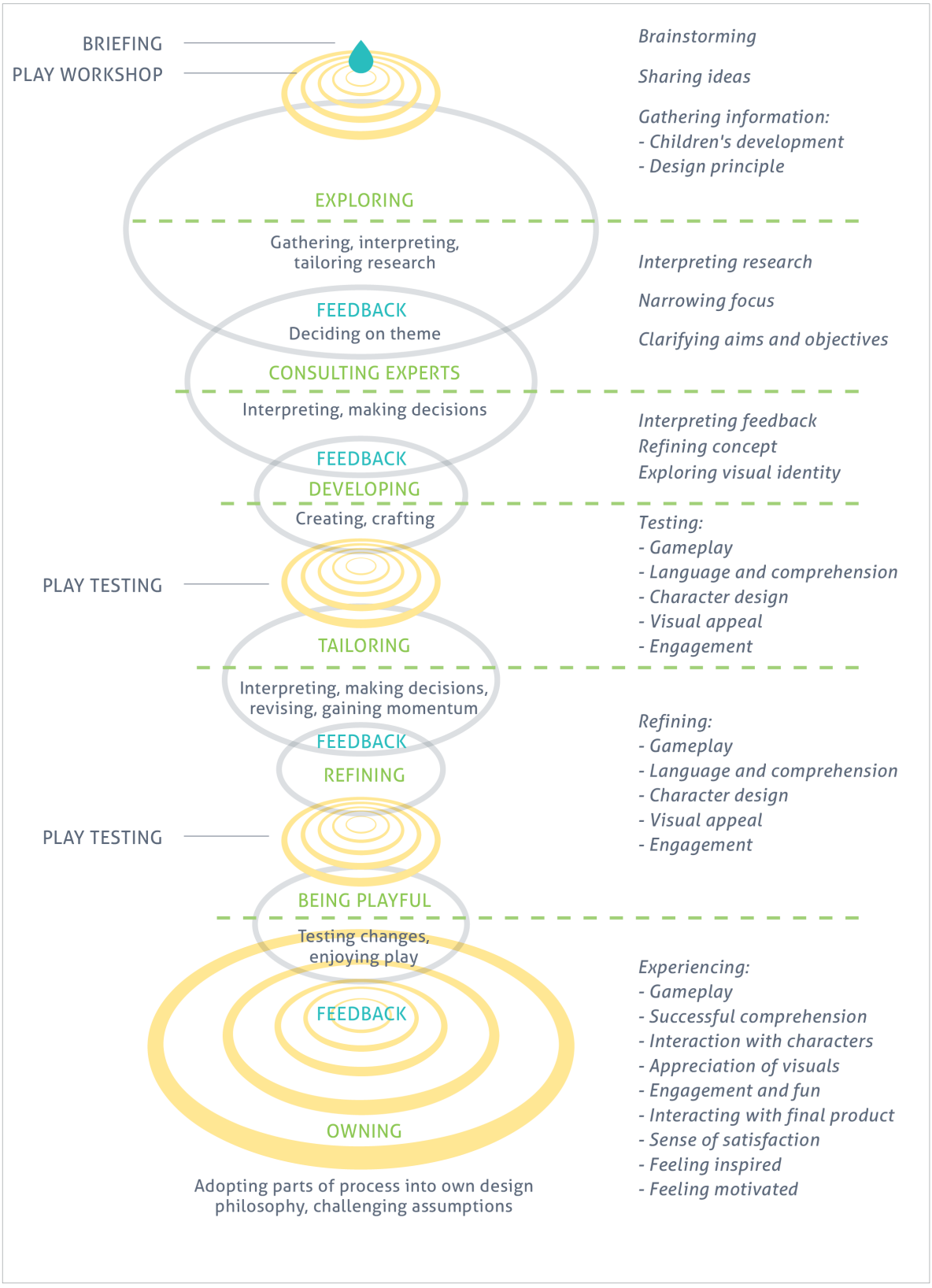

Figure 20: Student project process diagram from the case of 2019

During the latter feedback sessions of the project, students mostly used their consultation time with the facilitators to showcase their progress, discuss refinements made based on feedback from play testing, and to ask questions related to project hand-in requirements. In addition, students asked for direction regarding what was expected for their final project presentation. What became apparent through the analysis, is that students exhibited a great sense of ownership and satisfaction of their designs by the end of their project, and particularly in the final project presentations. Insights from the student process documentations that relate to conducting primary research and play testing follow.

5.1.2 Insights from the primary research phase

After the project briefing, students engaged in both secondary and primary research to refine their concepts and help them to settle on a theme for their projects. A couple of groups elected to spend time in spaces such as toy stores or book stores, that would be frequented by children and parents, to get an idea of how children's designs were pitched and packaged. For example, the *Foe Fiction* (2019:22) group articulated their insights from their primary research as follows:

> As a group we headed to Brooklyn Mall to visit Exclusive Books, the Brooklyn Public Library and Toy Kingdom store. The aim of this expedition was to identify inspiration for our own visual style, as well as identifying how the games and books are marketed to children between the age range of 8-12. We paid particular attention to the visual tone and the type of language used to speak to the target market. It was a refreshing experience to go out into the public and explore these spaces. We sat in the children's section of the library, paging through the story books and engaging with the visuals and content from the perspective of a design student and from the imagined perspective of a child. The toy shop was just as exciting to venture through. Here, we took particular notice of the packaging design of the games. We observed and interacted with different toys, noting their functionality and overall design. It became clear to us that our visuals were going to need to be particularly strong to "compete" with the published games and children's literature available already.

A theme that emerged from this reflection, as well as students' reflections after attending the play workshop, was that they felt simultaneously excited and daunted by the task of designing a game for children. In particular, students commented on the high standards of design in children's games and books and felt pressurised to produce design objects of a similar standard. Many students noted that the books provided at the play workshop proved a great source of inspiration for their toolkits, and that they enjoyed seeing how lessons were embedded in the narratives.

As part of their primary research, many groups chose to speak to experts in the field related to their topic. For example, many spoke to parents and teachers, while some identified particular experts such as speech, occupational or play therapists to interview. The *Going Overboard* (2019:194) group interviewed an occupational therapist that gave them insights on the importance of sensory integration, particularly to help children with emotional regulation. This feedback guided the theme that they chose for their toolkit as shown in Figure 21.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
GOING OVERBOARD	**EMOTIONAL REGULATION**	**BALANCE**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, MASTERY PLAY, SENSORY PLAY, DRAMATISED PLAY**	

SUMMARY

Going Overboard is a toolkit that emphasises the importance of balance when it comes to emotional regulation. Children are guided through a nautical adventure while they learn how to navigate the world of emotions, through biblioplay, an expressive dramatised play activity, as well as physical play activity, similar to Twister, that builds emotional vocabulary. A board game illustrates that space can be held for different emotional states in a fun and interactive way.

Figure 21: Going Overboard *overview, 2019*

5.1.3 Insights from the play testing phase

From a process perspective[34], the play testing phase proved beneficial to students in that it provided valuable insights on game play. This relates particularly to pace, engagement and

[34] This section discusses insights on the play testing phase from a process perspective, highlighting the practical implications of play testing for students. Student experiences of play testing is discussed in more detail in the following section.

enjoyment of the game play, as well as testing comprehension of instructions and stories. Play testing also provided an opportunity for students to link theory and practice, both with regard to play theory and design theory. Often, students also reported being surprised by the children's' competency in game play and understanding instructions. In addition to this, students were surprised by the potential of the games they designed to develop skills not initially intended by them. For example, the *MoonWhizz* (2019:937) group shared the following account of their play testing session:

> During gameplay children exhibited interesting behaviour that deviated from our expectation. The first is particularly related to the children's initial interactions with the game. We anticipated a controlled and carefully measured environment when in fact the bright colours and detail of each game lead to increased curiosity from players. The exhibited curiosity led to extroverted interaction in which players wanted to share their discovery with other players – often players playing a different game. Players found themselves challenged by the various levels of each game and we found increased difficulty levels to be a great incentive to finish the task at hand. Players also exhibited an increase in conflict resolution which we did not anticipate in this analytically focused game. Because of the interaction, the games invite interpersonal skills which were naturally tested and measured.

As mentioned above, the play testing sessions enabled students to make links between theory and practice. For example, in their documentation of their play testing session, the *Wait a Minute* group (2019:1149) describes how their new knowledge of Piaget's (1947) concrete operational phase, covered during the play workshop in class, was demonstrated by the children during play:

> A Plant's life activity – The groups of children did not have prior experience of planting seeds. They were enthusiastic about learning something new and embraced the learning process. They were inquisitive and excited to see how the plant would grow. The children all enjoyed getting their hands dirty with the soil and water. From the play presentation we learned that ages from seven to eleven are in their concrete operational phase, this means that logical thinking develops, but only applied to concrete objects and abstract thinking is not developed yet. The children's concrete operational phase was evident in that they took much longer to try and draw what the plant would look like once it was fully grown, which teaches abstract thinking. The children were very enthusiastic about the tangible things they could see and experience. This was evident in how they wanted to throw more and more water on the plant expectantly waiting to see it grow immediately.

Students noticed the potential that play has to challenge assumptions – both their own and those of the children. An anecdote from the *Taste Buddies* (2019:1090) illustrates this:

> This was an extremely fun activity to prototype, as it was a very creative and hands-on activity. We prototyped the recipe "apple sarmies" which consist of cutting apples into slices, and smearing them with peanut butter and then sprinkling muesli and raisins on top of it. We chose this specific recipe to

> prototype, as it is not your usual snack. Initially, the children did not think it would taste as good, one girl even said she hates peanut butter (she changed her mind right after tasting the apple sarmie!) The children proved themselves very competent in the kitchen and the activity proved to be very successful.

Earlier in their documentation, the *Taste Buddies* (2019:1090) group mentions that they were unsure of how children would handle themselves in the kitchen during play testing. From the excerpt, it becomes evident that the competency level of the children exceeded their expectations, and that through play, the children's' assumptions were also challenged in that they tried a food they previously disliked.

5.1.4 Students' experiences with project facilitators and access to resources

As illustrated in the process diagram (Figure 20), there are certain points in the project process where involvement from project facilitators comes to the forefront. These include the briefing session and subsequent play workshop, as well as the opportunities for feedback that are built into the project schedule. The following insights regarding facilitator involvement were gleaned from the students' research documentations:

- Lecturer feedback proved valuable, both with regard to refining the practical and visual aspects of their games.
- Feedback from the play experts proved valuable in refining the game play so that it is developmentally appropriate for the target audience.
- Resources recommended by both lecturers and play experts were beneficial to students.
- Feedback sessions with both lecturers and play experts helped to refine the language use in their toolkits, as well as to craft the narratives and visuals.

The issue of access to human resources, in particular children and parents, to interview and involve during play testing, is something that was mentioned repeatedly in the student process documentations. Although all groups managed to play test their toolkits, many groups reported some difficulty in organising these sessions, and noted that they would have liked to test their games more often. Students noted that speaking to parents helped them to understand parenting challenges, and validated the need for their toolkits. Speaking to teachers gave students insights from a schooling context, highlighting popular games that children like to play and challenges they may face in the classroom. Students also benefitted from observing the way in which teachers interact with the children in their class, remarking that the teachers are animated in their interactions. During the play testing

sessions that took place in a formal school environment, teachers helped students by suggesting revisions for game play, as well as by validating the need for their toolkits. The interactions with children during the play testing sessions were a highlight for most students, and this is covered in more detail in the following section, based on the analysis of student reflections.

5.1.5 Themes emerging from student reflections

The themes discussed in this section are gathered from the QCA of guided reflection questionnaires, completed by students during and after the Design for Development project of 2019. The questionnaire was divided into three sections, with the aim of understanding students' experiences of the play workshop, the design process, team work and collaboration, as well as to gauge whether they found that the inclusion of play in the project added value to their own design process. At the time of compiling the questionnaire, the intent was to gather the information to improve teaching and learning, as well as to understand more about students' experience of play. In addition, the pedagogic aims behind the reflection questionnaire were to help students develop critical thinking skills; generate insights related to design practice; and practice internal dialogue skills. The reflection questionnaire also served as a "reflective probe", as per Loi's (2007:235) conceptualisation of the term. As noted in Chapter Two of this study, Loi (2007:236) explains that reflective probes enable reflective practice, and that these probes should be kept contextual and tailored to a specific purpose. The act of reflecting and examining one's own experiences encourages perspective taking (Loi 2007:236) and aids deep learning. Deep learning is framed by the Lego Foundation (2018:9) as learning that enables us to connect theory and practice; this is experiential learning where factual knowledge is deepened by seeing knowledge applied in action.

The data gathered here is grouped into categories based on the experiences of the students. This is done with the view to meeting one of the objectives of this study, which is to explore and describe how students experienced play as part of their own design process. Student reflections are supplemented with my own teaching observations, while taking note of my own researchers' bias, as suggested by Cresswell and Poth (2016:386). Some of the themes have overlapping components or are considered from multiple perspectives; these are included to add depth and richness to the descriptions (Cresswell & Poth 2016:386). In line with the strategy followed for QCA (Schreier 2012), quotes from the student reflection documents are included and discussed in prose to describe and

substantiate each theme. In the organising and editing of these student reflections, I am aware that I am constructing a reality coloured by my own experience and involvement with the projects and students. Although this approach is fitting within a constructivist research paradigm, reflexivity on the part of the researcher remains important to improve the validity of the study (Cresswell & Poth 2016:386). As such, during the coding process, I needed to remind myself of my own biases, whether informed by past interactions with students, or prior experience of teaching this project. It was helpful during the project to reflect with my colleagues on the progress of the students, as well as their engagement during class; these insights helped to inform a shared image of the project process from the facilitators' perspective. The themes I discuss below have been ordered loosely in line with the way they emerged during the project process, based on my teaching observations.

- *Feeling out of their comfort zone*

The first theme that became apparent from the student reflections, was a sense of initial hesitation or apprehension to engage in activities that deviated from their normal class routine. Firstly, some students noted that they were challenged by the idea of remembering how to play. For example, student S11'19 remarked about the experience of participating in the play workshop:

> [I was] apprehensive as I generally don't enjoy being out of my comfort zone. However, once I got into the swing of things, I enjoyed playing child-like games with my friends.

Although some students found the prospect of play daunting at first, most noted that they began to enjoy the session as it progressed. For example, student S13'19 noted:

> The most challenging part was getting comfortable with playing again. It was a strange experience as not many people get the opportunity to 'relive' the good old days of childhood.

During the play workshop, students rotated between different play stations, that each featured a particular type of play. A comment that cropped up often was that students felt uncomfortable during dramatised play or pretend play. Some remarked that this kind of play went against their introverted natures, while others felt afraid that they would embarrass themselves in front of their peers. Student S23'19 commented that the most challenging part of the play workshop was

> playing pretend, make believe. It was difficult to immerse myself into another world that is not too rigid.

Similarly, student S2'19 noted the following:

> I found dramatised play the most challenging to engage with which is interesting because as a child it was definitely my favourite. I struggled to find a way to appropriate the props to a more age-appropriate form of dramatised play.

Another aspect that students found overwhelming, was to choose between the many play options, and resources, made available to them during the play workshop. Some students also felt under pressure to choose the most appropriate item to play with. Student S3'19 remarked that:

> During the play workshop I set myself into the mindset of being open to learn. At some points it was fun and during others it felt a bit uncomfortable. This would happen when I wasn't entirely sure what to do or even how to get back into the mindset of playing.

Feeling pressure to choose the best kinds of play, in order to extract the most useful information for their projects, is demonstrated by the following students who said that they were challenged by:

> Being a little overwhelmed. This is because of the amount of options and things to consider for our toolkit ideas. I was not sure at first where to begin (S8'19).

> Having to choose between ALL the games was quite difficult as we weren't quite sure of the direction we wanted to go in just yet and we were spoilt for choice (S9'19).

The fact that the Design for Development project had to be completed in groups, also caused uncertainty for some students. Student S9'19 noted that:

> This was the first time my group had worked together so I was a bit apprehensive at first. We didn't know what the group dynamics would be like or how we would communicate with each other so it was a bit uncertain.

Lastly, the idea of having to prototype or play test their designs with children, was initially a source of apprehension for many students. For example, S11'19 remarked that:

> It was extremely daunting testing our games as I was worried they wouldn't like them or enjoy them. It was a nerve wrecking process. However, given that our toolkit was received very well by the girls we tested on, it was highly rewarding.

- *Alleviating stress*

Many students remarked that the Design for Development project, particularly because of the inclusion of play, differed from their typical projects in that the atmosphere was a lot less pressured and stressful. This is attributed to the fact that the act of playing – in the play workshop as well as during play testing – served to alleviate stress for many students, but

also to the process-driven nature of the project. Because emphasis was placed on play and process, some students felt that they could focus more on exploration and had to worry less about academic performance. For instance, student S18'19 wrote:

> I felt like the lecturers were supporting us on our journey, rather than me trying to follow a non-existent rule book. This switch in my mind allowed me much more freedom and playfulness in my approach to design, realising that there isn't one "right answer." The end product (design) is based on the need of the user, in this case the children.

In a similar vein, but on the topic of prototyping, or play testing, student S2'19 noted that:

> The fact that the end aim of the toolkit was play, the prototyping was a lot less tense and easier to conduct with a casual and mistake-free atmosphere.

Many students commented that the act of playing during the play workshop was enjoyable and relaxing. Student S2'19 and S7'19's reflections speak to this point:

> During the workshop I felt relaxed and easy going because there weren't any set objectives other than exploring and experimenting [with] different kinds of play (S2'19).

> During the play workshop I felt happy and relaxed. I didn't think about the small things that were bothering me about my life at that moment or the tedious chores awaiting me later that day. I felt focused and peaceful all at once (S7'19).

Some students remarked that the playful nature of the project, as well as the act of playing, helped them to be freer in their creative approach. Student S20'19 wrote:

> I learned that play is not only fun, but is an essential tool in a child's development and a great tool for acquiring skills. I took play for granted and realized that it goes far beyond the fun aspect of it. By playing the games ourselves we opened up our creative juices and allowed it to flow freely again. Play inspired us and motivated us to create [our toolkit]. We learned that play can also be a tool through which parents can communicate better to their children. Play gave us the opportunity to learn how to have fun and relax. By playing there was not so much pressure for ideas, because the ideas came freely without any stress.

Although many students noted that they underestimated the difficulty of designing products for children, as well as the workload of the project, a theme that emerged was that the playful nature of the project made the work less daunting and more enjoyable. Student S22'19 reflected:

> Play also made the amount of work ahead less daunting as we could test our concepts in playful manners instead of the normal critical mindset that designers often find themselves in. A playful approach always lessens the stress involved and for me less stress means more meaningful work.

- *Being immersed in play*

During the play workshop, from the vantage point of a facilitator, I observed the energy in the room as students engaged in play. Initially, there was a sense of pause as students thought about how to engage in play. As the play sessions unfolded, however, the energy in the room mounted and it was evident that students were enjoying themselves and were immersed in play. This sentiment is echoed by the student reflections. Some students commented on the fact that they were completely immersed during play, in particular when engaged in types of play they especially enjoy.

For instance, student S5'19 said in response to the play workshop:

> Play has a way of cutting you off from the rest of the world.

Student S16'19 reflected on their experience of the play workshop by stating:

> As I was busy playing I was drawn into the game. It was almost like I was drawn into a new world and everything around me just disappeared, especially during the mastery play. With some of the other play methods I felt a bit more bored.

The theme of nostalgia and rediscovering play also emerged from the data. Student S20'19 remarked that:

> I was very excited when we started with the marshmallow and spaghetti tower. I felt nostalgic when I recognised some of the activities I used to enjoy when I was 8-12 years old. I realised that play makes learning fun and that when you play a game you don't even realise that you are acquiring a new skill.

Similarly, student S23'19 recalls their experience of play:

> It was somehow unfamiliar, although I played a lot as a child. It felt completely new, like a rediscovery.

The idea that being immersed in play aids focus also emerged in two ways from the data. Firstly, students noted that they were completely focused during the play workshop, and that fidgeting with playful objects, or even continuing to play during the lecture, improved their focus. Secondly, anecdotes from the students' play testing with the children revealed that the children could listen more closely to their stories while fidgeting or playing with objects. In addition to this, children were much more inclined to focus on the activities while engaged in play with the students. Student S6'19 recounted her experience during the play workshop:

> I was relaxed, giggly and giddy, and completely focused on the activity. I wasn't distracted, it made me partially forget where I was and all the stress I had.

While student S21'19 reflected on their experience of the team building play activity during the workshop:

> I was very entertained by building the tower with spaghetti and marshmallows. My group member and I found it easier to listen to what was being said during the workshop because we continued to build the tower even after the allocated time was up. The workshop also allowed us to explore the different types of play and to open our minds for the conceptualization process.

- *Building momentum*

The remark by student S21'19 that play enabled them to "open [their] minds for the conceptualisation process" is also related to the theme of building momentum, that emerged from the data. Many students remarked that the play workshop enabled them to explore more broadly and served as inspiration for their initial ideation and conceptualisation phase. This momentum is also evident in the analysis of the student process documentation, by the sheer volume of initial exploration done by students. While facilitating the projects, students' enthusiasm was also clear and they were eager to produce playful objects that could be enjoyed and meaningfully used by children. The second instance in which play helped to build momentum, or spark increased enthusiasm in students, was during their play testing sessions. Most students commented that these play sessions were highly enjoyable and rewarding, and that they particularly enjoyed seeing how children interact with their designs. Although, as mentioned above, some students were initially daunted by the idea of interacting with children, all commented that overall, they found the play testing sessions helpful and rewarding.

Students found the iterative nature of play testing and revising their designs rewarding as well. For example, student S2'19 noted that:

> Seeing someone who didn't design something interact with it opens a number of creative alley ways that would not have been considered before.

Similarly, student S5'19 noted:

> [This approach] is a more fluid approach it allows for changes and rethinking.

Student S24'19 commented on the fact that, simply by viewing their work in a different context during play testing, it became easier to evaluate what needed refinement:

> Overall, I really enjoyed the prototyping phase, it allowed me to see first-hand how our designs worked in real life. I found it interesting how almost immediately in a different context, I could spot errors or issues in our designs, even before the testing

> had begun. This was because I was forced to view the activities from the children's perspective. The highlights of the process was when I could see the excitement and genuine enjoyment of the children as they took part in the activities. It was extremely rewarding to see how they not only engaged in the activities but also actually learnt and challenged themselves in the process. This showed me that our games are actually beneficial.

The comment by student S24'19 that it was rewarding to see their designs manifest in real-life, was a theme that emerged often in the reflections. For instance, student S1'19 wrote:

> The highlight of the experience was when you saw the smiles on the children's faces and them enjoying themselves. As well as the confirmation that the concept of your toolkit is suitable for your target audience.

While student S18'19 reflected:

> The whole experience helped me to get the design process out of my head and into the real world. Seeing real people interact with physical versions of my / our designs gave the whole experience of design a whole new perspective for me. We're not just designing to get good marks.

Aside from being rewarding from a progress perspective, or as a form of validation, students also really enjoyed playing with the children. Students S5'19 and S7'19 noted that:

> The prototyping phase was one of the most fun phases of the project. The children enjoyed it and were very receptive to everything we did and said (S5'19).

> The highlight of the prototyping phase was seeing the children enjoy the games our group created and become immersed in their desire to successfully complete the games (S7'19).

Although working in a group presents many challenges, a theme that emerged from the data was that most students found that a positive group dynamic spurred them on, and served to build momentum in their design process. For example, student S9'19 noted:

> I loved how we bounced ideas off of each other which pushed them to develop further and further into ideas which we would not have conceptualised individually within the time frame.

- *Learning about oneself*

The opportunity to reflect about their experiences of play revealed some personal learning insights from students. Some students reflected about which kinds of play they found most enjoyable, while others realised, as mentioned above, that fidgeting or playing during class helps them to focus. For instance, student S6'19 reflected that:

> Playing with the playdough was so much fun and engaging – there are so many possibilities of what to make. It's creatively stimulating. I had trouble putting the playdough away, but having something to fidget with also made it easier to listen to what was being said.

Many students reported that they developed a renewed appreciation for play, and that they would like to make an effort to play more even after the project had been completed. For example, student S7'19 reflected:

> I still enjoy playing, even in a sort of more adultish way or just the regular "child's play". The workshop allowed me to remember play and be reminded of the importance of it throughout one's entire life. I also realized that I enjoy engaging in play during theory-based lessons as a way to focus my mind and direct it towards the lecturer's voice.

On their experience of the different types of play during the play workshop, student S1'19 remarked:

> The play workshop just confirmed how enjoyable play is for me especially the sensory play, musical instruments and playdough … for the mastery play I was much more focused and competitive, but with the creative play, I was relaxed, inspired and full of joy. In addition to the dramatized play, I was energetic and spirited. Lastly with the biblioplay especially the books I was fascinated by how beautiful they were done thus I felt much more tranquil.

Aside from reflecting on the types of play they found most enjoyable, some students reflected on their own natures and ways of working. For example, student S24'19 wrote:

> Another part of the play workshop I found challenging was curbing my competitive nature. Although I was definitely more relaxed and free creatively, I found that in the marshmallow tower activity and even some later games, I was still trying to do my utmost best and comparing my performance to others instead of just enjoying and learning from the experience.

- *Challenging assumptions*

What became clear from the analysis of the student reflection documents, is that student assumptions were challenged during the project process. First, many students reported being surprised by the level of aptitude and understanding of the children they engaged with. For example, student S6'19 noted:

> I underestimated the level of development and maturing in our target audience. Our initial designs were quite childish, we didn't realise it at first, but the illustrations were actually aimed at a much younger audience.
>
> I underestimated the difficulty of creating a fun and innovative game that is easy to understand. The process was much more difficult than I expected. As well as

> designing for children is much different than designing for adults as one cannot rely on assumptions and they are constantly challenged throughout our research and prototyping. Thus, you cannot make assumptions about children, because we are not young children and do not think like children. Also, it was easy to underestimate the intelligence of kids and misinterpret what they would find enjoyable.

Learning about the abilities and preferences of the children, through play, helped the students to refine their designs in line with solutions that were more developmentally appropriate and enjoyable. Student S9'19 wrote:

> For starters children in the age group the project was targeted at were a lot more intelligent than I had first thought, the complexity of the games that we needed to come up with needed to be something challenging enough for them to manage but also different and creative to keep them interested. Seeing the different development stages of children opened my eyes to the different ways that play can communicate and engage with children. The assumption of educational games not being as interesting as the 'fun' games also proved wrong because they were actually quite enjoyable, even to me who is a lot older than the target age they are designing for. Also all types of play are actually educational, even if they are created for recreational purposes because you are still learning lessons and communication skills while playing them.

The reflection above highlights another assumption challenged through the project process: the idea that, while learning through play, lessons need to be conveyed in explicit ways. Student S6'19 remarked:

> I assumed a lesson needs to be overt or obvious in order to teach a child something. I learned that seemingly simple activities or games can also teach something.

Students' understanding of play, as well as the role of play in children's development and learning, was also challenged during the project process. Student S9'19 noted:

> The play workshop opened me up to the endless possibilities of play and therefore while designing I didn't have any of my preconceptions which would have falsely influenced the design development. Therefore, we were able to ideate within the correct space of play and not a preconceived idea of play.

From a broader perspective, student S24'19 commented on her understanding and interaction with children:

> My whole view about childhood and how children grow up has also changed. I found that I have a much better understanding of the behaviour I have witnessed and a deeper appreciation for the growing up process. I have a good relationship with our tenant's children, often spending time with them alone and upon reflection I have realised in my attempts to reason or interact with them, I may have missed the mark or there may have been a miscommunication, simply because I misunderstood the reasons behind their actions.

- *Adapting their own design process*

Another theme that surfaced from the data, was the idea that students began to internalise parts of the project process, by expressing a desire to adopt new ways of thinking and doing into their own design practice. In many ways, this idea was strengthened by the fact that student assumptions, about children as their target audience and about play, were challenged during the project process. Student S9'19 reflected:

> The games showed me what it was like for a designer to communicate with children in 'their language'. Children have a much more imaginative and free way of thinking and therefore I had to move my mindset away from the usual design development that I would follow. The age group we were focusing on was 10-12 and they were actually more intelligent than we thought so games shouldn't appear 'childish' to them as they don't want to be treated like youngsters. But this has taught, not only with children but any target audience, that you need to see the world through their eyes in order to communicate the way that they see.

Insights gained through play, both with children and amongst themselves, encouraged some students to weave a more playful mode of working into their own design process. For instance, student S15'19 wrote:

> Play made the design process really fun in that as a group, we had to shift mental gears and step into the world of children – something we haven't done in a while. Play reminded me personally to be more curious about the world again; to suspend my disbeliefs for a moment and just freely think and engage with objects – and to ultimately, have some fun again.

Similarly, student S18'19 remarked:

> I was so happy to have my assumptions challenged by being immersed once again into the world of play. This time I really tried to take the message of play to heart. I also enjoyed the added section learning about the development of children. Since this workshop I have made an effort to be more playful in my design approach.

Student S15'19 commented that, aside from adopting a more playful attitude in her approach to design, the project ignited her interest in the field of working with children:

> Designing for children is actually an amazing field of work and I've taken a deep interest in play therapy. Part of me wants to graduate and teach children about art and design as there was something so stimulating and exciting about engaging with children in and outside the classroom. I'm really grateful for all that I've learnt and for the new "dream" I've got stirring around in my mind and heart and the moment.

5.1.6 Summary of empirical findings from the case of 2019

This section presents the findings from the QCA, of both the students' reflection documentation, as well as their written reflection questionnaires, for the 2019 cohort of Information Design students. An analysis of the process documentations made it possible to plot the trajectory of the 2019 students' process, illustrated in Figure 20. Insights that emerged from the analysis of student process documentations included:

- Groups benefitted from immersing themselves in children's literature, particularly during the initial, exploratory phase of the project. Children's books and existing games served as a source of inspiration, and the quality of designs were aspirational for students.
- Consulting with experts such as play therapists, speech and occupational therapists, as well as teachers, proved a valuable source of information for many groups.
- Play testing enabled students to challenge assumptions, and to see how children's assumptions could be challenged through play.
- The play sessions inspired students to improve their work, and it was rewarding to see their designs in a real-world application.
- The students enjoyed playing and interacting with the children.
- Play testing enabled students to make links between theory and practice. Students had the opportunity to see the knowledge gained from the play workshop, applied while playing with the children.

The insights from the student process documentations fit within the coding frame and themes that emerged from the QCA of the written reflection documents. Table 8 below summarises these themes and provides descriptors of how these themes emerged from the empirical data. To recap, the seven themes that emerged from the written student reflections were:

- Feeling out of their comfort zone;
- Alleviating stress;
- Being immersed in play;
- Building momentum;
- Learning about themselves;
- Challenging assumptions; and
- Adapting their own design process.

Feeling out of their comfort zone	Alleviating stress	Being immersed in play	Building momentum
Apprehensive to try something new Relearning how to play Overwhelmed by options Nervous about group work Daunting to work with children	Experiencing less academic pressure Change of pace and approach Less afraid to make mistakes Freeing creativity Less stress and more meaningful work	Forgetting everyday responsibilities Learning through play Rediscovering joy in play Improving focus	Exploring more broadly Validating their ideas Excited by children's reactions Iterations helped to improve work Rewarding process Real-world applications Support from group members
Learning about themselves	**Challenging assumptions**	**Adapting their own design process**	
Learning about play preferences Rediscovering joy in play Learning about own ways of working	Underestimating children's abilities Learning does not need to be overt Learning to relate to children differently	Internalising parts of process Meeting children in their world Igniting curiosity Becoming more playful Sparking new interests	

Table 8: Summary of findings from the Design for Development project of 2019.

5.2 Presentation of findings from the Design for Development project of 2020

This section of Chapter Five presents the findings from the QCA of the Design for Development projects of 2020. However, I acknowledge that, having already grouped the data for the case study of 2019 into a coding frame, means that the projects from 2020 were viewed through a lens that was more attuned to noticing those same themes in the data. Nevertheless, during the analysis, an effort was made to approach the Design for Development projects of 2020 as a holistic entity, as the QCA process was repeated in the same way as with the projects of 2019. In addition, I was mindful to notice findings in the case study of 2020 that were different to that of 2019. The rationale behind this is linked to the validation strategy discussed in Chapter Four, namely identifying pieces of disconfirming evidence (Cresswell & Poth 206; Yin 2018). Although points of difference between the case studies of 2019 and 2020 are discussed in detail in Chapter Six, being attentive to these differences formed part of my research analysis strategy. As with the case study of 2019, I started by analysing the student process documentations. Thereafter, I analysed the written reflection documents completed by students during and after the project.

5.2.1 Project process

Like with the student process documentations of 2019, I conducted the QCA by reading through the material a couple of times, after which I made a summary of each group's project process. This summary was done by pulling key words from each group's chronological process documentations; and is illustrated in Figure 26. As I mentioned earlier, the attempt in this section of the case documentation is to consider the projects of 2020 as a case in its own right. Hence, I reserve comments and comparisons between the two cases for the cross-case synthesis, which is presented in Chapter Six.

5.2.2 Completing the project in the context of the COVID-19 pandemic

The Design for Development project took place mid-2020, in the context of the COVID-19 pandemic. During a time of worldwide lockdowns and travel restrictions, students in South Africa were not allowed to attend on-campus lectures. As a result, the project format was adapted and all facilitation was moved online. The brief was also adapted. Students were tasked to design an app that would encourage connection within the family unit; between children and parents, between siblings; or between generations within a family. This shift was intended to address the need for connection at the height of the pandemic, and as an incentive to leverage play as a means to encourage connection, rather than simply increasing screen time. A particular challenge in this virtual realm was to present a play workshop that would enable a practical understanding of play for students, as well as allow them an opportunity to connect with peers and lecturers in the same way we had done in previous years. Expertly, Dr van Zijl and Ms Ribbens made the types of developmentally appropriate play[35] we usually present accessible in the digital realm, by searching for existing apps or games that enabled the same play experience. Students were given a list of app examples from each play category, and could download and play the games in their own time after the workshop. This approach proved very successful in encouraging experiential learning, as many students stated that they were pleasantly surprised by the kinds of play that could be enabled by a digital platform. Another consequence of limited face-to-face contact was that students faced greater difficulties with play testing their games. To the surprise of the facilitators, however, students proved enormously resourceful

[35] As a reminder, these types of play include free play, dramatised play, creative play, biblioplay, mastery play and sensory play.

and most groups could successfully engage with children, for both in-person and virtual play testing.

5.2.3 Adopting a research-led approach

At the onset of the project, teaching a play-based project fully online was a daunting prospect for us as facilitators. Because of our uncertainty with regard to students' resources at home, as well as their personal circumstances during the pandemic, we opted to place greater emphasis on the research component of the project. The resource-driven focus was stressed in the project brief and reiterated to students during the briefing session. During our virtual consults, we also advised students against deciding on a theme for their project too soon; this advice was provided in an effort to encourage students to meet the rigorous research requirements of the project. This emphasis on research meant that students engaged in primary research early on during the project process, either by conducting virtual interviews with experts, children, or parents, or by conducting surveys or questionnaires online. The platforms used by students to conduct this research included Facebook, Survey Monkey, Google Forms, as well as video conferencing on platforms like Zoom or Google Meets. During the initial phases of the project, students also spent time researching play-based apps and playing the games suggested during the play workshop. A couple of student groups also elected to organise in-person "play dates" with children, where they engaged in creative activities[36]. During these sessions, groups had not yet settled on a particular theme, but were still in an exploratory phase of the project. These kinds of informal play sessions provided valuable insights for students who arranged them, and proved motivating and inspiring for students. Figure 22 showcases creatures made by children while engaged in a creative play session arranged and led by students.

[36] Students were guided to operate legally within the protocols set out by the South African government with regard to restrictions in the context of the COVID-19 pandemic.

Figure 22: Example of creatures created by children during a creative play session with students, 2020.

As they became more settled on a particular theme, most students also conducted a competitor analysis of similar, existing apps. This meant that students also played those games to learn from their visual approach and game play strategies. Some students decided to build quick physical models to represent their virtual games to figure out game mechanics. Figure 23 below illustrates such an example from the *Overtone* (2020) project.

PROJECT NAME	PROJECT THEME
OVERTONE	**ENCOURAGING CONNECTION THROUGH A COLOUR HUNT**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, PHYSICAL PLAY**
SUMMARY	
Overtone encourages connection between children and their friends or family members, while engaging them off-screen by means of a colour hunt. Competitors search for colours strategically to build their coloured bases and to destroy an enemy base. Colours are captured via a phone camera; this also aims to instil mindfulness and connection to one's immediate environment.	

Figure 23: Example of Lego construction to test game play. Overtone*, 2019.*

5.2.4 Creating rapid prototypes

The final deliverable required in the project brief was a full user journey of the app students elected to design. This means that one function in the app had to be fully operational, and that the rest of the interface, although complete, did not need to be fully fleshed out to meet the requirements of the brief. Despite this, students surprised us by creating polished prototypes that communicated the intent and experience of their apps very comprehensively. As a first step, some groups chose to create paper prototypes to test ideas for their games with children. For example, the *Bug Box* (2020) group arranged a play session with children, where they tasked children with designing their ideal game, giving them blank paper screens and a collage prompt inspired by the art of Christoph Niemann (shown in Figure 24).

Figure 24: Example of apps designed by children during a play session. BugBox, 2020

An advantage of creating digital prototypes was that students could create basic wireframes that users could interact with very early on in the project process. As their designs were fleshed out visually, the prototypes could be populated to include the new visuals and subsequently re-tested. This enabled multiple iterations of play testing. Figure 25 below showcases prototype iterations from the project *Meco* (2020). In Figure 25, a first, second and third design iteration is shown, making the design development between the phases visible. The students in this particular group conducted four rounds of user testing, each time using a functional prototype. As student prototypes were designed to work on a phone or tablet, accessibility was made easier when sending them to children or parents to test. Students themselves could also easily test the early iterations of their prototypes

before labouring too much on refining their designs. During the later stages of the project, students could gather specific insights about their app, specifically with regard to navigation, comprehension, visual appeal and engagement. Some groups also elected to ask a facilitator other than themselves to test their app with the target audience, a process made much simpler because of the digital platform. Most groups elected to play test the final versions of their prototypes again (with children, once all iterations had been completed) and found this process highly rewarding.

PROJECT NAME	PROJECT THEME
MECO	**ENVIRONMENTAL CITIZENSHIP**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, OUTDOOR PLAY, PHYSICAL PLAY**

SUMMARY

Meco is a game that allows players to complete a set of challenges designed to increase environmental awareness and build the concept of environmental citizenship. Each challenge is designed to clean up and benefit the environment; intrinsic and extrinsic motivational tools are used to keep players engaged in the challenges and add to the enjoyment of the game.

Figure 25: Illustration of prototype design progression, Meco*, 2020.*

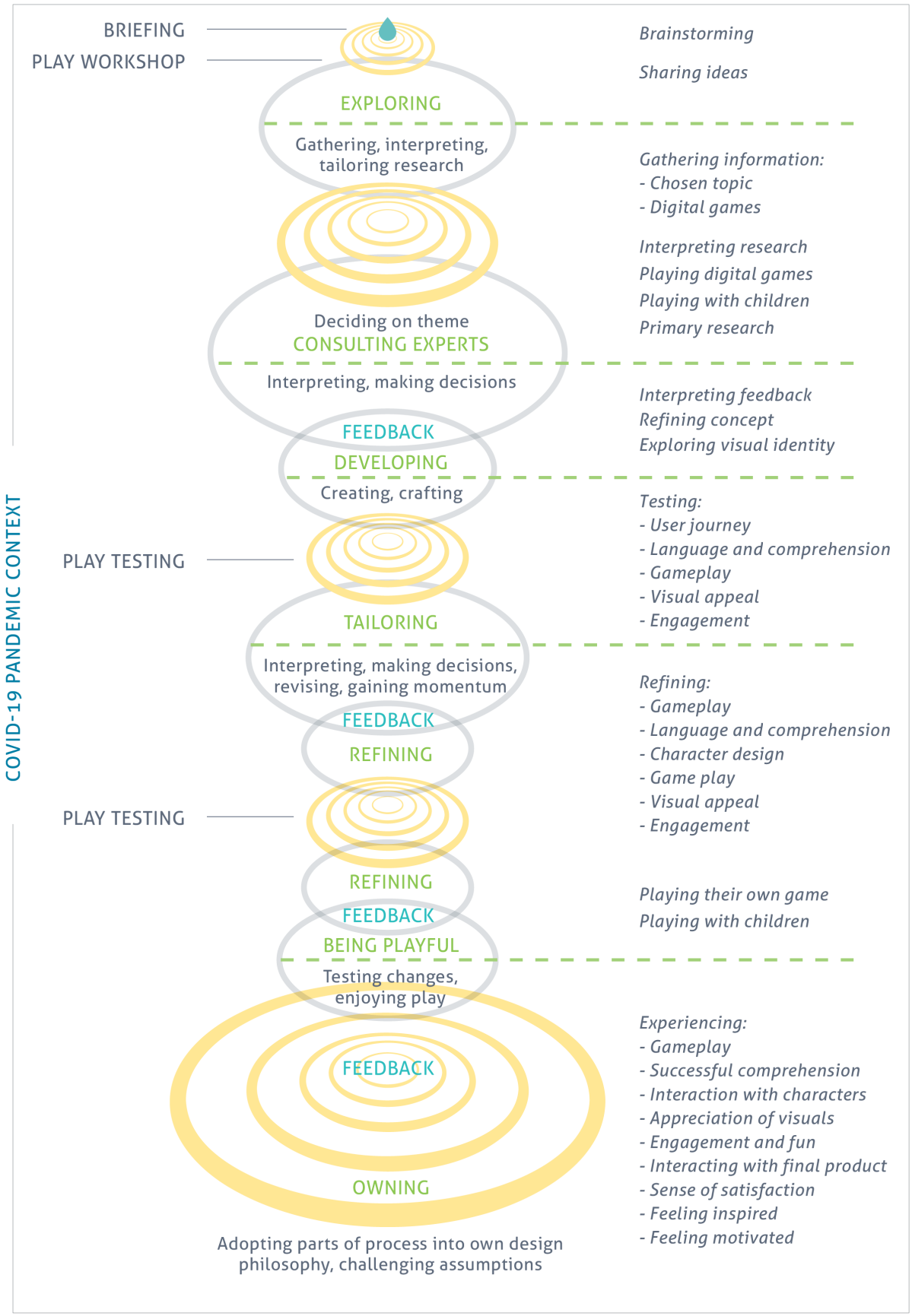

Figure 26: Student project process for the case of 2020.

5.2.5 Themes emerging from student reflections

The QCA of the students' written reflection documents revealed several themes, many of which are linked and overlap. Students' insights have been grouped conceptually, as suggested by Yin (2018). The following overarching concepts for each theme are discussed below: feeling apprehensive; relieving stress; longing for face-to-face connection; rethinking own design process; enabling empathy; and remembering to play.

- *Feeling apprehensive*

Many students reported an initial feeling of apprehension at the onset of the project. For some students, the idea of playing and working with children seemed foreign to them. Student S19'20 commented:

> Honestly, at first thought I was slightly intimidated by this whole project. I am not the biggest fan of children and I am not always sure how to interact with them. I assumed that letting out your inner child and playing would be viewed as immature/childish. It is commonly assumed that only children play and that adults should "act like adults". Play was quite intimidating because it is such a free, fun and spontaneous experience and the fear of being judged is in the back of your mind. It can be intimidating to let yourself loose and fully commit to the play experience.

The context of the COVID-19 pandemic also contributed to feelings of uncertainty for many students. This related both to the idea of collaborating with lecturers and team members in a purely virtual environment, as well as arranging interactions with children and parents in unprecedented circumstances. For example, student S1'20 noted:

> Participation in general was the most challenging as I had to step out of my comfort zone, after all the months of lockdown to now actually participate with people that I had not seen in months.

In the same vein, student S15'20 commented:

> At first, I was slightly nervous to contact the lady and ask them if they are willing to work with us, because due to the COVID circumstances, I didn't know how she would feel. Especially because it's a friend of a friend and not someone that I have ever met before. After the admin around the play testing was sorted, I was very excited, because I just love working with people in general and kids even more! I loved connecting with [the kids] in person and communicating with them. They were so excited to be a part of our research and it was an absolute joy to work with them. I got along with them so well and they felt comfortable to tell me when they are unsure or not fond of something. Although they were a bit shy at the beginning (the normal amount), they loosened up quickly and became very interactive.

The idea of finding children to collaborate with was stressful for many students, in part because of the COVID-19 context, but also because many students said they did not have much contact or interaction with smaller children. For instance, student S27'20 wrote:

> To come up with an initial idea and theme I found quite challenging, we did not have any sort of easy access to children of our target audience so we had to start off doing a lot of secondary research while we searched for children to take to for our primary research. Finding children for our primary research was definitely the hardest part. I also found the whole lockdown situation a bit challenging as it was quite difficult to meet up with my partner.

Another idea that emerged from the data was the fact that engaging in playful activities helped to lessen some of the initial apprehension or uncertainty experienced by students and children. For example, student S1'20 noted:

> Introducing a playful activity in the testing allowed the users to really let go and immerse themselves more openly and fearlessly. This, in turn, allowed us to gain feedback that was far richer and far more honest, as all pretences had been discarded. Similarly to how I had initially been uncomfortable with the syllable game[37], only to gradually loosen up and enjoy it, I observed how participants in our testing were gradually able to engage more genuinely with the app as they became more immersed in the game.

Likewise, student S6'20 reflected:

> As typical when stepping into unfamiliar situations, there was a period of awkwardness that preceded the activities. This moment of discomfort felt slightly different as interaction now occurred online instead of in-person. However, this quickly dissipated as the activities continued. With each piece of newfound knowledge I became more confident in my thinking.

The idea that play allowed students to loosen up came through strongly in the written reflections, and this is illustrated in more detail in the following section.

- *Relieving stress*

At the onset of the project, many students reported feeling stressed, overwhelmed and burnt out. This was attributed to a combination of the stressful and unpredictable COVID-19 context in which they had been working for some months, as well as the pressure of

[37] The syllable game referred to here was a game introduced as an ice-breaker during the virtual play workshop. *Poetry for Neanderthals* is a game where players need to explain concepts to each other using only one-syllable words. One player is assigned a "no-stick", which is used to whack another player if they get it wrong (using more than one syllable). This game was adapted for a virtual space and students played in virtual breakout rooms.

deadlines and studies in general. In their reflections on the play workshop, many students noted that the workshop served as an outlet for stress, and that it was a welcome break from serious academic work. For example, student S1'20 wrote:

> Going in tired and stressed, it was amazing to see just how everyone loosened up with the handful of games Karen and Megan made us play. This observation made me appreciate even more how powerful play is and how useful it can be. Even I felt comparatively more energised and open after being immersed in play.

Similarly, student S2'20 reflected about their experience of the workshop:

> I was calm and very relaxed. Due to the hectic schedule and stress that I constantly endure, it was refreshing to be having fun and not worrying about the next due date. It reminded me of my childhood and of some of the games I used to play when I was young.

Student S19'20 noted that, despite not feeling energised to start a new project, the play workshop was refreshing:

> Honestly, at first, I was tired and not really "in the mood". But my tune changed quite quickly as we started the Play Workshop. I was excited to learn, to play and to engage with the information and activities. I felt happy and uplifted from the positive environment and the heavy emotional effects from the previous project soon faded away. I felt refreshed.

Likewise, student S3'20 wrote that the workshop was a helpful transition to ease the stress from the previous project they had just completed:

> The workshop was a welcome experience following the previous project, as I found that I was left with a tenseness and a numbing of my creative abilities without realising it at the time. Through the interactive activities and general creativity that was encouraged, it not only felt like a calming experience, but it woke the kid inside of me up again. All in all, it was a good reminder that in the midst of stress, its beneficial to include aspects of play somewhere in your life to keep yourself going.

For many students, being given permission to play during the workshop evoked a sense of nostalgia; they also commented that they began to remember how to play again. Student S19'20 reflected:

> The Play Workshop was very engaging and interesting. I wanted to listen and to play (partake in the activities). I felt comfortable to relax and have fun, to play like a child again. Perhaps being in my own space with no-one able to see me gave me the "okay" to have some fun and play around. I didn't feel like I was being judged, everyone was laughing and just having a great time. Adults also play in some form or another, it is nothing to be ashamed about. Playing is fun and such a great stress-reliever (despite fearing judgement). When I view play now, I can only think about positive thoughts and which game I want to download next. No more worries about

> judgement or being viewed as childish. Play isn't intimidating, it is quite the opposite!

Many students commented that they enjoyed interacting with their classmates during the play workshop, especially since they had been isolated for some time. For instance, student S21'20 reflected on their experience of the play workshop:

> I felt light and more alert. I noticed that my posture became more relaxed and I moved freer. I also felt happy connecting with my friends and colleagues in a fun activity. It broke down some barriers and I noticed some people opened up.

Student S23'20 commented that, despite initially not been keen to participate in the workshop, the experience was enjoyable and enabled connection:

> I also thought that I would dislike the workshop since it seemed like a waste of time because it meant we had to play games that were meant for 'children' but in the end I enjoyed myself completely, I got to know a different side to my classmates and I felt very relaxed and stress free after the workshop. It definitely surprised me in a good way. Right after the workshop I talked to one of my good friends who studies Occupational Therapy and she also told me a lot about the big role 'playing' has in our lives.

Student S20'20 remarked that they were inspired to play after the workshop:

> Learning what play can do for children is extraordinary. It surpassed my assumptions. The play workshop helped challenge my mindset of play so much that I have gone out to download new games as well as playing games with friends to help with anxiety of lockdown.

Lastly, although most students reported that play helped to ease their anxiety, the pressures felt during the pandemic remained strong for some students. Student S7'20 commented that:

> It was nice to be given the permission to play again but it felt as if the monster that is 2020 was too big to be vanquished by the workshop and I was unable to fully let go and enjoy the experience.

Owing to technical difficulties, some students also reported that they struggled to relax and connect as they would have like to during the play workshop. For example, student S15'20 reflected:

> I felt quite anxious while being immersed in play, because it was hard for me to stay on track with what everyone said, due to my failing Wi-Fi (I was really sad that my wifi was bad on that day). Once I got the group to send some things in the chat section to help me play along, it went much better and I could interact more. But still I felt disappointed to not be able to fully participate like I would have if it were face to face.

- *Longing for face-to-face connection*

A theme heavily influenced by the context of the COVID-19 pandemic, is that many students reported a longing for face-to-face connection with peers and facilitators. In addition to this, some students reported that they felt challenged by virtual collaboration, both with their team members as well as with children and parents. Students also expressed a longing to have had an in-person play workshop, instead of one adapted for a virtual environment. Student S10'20 commented:

> I didn't completely enjoy that the play workshop had to be virtual. I would've much preferred a face-to-face workshop. It felt a bit hard to connect over a screen.

Similarly, student S14'20 wrote:

> Play definitely works better in a face-to-face setting. It was somewhat harder to communicate and 'connect' with fellow classmates when doing activities during the workshop. Some classmates didn't turn on their webcams at all, leaving one to talk to a faceless entity. It was uncomfortable, you couldn't really 'read' the room. I would firmly suggest that in order for play to be successful, it should be done in close proximity in order to build genuine connections.

The digital platform also proved challenging for some students, like student S11'20:

> My Zoom threshold is very short and the session was incredibly long. I grew tired very quickly. Not because the content was disengaging, but because looking at the screen and having to take in so much information in that format was tiring.

Regarding connection difficulties, student S21'20 commented:

> Playing on Zoom was challenging due to connectivity issues from some players. I found it easier to be silly and communicate more openly because we weren't face-to-face, however, I did feel awkward during one game where I had to bark like a dog if someone got an answer wrong.

On the topic of working with a teammate, students reflected that they enjoyed the opportunity to interact and collaborate with another person. Student S23'20 reflected:

> I found that spending time with somebody, especially since we haven't worked together in a long time because of Covid-19, was very valuable. It was also very refreshing to work with somebody who things differently and has other ideas.

Similarly, student S7'20 wrote:

> It was very rewarding being able to build on each other's ideas and collaborate in our creation of something wonderful. It was also great having someone else you could rely on for support and help when needed. The social interaction with a class member was really nice to experience again.

Despite enjoying the opportunity to collaborate, not being able to work side-by-side so easily proved challenging for some students. For instance, student S16'20 said:

> I found it challenging not being able to sit together and work in person as much. The little chance we got to work together we made our most progress.

While student S23'20 remarked:

> I found the fact that we couldn't physically sit next to each other very challenging. There were times where screenshots and screen sharing just didn't help me explain some things.

A similar challenge arose for some students when collaborating with research participants. Student S19'20 noted:

> Getting user feedback was quite challenging, especially regarding the circumstances around Covid and having to fully rely on virtual communication.

- *Rethinking own design process*

As mentioned previously, strong emphasis was placed on the research component of the project, but particularly with regard to conducting primary research and play testing. Although some students reported not being excited initially by the prospect of conducting rigorous research, many reflected that they found the research process valuable. This value is attributed to insights gained about their target audience, as well as the reward of designing something tailored to a specific user. The research phase also challenged assumptions with regard to what students understood as "best practice" designing, as well as challenging their personal biases. For example, student S1'20 wrote:

> As we jumped into our primary research, with interviews and initial play testing, I quickly realised that I had to adopt a more human-centred approach to the research and design process. I could not rely on best practices or be autocratic about what I assumed would be best. Surveys and interviews consistently surprised me with the insights they brought. Insights I would've missed had I not surrendered my "autocratic" stance.
>
> Even though I had come to relinquish control in the research phase, I found myself reverting to best practices when designing the app interface. As we rolled out the prototypes, it became clear that kids could not intuitively navigate a UI/UX that, retrospectively, was designed for adult users. We had to step back observe what formats kids' games and platforms used, noting what worked and what didn't, and reworking our own format to be more kid-friendly.

Based on their experience of the research process, many students reflected that they would like to adopt a more human-centred approach in their own design process going forward. Student S1'20 continued:

> For future projects, I plan to adopt a human-centred approach as much as possible, as the quality of feedback we have received has undeniably given us valuable insights that could not have been garnered otherwise. No one is a better judge of a product than the person it is intended for.

Similarly, student S7'20 wrote:

> It has taught me that just doing secondary research about a target demographic is not enough and that actually interacting and talking with them is the key to getting a better idea of how their minds work and the challenges they might face.

The research process proved more enjoyable for some students than they anticipated, like for student S10'20, who reflected:

> I didn't expect to enjoy the research process so much. I see myself as an impatient person and often want the first solution to be the best one. Working so closely with children and gaining their perspective on things really inspired me to enjoy the process more. To not rush to the finish line, but to take time to truly gain a broad understating of the problem in order to find the most appropriate and sustainable solution.

Another way in which students expressed a change, or desire to adapt, their own design processes, was to be more playful in their design approach going forward. For instance, student S8'20 noted:

> The initial aspect of 'play' in the play workshop made it a fun and memorable experience for me. Furthermore, I remembered to incorporate my own play into the design process. Playing games from my childhood helped me to remember what my mindset was like during my childhood. I was able to think in terms of the target audience. It also helped me look at the project from a different perspective; instead of thinking like a designer, I was thinking about what I would've enjoyed as a child. It made the entire process much more fun as well, as I had not played games in quite a long time.

Likewise, with regard to including play in the design process, student S7'20 reflected:

> [The project process] also encourages you to find play at every stage of designing, making the process feel less like work, and more like fun. This leads to outcomes that are more successful and enjoyable for both the designer and user. Keeping play in mind also keeps the mind engaged allowing you to identify opportunities and connections you might have missed otherwise. Play is also super useful in breaking down the perceived walls between you and the user because it levels the playing-field and acts almost like a universal language. This allows us to look past that which makes us different and helps greatly to empathise with one another.

As the students had completed UX/UI or projects previously, many were familiar with the practice-based approach to designing something for a particular user, and to prototype the app to ensure its usability. However, some students reported that the addition of play to the project process refreshed their thinking. The following sentiment by student S9'20 speaks to this point:

> This aspect changed the development of the final product greatly, compared to other similar projects we have done before. This gave us a great opportunity to bring our own love of play into the project and this made it more enjoyable for us. Thinking back to my own childhood memories, going through old books and pictures, I placed myself into the shoes of our target audience and then incorporating the aspect of digital technology into it, it was like transforming the old into something entirely new.

Lastly, many students noted that the process of play testing and engaging in primary research proved highly rewarding. Students enjoyed seeing children interact with their designs, and they felt good about producing something that could be used and valued in real life. Student S17'20 reflected:

> Testing and questioning people was also challenging as we were sadly not able to see them in person, but getting their feedback and actually seeing the animals the kids built was so exciting. I received a video of [the kids] laughing and playing while building the leopard that brightened up my day. Seeing that we were making kids and guardians connect and laugh by creating something together was the highlight of the project to me. I would implement this type of problem solving again, because I feel like our app has the potential to really spread positivity and help people connect.

The last four reflections, aside from indicating a shift in the students' approach to their own design process, also indicate the potential of play to enable empathy when included in the design process. As this is a theme that emerged strongly from the student reflections, it is discussed in more detail under the heading below.

- *Enabling empathy*

As mentioned previously, some students reported feeling unsure or apprehensive about the prospect of interacting with children. However, a theme that emerged from the data was that students enjoyed their interactions with children, and that these interactions challenged their assumptions about children. For example, student S14'20 wrote:

> Before the workshop I had the idea that we would struggle to work with such a young target audience. But was surprised to find that 6–8-year-olds are a lot better versed and mature than I anticipated. Especially tech savvy children seemed to be more emotionally developed. A lot of my anxieties were alleviated, and some of my

> fears resolved. I now had a better understanding about how to interact with a group of people I wouldn't converse with in normal situations, in order to gain meaningful feedback and insights.

Likewise, student S19'20 reflected that the differences between them and their target audience became less as a result of playing with them. Through play, connection and communication became easier and students could learn about the world of children:

> Since we aren't children, don't have children or perhaps don't interact with children, it can be easy to make assumptions about how children play/what they like or dislike/how they communicate/how they understand things etc. Play is such a wonderful tool to grasp a better/more informed understanding of the target audience and how to design for them and not for yourself and your assumptions. It resulted in the project being well considered and well received by our testers as the design included them. Not only did it inform our decisions, it also made our design process fun and enjoyable. Adulting can easily become threadbare and boring. We were kids once too who also played. We still play in some form or another till this day and it was a great opportunity to reconnect with our fun and playful side. We could have fun while creating something fun for someone else to have fun.

The comment by student S19'20 above touches on the idea that students enjoyed the opportunity to be less 'serious' in their approach and to be more like children again. Similarly, student S18'20 reflected:

> We got to be children again. We were allowed to let go and be silly. It was fantastic for empathy-building because I could see why kids found adults so boring. To be honest, I was fearful of kids before we did this project. I never knew how much they could understand of what I said and I didn't know how to relate to them. So, to learn about the different stages of child development and to learn about how trauma affects a child, injected knowledge into a fearful place and made me feel powerful. I flippen LOVE playing with kids now. As the play testing sessions progressed, I loosened up more and more until I was a fully grown adult, blindfolded and giggling as she tries to throw a roll of toilet paper at a kid while she is hula-hooping… How is this an honours /final-year degree?? I had so much fun.

Aside from the enjoyable aspect of play, some students noted that playing with children allowed them to be more curious and perceptive. This comes through in student S25'20's reflection after the play workshop:

> After the workshop I didn't see our target audience as merely a 'kid' anymore, but very interesting perceptive little human beings that I felt I understood better now.

Where the play workshop may have acted as a springboard, the play testing sessions with children enabled experiential learning for students. During these sessions, they could learn and connect with children through play, while gaining insights about their designs. For instance, student S14'20 explained:

> There is a more relaxed vibe while gathering insights through play. With an air of silliness and no judgement, it offered us an opportunity to be more inquisitive and observing without play testers or users feeling uncomfortable or interrogated. We were able to glean more useful information in a shorter timespan out of our tests than we likely would have in a traditional, straight forward and 'impersonal' interview.

- *Remembering to play*

Playing during the play workshop, as well as during the project amongst themselves or with children, allowed some students to realise the value of play in their own lives. Moreover, students reflected on particular types of play that they enjoyed, and on what spurred on their creative process. For instance, student S10'20 wrote:

> I definitely try to incorporate play – guilt-free play! – into my weekly routine. I have found that it's important for me to nurture my creativity as a tool.

Likewise, student S16'20 reflected:

> The different types of play really helped you to find what is fun for you. The workshop helped me to find the one I enjoy most and I have actually included it in my life.

Student S25'20 touched on feeling nostalgic during the play workshop, and noted that playing during the project improved creativity:

> It helped me get into a positive energised mood for the project. I went down a trip in memory lane when the play therapists asked us to name games that we played as a child. It helped me remember what it was like as a child to play, and this helped me understand my user audience better. The play also helped with creativity in this project.

Learning about the benefits of play during the play workshop, as well experiencing play at different points during the project, also proved motivating for many students. For instance, student S5'20 wrote:

> At first, I was a bit sceptical, being an introvert in lockdown with not much physical interaction did not help much but the worship helped move out that ''self-zone''. Soon participation was no longer a question of ''do I really have to '' but ''what can I take part in next''. You realise the effects of play afterwards as you compare your time spent without play to the time you just spent and the effect was highly beneficial, especially in developing motivation to start of a new project.

5.2.6 Summary of empirical findings from the case of 2020

This section presents the research findings from the QCA, conducted of the student process documentations and written student reflection questionnaires, for the cohort of 2020. The recordings of student consultations were also consulted in order to corroborate the findings from the process documentations and the reflections. The recordings of the Zoom consultations with students comprised roughly 46 hours of audio, which were transcribed using Otter.ai and checked carefully for quality and accuracy. The reason for opting not to conduct an in-depth QCA of the transcriptions was in part owing to time constraints, but chiefly because the student documentations and reflections presented a clearer representation of the process followed by students, as well as their experience of the process. In addition to this, no recordings exist for the cohort of 2019, which means that it is not essential to analyse this data to complete the cross-case synthesis, in keeping with the aims of this study. An analysis of the student process documentations revealed insights regarding the influence of the COVID-19 pandemic on the format of teaching and ways of working together in groups; how a research-led approach encouraged students to play throughout the project process; as well as how the format of digital prototypes enabled rapid and repeated play testing. In addition to this, the analysis of the student process documentations helped to plot the trajectory of the general process followed during the project, as illustrated in Figure 26.

The QCA of the student reflection documents resulted in a coding frame presenting six themes that emerged from the data. These themes are summarised in Table 9, with sub-themes included under each heading. To recap, the themes included:

- Feeling apprehensive;
- Relieving stress;
- Longing for face-to-face connection;
- Rethinking own design process;
- Enabling empathy; and
- Remembering to play.

Feeling apprehensive	Relieving stress	Longing for face-to-face connection
Nervous to work with children Uncertain about collaboration during pandemic Daunted by virtual project format	Came into project overwhelmed Stressful pandemic context combined with academic pressures Play workshop refreshing and motivating Play evoking nostalgia Judgement-free space Enjoyed connecting with classmates through play Technical difficulties limited play experience	Desire for in-person play workshop Virtual connection difficult Virtual platform frustrating Connectivity issues frustrating Enjoyed collaboration through group work Sharing ideas virtually is challenging
Rethinking own design process	**Enabling empathy**	**Remembering to play**
Experiencing the value of a human-centered approach Learning through interaction Valuing research process Playful approach refreshing Rewarding process Real-world applications	Enjoying interactions with children Challenging assumptions Bridging differences Improving communication Igniting curiosity Experiential learning	Valuing play in own lives Fuelling creativity Realising play preferences Motivating

Table 9: Summary of coding themes from 2020.

Chapter Five of this study presents the empirical findings from both cases included in this collective case study research. A QCA was conducted of each case, comprising the student process documentations and written reflection documentations, for the cohorts of 2019 and 2020 respectively. In this presentation of the research findings, the intention was to present each case as a holistic entity, and to not draw cross-case conclusions, but to simply to group and present insights as they emerged from the data. Following this, Chapter Six considers the cases side-by-side and arrives at a synthesis of the data, which also includes insights drawn from the conceptual framework, which was outlined in Chapter Two.

CHAPTER SIX:
CROSS-CASE SYNTHESIS

Chapter Five of this study presented empirical results from the two case studies in this collective case study. As suggested by Yin (2018:196), this case-based approach to conducting a cross-case synthesis allows the researcher to "retain the integrity" of the individual cases, before comparing or synthesising "any within-case patterns across the cases" (Yin 2018:196). Thus, the presentation of themes emerging from the empirical data, as outlined in Chapter Five, constitute "tentative conclusions about within-case patterns" (Yin 2018:196). Working with initial themes from the two individual cases makes it possible to have a richer and more nuanced discussion regarding any relationships that may have emerged across the cases. Thus, the purpose of Chapter Six is to present a synthesis and critical discussion of the themes arrived at for each individual case in Chapter Five.

Between the cases of the Design for Development projects of 2019 and 2020, many of the themes that emerged were related, or overlapped to some extent. As the cases were approached individually, the themes were named and organised by identifying experiences or ideas that continually emerged from the data. To recap, the themes identified from the case study of 2019 were: feeling out of their comfort zone; alleviating stress; being immersed in play; building momentum; learning about themselves; challenging assumptions; and adapting their own design process. From the case study of 2020, the themes identified included: feeling apprehensive; relieving stress; longing for face-to-face connection; rethinking own design process; enabling empathy; and remembering to play. The themes from both cases are indicated in the first two columns in Table 10 below. To enable a thorough discussion of the most prevalent themes from each case study, as well as to illustrate how these themes showed up in the context of the design process, I have elected to regroup and consolidate these themes as a part of the cross-case synthesis in this chapter[38]. Accordingly, these themes are discussed individually in the following sections. As an overview, the themes have been consolidated as follows: adopting a playful mindset / being immersed in play; stepping out of one's comfort zone; relieving stress; building momentum; learning about oneself; challenging assumptions; enabling empathy; and remembering to play (as shown in the column on the right in Table 10).

[38] The synthesised themes have been articulated using gerunds, denoting concrete actions taken by students owing to the introduction of play in the student design process.

Themes from the case: 2019	Themes from the case: 2020	Synthesis from cases: 2019 & 2020
Feeling out of their comfort zone	Feeling apprehensive	Adopting a playful mindset / being immersed in play
Alleviating stress	Relieving stress	Stepping out of one's comfort zone
Being immersed in play	Longing for face-to-face connection	Relieving stress
Building momentum	Rethinking own design process	Building momentum
Learning about themselves	Enabling empathy	Learning about oneself
Challenging assumptions	Remembering to play	Challenging assumptions
Adapting their own design process		Enabling empathy
		Remembering to play

Table 10: Summary of themes emerging from the cases if 2019 and 2020, and synthesis

6.1 Adopting a playful mindset and being immersed in play

In the introduction of this study, I refer to Paul Rand's (1965:155) idea that design is an intrinsically playful discipline. Moreover, Rand (1965:155), argues that this intrinsically playful quality could be harnessed to arouse students' curiosity, hold their attention and engage their creativity. The data from both case studies indicated that adopting a playful approach throughout their design process did in fact ignite students' curiosity, hold their attention and engage their creativity. However, it is important to unpack the notion that play can function on a continuum. As explained by Gray (2013:139), referring to play as an adjective, for example, being *playful*, denotes a more flexible approach to understand the act of playing, as opposed to the noun, *play,* which suggests that something wholly is, or isn't play. Considering both the case studies of 2019 and 2020, it becomes clear that students were immersed in play during some instances of the project; for example, when engaged in play testing or prototyping with peers, children or parents. Another instance where students reported being immersed in play was during the play workshop, more particularly during the in-person play workshop held in 2019. However, an introduction to play, both during the play workshop and as a result of the project requirements, which asked students to play with, and design for children, helped to cultivate a playful mindset in

students. This playful mindset served as an underpinning attitude, which remained present throughout the project process. Thus, even when students were not overtly playing or immersed in a specific play activity, they could retain a playful mindset or playful lens through which they viewed their process. As such, the first theme for the cross-case synthesis consists of two states on a continuum: adopting a playful mindset and being immersed in play. Both concepts formed an integral part of the student design process, and each served a particular purpose at different points during the process. For example, a playful mindset helped students to feel less academic pressure, to be less fearful of making mistakes, and to engage in creative exploration. In addition, a playful mindset enabled students to engage playfully with their group members and their collaborators during the project. In the instances where students were immersed in play, they reported increased focus, as well a sense that they were entering a reality removed from everyday stressors. In addition, after being immersed in play, students reported increased motivation, as well as inspiration, which served as a catalyst to drive their project process forward. This sense of motivation, which resulted from being immersed in play, is discussed in more detail in the section on building momentum later in this chapter.

6.2 Stepping out of one's comfort zone

During both the Design for Development projects of 2019 and 2020, students reported an initial feeling of uncertainty at the onset of the projects. In 2019, this uncertainty was more often described as a sense of uncertainty related to collaborating with children, working with new team members, as well as uncertainty about the idea of having to play during the project. The context of the COVID-19 pandemic contributed an additional layer of uncertainty for students in 2020. Students felt unsure about how they could play and collaborate, both with children and families, as well as their teammates, while having to navigate restrictions during the pandemic. In addition, students reported feeling initially apprehensive about the idea of a virtual play workshop, as they had looked forward to one presented in-person, and experienced a longing for face-to-face connection with lecturers and peers. Like sentiments shared from 2019, many students of 2020 reported feeling unsure of how to play, and moreover how to play with children. Also, as a result of increased stressors during the COVID-19 pandemic, as well as the necessity of online teaching, students reported feeling under immense academic pressure. Some students reported to feeling burnt-out, drained and as if they lacked creative energy and motivation. Thus, there was a sense of apprehension at starting a new project.

The context provided by the project brief during both 2019 and 2020, as well as the subsequent play workshop, invited students to move out of their comfort zone. In a sense, the project brief served to provide “rules of play” as outlined by Rand (1965:155). These rules stipulated the target audience for which students were designing, the duration within which they needed to finish the project, the human-centred lens through which their solution should be approached, as well the issues that their solution needed to address. In the instance of 2019, a theme selected by students had to be married with a design principle and address a social issue faced by children or parents, whereas in the instance of 2020, the design solution had to encourage connection through play. Rand (1965:155) also mentions that “rules of play” are influenced by explicit or implicit structures within which design problems are framed. From a pedagogic point of view, the way in which the project briefs were structured align with Davis’ (2017:82) explanation of a “deep structure of design pedagogy”. This means that students are given the opportunity to learn through the process of designing and are requested to champion process by making use of tools such as diagramming, observation and prototyping. It is also worth mentioning the “implicit structure” of the project brief (Davis 2017:83). Since the way a brief is framed influences students’ approach to the project from the onset, it is important to remember, as Davis (2017:83) argues, that design is never free of bias. In the same way, design pedagogy can never be free of bias, and students are inevitably influenced by the approach of their facilitators, as well as the themes set out in the brief and how they are carried through during the project.

While the project briefs provided context and “rules of play” to invite students to begin their design process, the play workshops were the first invitation for students to step out of their comfort zones and engage in play. The play workshops, for both 2019 and 2020, served as “playful triggers” (Loi 2007:237) and kickstarted the students’ design processes. Student reflections on their experiences of the play workshops from both 2019 and 2020 reflected Loi’s (2007:237) argument that playful triggers could encourage a rekindling of the joy of play, or of playful, active, and sensory experiences. Loi (2017:237) argues that playful triggers, by means of experiential learning, invite participants to challenge known ways of doing. By engaging playfully when immersed in these kinds of activities, an environment is created that is conducive to collaboration, and shared learning opportunities and practices (Loi 2017:237). Although playful triggers were evident during various parts of the project process, the workshops served as an initial catalyst to cultivate a playful mindset, as

discussed in the previous section. In addition, the play sessions during the workshop provided an opportunity for active, experiential learning.

During the in-person play workshop in 2019, students played with each other in their groups[39], and engaged with different types of play set out by the facilitators. Photographs from the play workshop of 2019 are shown in Figure 27. Students who participated in the workshop of 2019 reported that the session helped to create a sense of camaraderie within their groups, provided valuable information regarding developmentally appropriate play for their target audience, and helped them to learn about the kinds of play they enjoyed themselves. Moreover, the workshop helped to get students excited about the project, inspired them to create high-quality design artifacts, and encouraged them to continue playing throughout the project process.

Figure 27: Play workshop, 2019

[39] For both the design for development projects of 2019 and 2020, students were allowed to choose their own group members.

Moving the Design for Development project fully online, as a result of nationwide restrictions during the COVID-19 pandemic, was a daunting task for us as facilitators. In particular, we were unsure how the concept of experiential play would translate on a digital platform. Insights gained from the students' reflections, however, revealed that students benefited from the play workshop despite the platform. Figure 28 shows a screen shot shared during the play workshop, featuring different biblioplay apps. An unexpected benefit of the virtual platform was that students were easily able to download these featured apps, could often access them for free or buy them if they chose to, and could play them in their own time. In this way, play, albeit in a digital form, became more accessible to students. Students subsequently reported that they continued to prioritise playing after the project, either by themselves or with their families and friends.

Figure 28: Screen shot, digital examples of biblioplay in the play workshop, 2020

Although students were not able to play together physically in a group setting during the play workshop of 2020, they were able to complete challenges individually to share with the group. Figure 29 below shows an example of a mastery play challenge. Students were asked to draw a character, following a set of instructions read by the facilitator. Although the instructions were the same for all students, each character looked different. Students enjoyed comparing the different outcomes and the activity provided an opportunity for reflection. Completing this activity during the workshop helped students to experience different perspectives and approaches to the same problem.

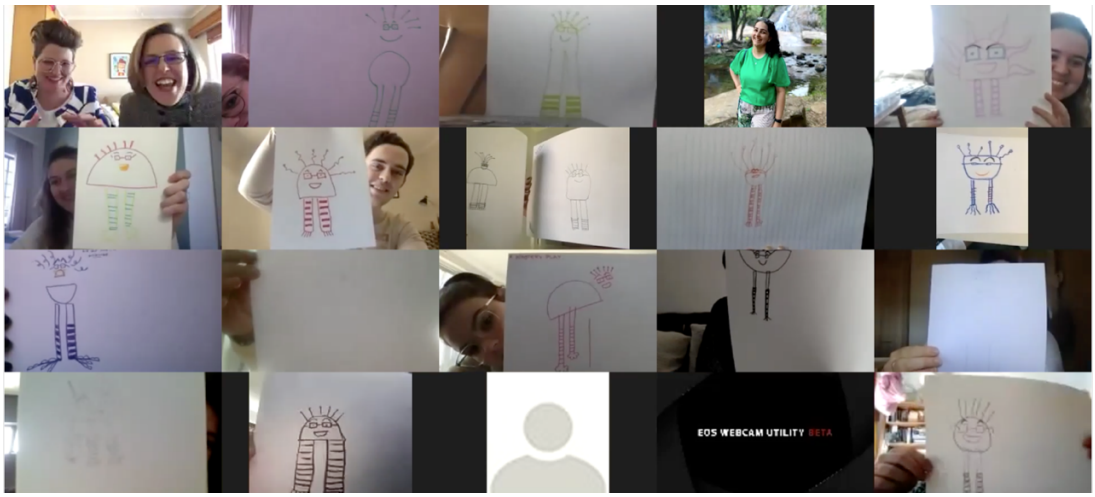

Figure 29: Students sharing examples of their mastery play challenge, 2020.

The socially interactive nature of play (Aistear 2009; Huizinga 1938; Lego Foundation 2019) becomes evident through the student reflections of both 2019 and 2020. As mentioned previously, the play workshop of 2019 helped students to build rapport within their groups. Although this looked different in 2020, students reported being grateful for an opportunity to play and interact with class mates, and also enjoyed reminiscing together about play as a group. After each kind of play was discussed during the workshop, students had to collaborate and jot down favourite play activity from each category on a white board in Zoom. Figure 30 shows a screen shot of what students shared for mastery play, and Figure 31 shows what was shared for sensory play. Sharing these play experiences provided an opportunity for students to learn from each other; in some instances, students had to explain the games to the class. These interactions also highlight the socially interactive nature of play. Leaning into the socially interactive nature of play during the workshops helped students to experience social benefits of play, as well as to cultivate a playful mindset that could be carried through as they began to work on their projects.

From both the student reflections of 2019 and 2020, three reasons for uncertainty or apprehension at the start of the project emerged, namely: uncertainty about working with children; apprehension regarding having to play; and uncertainty regarding group work and collaboration. Students were pushed out of their comfort zones and had to face these uncertainties at various instances during the projects. Firstly, the project brief and context provided “rules of play” that required certain actions to be taken to successfully complete the project. Secondly, the play workshop created an environment where students had to play and collaborate collectively. Thus, these two aspects served as a catalyst to move students out of their comfort zone. Thirdly, at later points throughout the projects, such as

when students were playing with children, or interacting with collaborators, they stepped outside of their comfort zones again.

Figure 30: Students sharing their favourite kinds of mastery play, screen shot via Zoom, 2020.

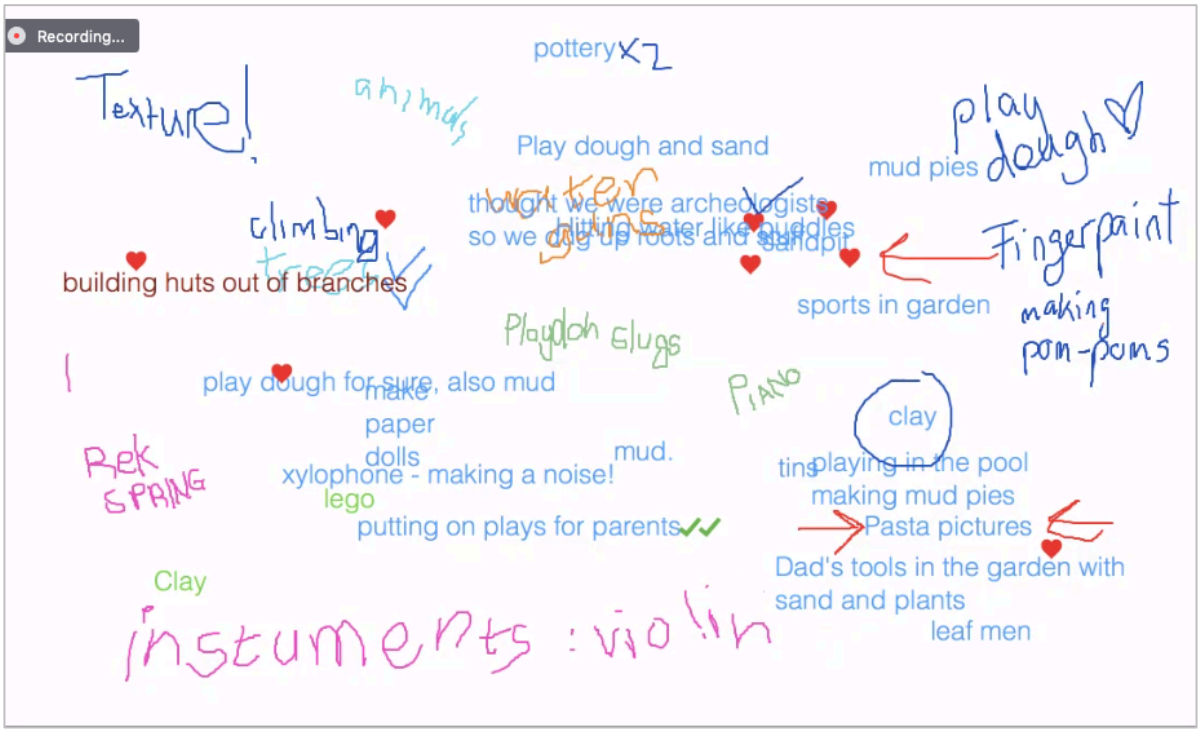

Figure 31: Students sharing their favourite kinds of sensory play. Screen shot via Zoom recording, 2020.

6.3 Relieving stress

Empirical data from both the case studies of 2019 and 2020 indicated that including play in the student design process helped to relieve stress for the students. Insights from the play workshop of 2019 reflected Rice's (2009:102) observation that play enabled heightened sensory awareness in students. This sensory awareness was brought about most particularly by engaging in sensory play activities, such as playing with play dough. However, students were also aware of the reactions of their group members and were invested in the process of play. Moreover, many students reported heightened focus and alertness, as well as a sense of being in another world while at play. This break from "reality" during play is in line with the Lego Foundation's (2019) argument that play should be "actively engaging". This means that, when engaged in play, players should experience mental immersion and should be resistant to distractions outside the world of play. From the student reflections on the play workshop of 2019, as well as my observations during the workshop, it came across clearly that students were indeed immersed during play, and that they focused intently on the task at hand.

Although students from 2020 reported that they felt less stressed after the virtual play workshop, observations regarding increased focus and complete immersion were not comparable to those of 2019's play workshop. Some students commented that they felt play was a difficult concept to translate virtually. In addition, some students felt that they could not fully immerse themselves in play owing to the limitations of the virtual platform. In the case of the play workshop of 2020, based on student reflections, the workshop could be described more as refreshing, and as a welcome break from academic pressures. Students also appreciated the nudge to play, which they did do subsequently in their own time. In the case of 2020, students reported that experiences of play during the project helped to relieve stress for them. These kinds of experiences include play sessions that some students hosted with children, play sessions amongst themselves or with their families, play sessions with their target audience, as well as leisure play that they were inspired to partake in after the play workshop. Therefore, although playful immersion was not as possible during the play workshop of 2020 as with that of 2019, students nonetheless incorporated play into their project process.

6.4 Building momentum

Including play in the student design process helped students, in both the class of 2019 and 2020, to build momentum while going through the project process. Initially, the play workshops served as a catalyst to cultivate a playful mindset amongst students. The workshops also inspired students to create high-quality design artifacts, and to engage with expertly designed material that already exists for children. In addition, the context of the project brief and workshop encouraged students to enjoy the project process, and to include play as much as possible during their own design process. As stated by Gray (2013:153), when engaged in play, students learn as a by-product of play, and play is engaged in primarily for the sake of enjoyment. From the student reflections of 2019 and 2020, it became evident that students chose to engage in play, throughout the project process. Although they were encouraged to include play in their process during the workshop, students that tackled this challenge with enthusiasm reported a great sense of satisfaction and enjoyment as a result of playing. During the project of 2020, the fact that we were unable to host an in-person play workshop hindered, to some extent, immersion in play by students. However, the digital nature of the design project opened up the opportunity for more iterative, and continuous, play testing. Students were able to produce working prototypes early on in their process in 2020; they did not have to wait to have physically designed material to test with kids as was the case in 2019. The virtual nature of working during the pandemic also meant that students could send their initial, clickable prototypes to families and play them amongst themselves. During a facilitator reflection session, the following comment was made by a co-facilitator (F1'20), comparing play testing during the projects of 2019 and 2020:

> I know some of the groups also highlighted how the prototyping helped them and [we] were just discussing yesterday that even though we couldn't unfortunately see [the students] in person… for the play workshop, and playing with them didn't happen. But the play still happened by prototyping. And what we found also that it felt more real and genuine and less reverse engineered, than with the physical toolkits, because then they wouldn't really have a concrete product to test. So, the prototyping in this instance, worked exceptionally well because it was digital.

Figure 32 and 33 shows a prototyping example from *Bugbox*[40] (2020), where paper prototypes were used in a physical play testing session with children. However, before the

[40] A summary of the *Bugbox* app is shown in Figure 34.

prototypes had reached this level of polish, the interface and game play could be testing by clicking through a working, wireframe version of the app. The frequency of the play testing sessions helped to spur students on, encouraged them to continually improve their projects, and got them excited. Students from both 2019 and 2020 reported that they enjoyed seeing their projects played by children in real life. During the project of 2020, however, this could happen more often because of the digital medium.

Figure 32: Example of paper prototypes by BugBox*, 2020.*

Figure 33: Bugbox *play testing session with children, 2020.*

Including play in the student design process helped to drive the student's iterative design process, which aligns with Gray's (2013:155) argument that challenges faced and overcome during play makes the experience more enjoyable and satisfying for players. Problem solving during play also requires creativity. During both the projects of 2019 and 2020, and in particular during 2020, students engaged in an iterative design process that meaningfully reflected the process of designing for and testing with an audience, completing multiple iterations and revisions.

PROJECT NAME	PROJECT THEME
BUGBOX	**ENCOURAGING OUTDOOR PLAY, EMPATHY FOR NATURE**
TYPES OF PLAY INCLUDED	**PHYSICAL PLAY, SENSORY PLAY, MASTERY PLAY**

SUMMARY

Bugbox is an app that encourages children and their families to spend time exploring together in nature. Themed around the idea of collecting treasures, players can challenge each other to collect creatures or natural objects by finding them in nature and photographing them, to store in their 'boxables' bug box. Players can also request swop-outs from their friends and do not have to be located in the same physical space in order to play together.

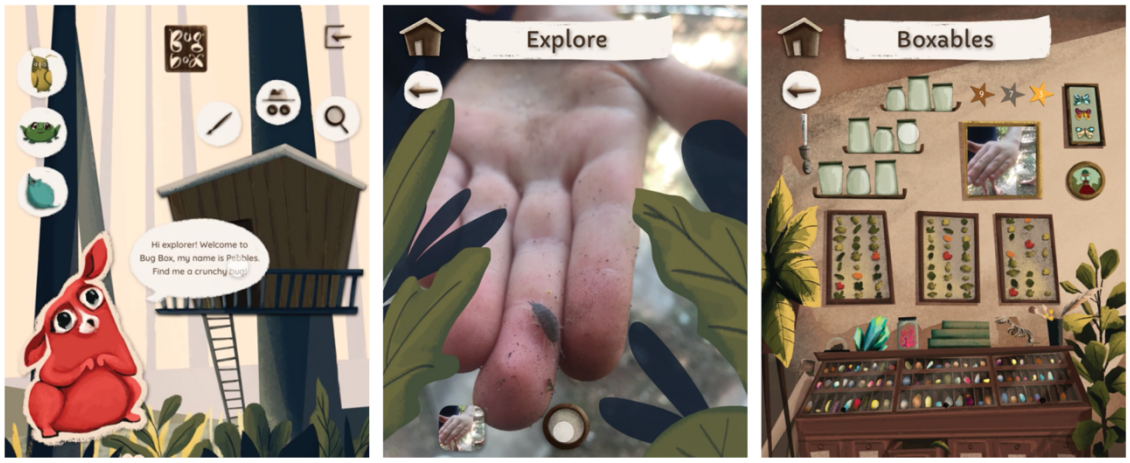

Figure 34: Bugbox *summary, 2020*

In addition, the feedback by the facilitators, in both 2019 and 2020, served to mimic feedback sessions in a professional design environment and could prepare students to handle constructive criticism and implement revisions. A comment by facilitator F4'20 during the final presentation in 2020 reflects this sentiment:

> I commend everybody. It is such an honour that we get to work with you in this way. We feel like it's such a valuable process for us. And it's so amazing to see what's produced… as I was thinking about this whole process, I really commend you for making this like structuring this in such a real-life way. It's not just assessing skills that that the students have learned over these last four years. But it's, it's taking them through a real process and, and we loved seeing how you how you students engage that from the research to the play testing; the consultations where you took feedback and had to then revise your projects. It's really mimicking what you'll be doing soon on your own. And I hope that you see that as a valuable process and to see what was difficult what you need to continue to hold on, whether it's the researching or playtesting, and how you can do that. So, you're ready for your real, real-world experience with design soon.

By replicating this kind of iterative design process, students were also able to build momentum in the sense that they became better equipped for their professional careers as designers after they graduate. This was made possible by employing a pedagogic strategy

of working with simulations and prototypes (Davis 2017:191). By working within a simulation that imitates “a real-world process or system behaviour over time” (Davis 2017:191), students could get a sense of how their products could be shaped in collaboration with their users, and get a sense of satisfaction by seeing how it would ultimately be received. The fact that both projects progressed over a certain timeframe, but needed to be completed within the deadline, allowed students to learn as time progressed, but kept them accountable to present polished designs by the end of the projects.

6.5 Learning about oneself

In an article discussing the role that reflection plays in shaping professional identity development for students in design education, Tracey and Hutchinson (2018:264) write that designers’ personal histories and identities play an important role in the design space. Moreover, Tracey and Hutchinson (2018:264) argue that professional identity development in the context of design education could be a way of integrating personal histories of students with “the responsibilities of design practice”. Tracey and Hutchinson (2018:265) posit reflection as a useful tool for identity development. Referring to Schön’s (1983) concepts of reflection in- and on-action, Tracey and Hutchinson (2018:265) argue that reflecting on-action is particularly useful when aiming to understand how reflection can aid identity development, as reflecting on-action enables “the dynamic narration and interpretation of past experiences rather than reflection that occurs in the immediate moment”. In the case of the Design for Development projects of 2019 and 2020, an analysis of the student reflections revealed evidence of professional identity development, as described by Tracey and Hutchinson (2018). One example from student S10’20’s reflection (included again for reference) illustrates how the student reflected on their own, perceived nature and how they subsequently reflected on how the project helped them to develop or see things from a different perspective:

> I didn't expect to enjoy the research process so much. I see myself as an impatient person and often want the first solution to be the best one. Working so closely with children and gaining their perspective on things really inspired me to enjoy the process more. To not rush to the finish line, but to take time to truly gain a broad understating of the problem in order to find the most appropriate and sustainable solution.

In addition to comments about shaping their views of themselves as designers, some students also expressed a desire to adapt their design process going forward, or to pursue

specific avenues of professional practice, such as designing for children, or human-centred design. Furthermore, the work produced by students showed evidence of their personal histories. A comment made by facilitator F4'20 during the feedback session in the final presentation in 2020 captures this idea:

> You could see through several of the toolkits and the ones coming up, that your personal story paved the way for you to access something, maybe you couldn't. And I think that's really important to think about to know your own story and to think what has formed you because those can sometimes give you clues as to what is important to you and what you're going to contribute because of the personal experience that you've had. And I appreciated that you guys, we could see you tapping into that. I just want to encourage you to pay attention to those clues because we can sometimes miss them but they're really important for us.

The immersive nature of play, as well as the fact that play is inherently meaningful and intuitive, as unpacked in Chapter Two of this study, makes it possible for playful experiences in an education setting to encourage experiential learning. This notion is reiterated by Rice (2009:96) when he argues that playful learning, in the context of higher education, can help students to become active participants in their learning process. The Lego Foundation (2019) also argues that playful learning makes it possible to relate new experiences to existing knowledge. In the context of the 2019 and 2020 Design for Development projects, students could experience play in different forms throughout their design process. In addition to this, the signature pedagogy of design (Davis 2017:93-99), where a studio project, which is situated in context, and aimed to address the needs of someone other than the students, also enables experiential learning[41].

David Kolb (2015:76) argues that the creation of knowledge relies on the process of first grasping, and then transforming, experiences. When "grasping" an experience, students take in information, and when "transforming" an experience, students interpret and act on that information (Kolb 2015:76). Kolb's (2015:77) experiential learning model, presented in Figure 35, shows how, when grasping experience, a student moves between two dialectic modes, from concrete experience to abstract conceptualisation. Next, when transforming experience, a student moves between two dialectic modes as well, from reflective

[41] Although a detailed synthesis on experiential learning theory cannot sufficiently be covered by the scope of this paper, a brief overview of Kolb's (2015) model for experiential learning is provided here. Kolb's book, *Experiencial learning: Experience as the source of learning and development* (2015) describes Kolb's process of experiential learning, and proposes a model for the undelying structures of the learning process. Kolb's applies his work on experiential learning in the context of higher education, as well as continuing education for adults.

observation to active experimentation. Kolb's (2015:77) experiential learning theory suggests that learning happens as a result of "the resolution of creative tension among these four learning modes". As a student moves through each touch point in the cyclical model, they engage with a concrete experience, observe and reflect on that experience, and derive abstract concepts based on their experience. Once these abstract concepts have been formed and distilled, new ideas for action and experimentation can emerge.

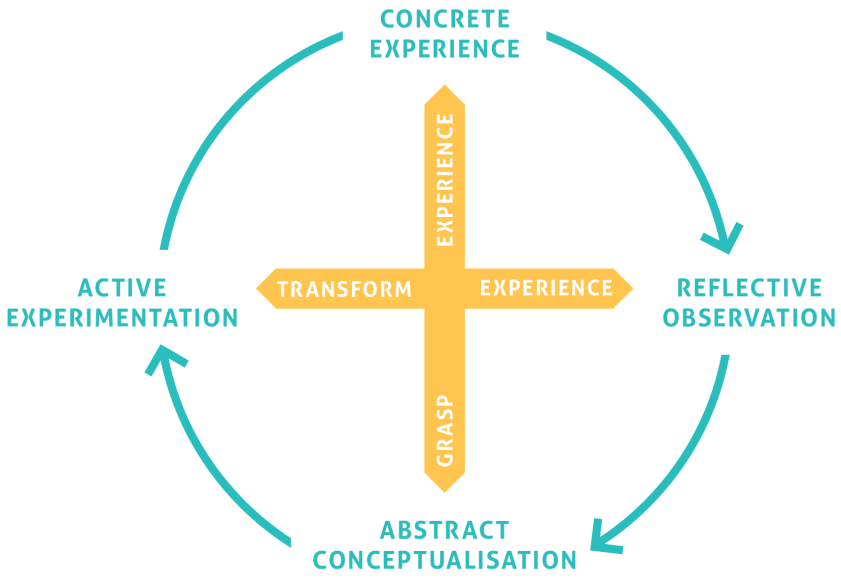

Figure 35: The experiential learning cycle (Kolb 2015:77)

By including play in the design process, students were able to engage in experiential learning, enabling them to engage better with the children they were designing for. Moreover, students could feel what it was like to play, reflect on past experiences of play from their childhood, and make decisions about their own play preferences. In addition, actively experimenting with play during the project helped students to design meaningful solutions and resulted in their enjoyment of the project process. Students also had the opportunity to reflect on their experiences of the project process, and of playing during the project. This reflection-on action enabled students to consider their professional identities as designers; students were able to consider their own design approach, and the kind of work they find meaningful.

6.6 Challenging assumptions

As discussed in Chapter Two of this study, both play and the design process are iterative. Moreover, play is socially interactive. During the project process of 2019 and 2020, students were required to engage with participants and move back and forth, in a process of iteration, to arrive at their final design outcomes. Play made this process more enjoyable and accessible for students in that it built a bridge for them to engage with their target audience. During the process of iteration, students had the opportunity to learn more about the audience they were designing for, and their assumptions were continually challenged. In particular, students from both the 2019 and 2020 cohorts noted that they underestimated children and their abilities to engage creatively in game play. Many students also noticed that they enjoyed the process of engaging with a completely new target audience much more than they expected to. Furthermore, students noted that their assumptions about designing for children were challenged. Initially, some students noted that they adopted too babyish an approach to their communication design; they were surprised by the visual sophistication of the children. Perhaps, as a result of the experiential learning embedded in the project process, coupled with playful iterations, students were able to translate abstract concepts into tangible, accessible products for children. Two project examples are included here, namely *Space Rush* (2020) in Figure 36 and *GrowIt* (2020) in Figure 37. Both these groups engaged in rigorous playtesting and cycled through many iterations to arrive at their design solutions. In *Space Rush* (2020), students translated the idea of time management into a space themed, mastery game. Players are required to complete a certain number of tasks simultaneously, some of which are time bound. To succeed in the game, it is necessary to consider the use of time and resources carefully. In addition to this, a battery pack forms a central component of the game play. The battery needs to be recharged intermittently for players to continue in the game; this becomes a metaphor for the importance of rest and balance.

PROJECT NAME	PROJECT THEME
SPACE RUSH	**TIME MANAGEMENT**
TYPES OF PLAY INCLUDED	**MASTERY PLAY**
SUMMARY	
Space Rush is a strategic mastery game that aims to teach to children about time management with the guidance of their co-players (parents or guardians). The intent of the game is to learn to juggle multiple tasks simultaneously and to prioritise rest as a means to refuel and recharge your batteries.	

Figure 36: Space Rush *project overview, 2020*

Comments from facilitators F3'20 and F4'20 on the students' approach in *Space Rush* (2020) illustrate the sentiment that the students were able to harness play and design to make an abstract concept more concrete and accessible for children. Facilitator F3'20 said:

> … because time management is such an abstract construct, and especially for this age group who battle with impulse control. So, it's not something that comes easy for them at all. And you make something that is so abstract, so concrete, and they can really get it, you engage them, you know, it's not up there. It's something that I can do and at the same time building their sense of self of this is within my ability to do this, and then that translates into the everyday life.

Similarly, in *Growit* (2020), students leverage the theme of nature as a metaphor in their app, that aims to instil a sense of mindfulness and gratitude in children and parents. In response to *Growit*'s (2020) final presentation, facilitator F3'20 commented:

> I absolutely agree…. about using the analogy of the garden, because it's an abstract construct that you make very concrete, and it's something that they know and that they can also notice in front of their eyes. So, there's a lot of implicit learning and you build that bridge very effectively. So that they get that construct… I love the scaffolding that you built in to make a very difficult and abstract construct very concrete.

PROJECT NAME	PROJECT THEME
GROWIT	**GRATITUDE AND MINDFULNESS**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, CREATIVE PLAY**

SUMMARY

Growit aims to instil a sense of mindfulness and gratitude in parents and children, by connecting them to nature and each other through a series of creative play activities. The app also includes prompts for reflection, which encourages discussions of thankfulness between parents and children.

Figure 37: Growit *project overview, 2020*

In both the examples of *Space Rush* (2020) (Figure 36) and *Growit* (2020) (Figure 37) students were able to translate abstract concepts into tangible and accessible games for children. Based on teaching observations from 2019 and 2020, it was evident that groups who really applied themselves to complete an iterative design process produced more meaningful design solutions. In addition, engaging with the target audience with an attitude of curiosity and an openness to learn, while tapping into the process-oriented nature of play, allowed students to have their assumptions challenged. Facilitator F2'20's comment after the final presentation in 2020 reflects the views of the facilitators post project completion:

> And also… what we mentioned yesterday is how proud we were of all of you for the themes that you selected, you grappled with themes that were often sensitive topics, or you grapple with themes that we could see that you were really passionate about, or that you had a personal interest in. So, it was wonderful to see how it most of you did really did a deep dive into your theme and the initial research. It was great to see how the primary research evolved for the most part from finding out more about your themes to the playtesting. And for those of you that did engage with the play testing thoroughly, we can really see the impact of that on your user experience overall and how that really informed a much smoother process, and it benefited your apps greatly.

From our teaching observations and reflections, the idea emerged that students managed to grapple with sensitive topics during their project process. They also approached these topics through play with children, helping to build a bridge and make the abstract topics more concrete. One aspect that is necessary for this kind of translation is empathy, which is discussed in the next section

6.7 Enabling empathy

In the field of human-centred design, empathy is often touted as the starting point of the process when approaching a design problem, such as in the case of the Standford d.school model (2021), discussed in Chapter Two of this study. In a paper presented at the *ServDesign* conference in Milan, Josina Vink and Anna-Sophie Oertzen (2018:471) comment on the "… growing acknowledgement of the over-reliance on empathy in design processes". Similarly, in an article in *Interactions* magazine, David Siegel and Susan Dray (2019) critique the oversimplification of certain tools used to empathise with the users in the domain of user experience (UX) design. These kinds of tools include empathy maps and personas, which are often created at the start of a user experience design project to better understand the end user of the product. Vink and Oertzen (2019:82) caution that, when placing too much emphasis on tools like empathy maps or personas, there is a risk "…that they create an illusion of understanding if too much credence is given to the tool and the mysterious process of inspiration". Furthermore, Vink and Oertzen (2019:83) posit that being empathetic means being able to "… put ourselves in each other's shoes despite our differences." A better way to search for empathy in UX design, according to Vink and Oertzen (2019:83) is to search for narratives, as opposed to "static descriptions".

Based om my teaching experience, and in particular while facilitating the Design for Development project since its beginning in 2015, I agree that it is tempting to present 'quick-fix' solutions as a rationale for design decisions in the domain of human-centred design. This is understandable to a large extent, as students work within tight deadlines, and are relatively new to the concept of human-centred design, especially the kind of design that requires participation from the end user, with multiple iterations in a real-world context. Although not all students engaged with the same level of depth and enthusiasm while engaged in primary research and play testing during the projects of 2019 and 2020, the groups who engaged with rigour found the experience rewarding and enriching. Aside from enriching the design process for students, engaging in play with children helped the

students to build shared experiences and to engage in perspective-taking. Although it falls outside of the scope of this study to delve in-depth into the concept of empathy from a psychological lens, I draw from Michele Borba's (2016) and Daniel Goleman's (2020) work on empathy to gain a more nuanced understanding of the concept. Borba's (2016) book *UnSelfie: Why empathetic kids succeed in an all-about-me world,* is pitched at parents and educators who wish to cultivate empathy in their homes and alongside their children. Borba (2016) explains four main tenets necessary for developing empathy, namely emotional literacy, moral identity, perspective taking and moral imagination These four tenets are visually depicted in Figure 38. Once empathy has been cultivated, Borba (2016) argues that it can be practiced, through self-regulation, exercising compassion and collaboration, and lived through promoting moral courage and growing altruistic leaders. Borba's (2016:49) explanation of perspective taking, as enabling us to "… step into another's shoes… and understand the world from his or her point of view" resonates with the experiences that students from both the cohorts of 2019 and 2020 reflected on after playing with children, or after playing during the play workshops.

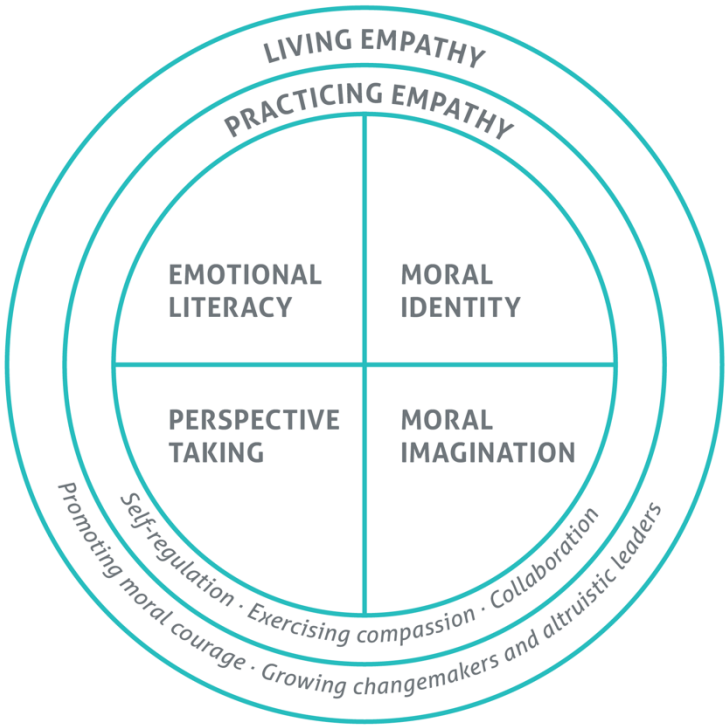

Figure 38: Four tenets of developing empathy, adapted from Borba (2016)

The work produced by many of the students shows great insight and attunement to the desires of the children that they were designing for. One example of this can be seen in the

Lapa (2020) project (summary shown in Figure 39), where students drew from their lived experience to design an app that leverages storytelling to encourage connection. During the design process, the *Lapa* (2020) students interviewed peers of their age and reflected on their experience of growing up in traditional, African families. From their own experiences, as well as insights gained from their primary research, students selected African folktales as the basis for their app. The idea is that parents and children would play together, while building a shared appreciation for traditional African folktales, rhymes, and songs. In response to *Lapa* (2020), facilitator F'3'20 commented:

> … I just want to commend you with the sensitivity and the passion that you did this with I can really see that and I think you managed to do really pack a punch because you were keeping cultures alive. You're facilitating emotional awareness and emotional literacy. You're also facilitating a deep appreciation and respect for all cultures that are different from yours. And also creating this deep appreciation for the art of storytelling and using stories.

PROJECT NAME	PROJECT THEME
LAPA	**ENCOURAGING CONNECTION THROUGH STORYTELLING**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, BIBLIOPLAY, DRAMATISED PLAY**
SUMMARY	
Lapa is an app that encourages connection between parents and children through sharing traditional African folk tales. The app includes traditional tales that celebrate heritage and culture; stories can be acted out, sung, or read aloud by children and adults. The app also builds reading skills and is tiered in difficulty for beginner to intermediate readers.	

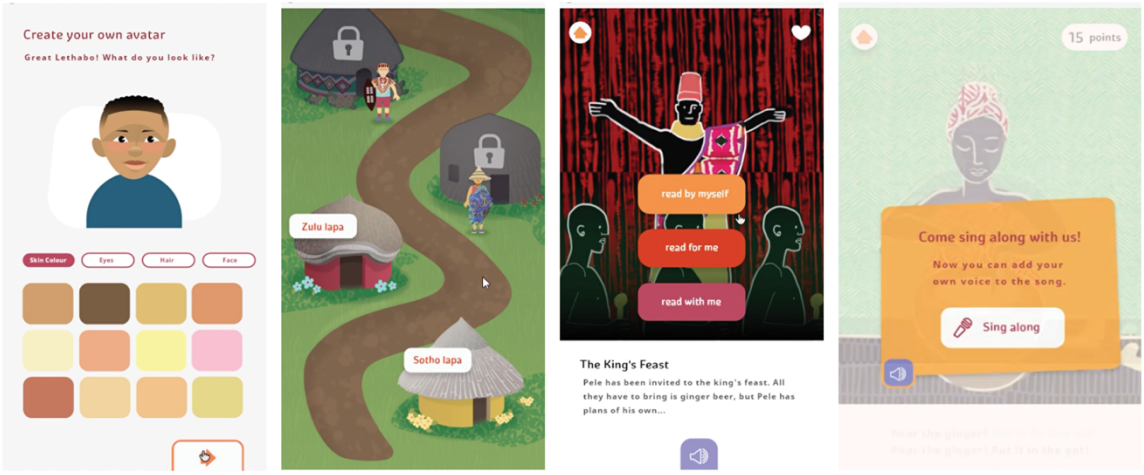

Figure 39: Lapa *project overview, 2020*

As general feedback on the projects from 2020, facilitator F3'20 commented on the students' ability to weave perspective taking and empathy into their project process:

> … some of you really chose difficult topics and they abstract and they difficult to engage with, especially for this age group. But in general, and you find such sensitive, well thought through solutions. And it is, as Megan says, because they inform from your lived experience. And I really encourage you to keep on doing that. Being designers out there in the world, let your own experiences, inform other decisions and create empathy and perspective taking within you. Because that's what you did. All of you, we can see the empathy, we can see the perspective taking…

Themes selected by many of the students also serve to build a sense of empathy amongst children, or players of the toolkits. For example, *Going Overboard* (2019) helps to build awareness of emotional regulation and equips children and parents with tools to practice those skills. *Foe Fiction* (2019) (Figure 40) aims to develop perspective taking skills, chiefly by means of bliblioplay. Borba (2016:79) comments on the way that reading, especially reading literary fiction, can help to cultivate empathy in children and build their moral imagination. Borba (2016:81) writes that "science theorizes that literary fiction focuses more on characters' lives and trials, while popular fiction is more concerned with the plot. The more effort we make trying to figure out a character's intentions, emotions, or thoughts, the greater the odds that our empathy muscles are stretched as well". For example, in *Foe Fiction* (2019), the narratives are structured to encourage perspective taking, by sketching nuanced characters and allowing children an opportunity to reflect on the motivations of each character through play. Although the toolkit serves to build empathy amongst children, the process of writing the story, designing the emotions of the characters, and playing through their own toolkit, served to cultivate empathy in the students as well.

Empowerpuff Girls (2019) (Figure 41) is a toolkit themed around gender equality, combining biblioplay, mastery play and dramatised play to raise awareness on the topic of gender inequality in a way that is accessible to children. The *Empowerpuff Girls* (2019) group consisted of one female and two male students; the two male students noted that they were happy to hand the leadership role to the female in the group. During their design process, it was interesting for us as facilitators to observe the dynamics within the group, and the way that the men advocated for gender equality by the end of the project. The male members of the group also reflected during their consultations that they were surprised by the research conducted for the project, and that their assumptions were challenged during the project process.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
FOE FICTION	**CONFLICT RESOLUTION**	**CONTRAST**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, DRAMATISED PLAY, MASTERY PLAY**	

SUMMARY

Foe Fiction is a toolkit that helps children to work through fictional problem scenarios to develop conflict resolution skills through play. A role-playing game teaches children how to identify emotions and express them in healthy ways - this activity includes a storybook, props, emotion cards and a facilitators guide. A biblioplay activity encourages children to build their own stories and see the consequences of their choices, while a board game encourages collaborative play.

Figure 40: Foe Fiction *project overview, 2019.*

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
THE EMPOWERPUFF GIRLS	**GENDER EQUALITY**	**BALANCE**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, DRAMATISED PLAY, BIBLIOPLAY**	

SUMMARY

The Empowerpuff Girls is a toolkit that aims to make young girls and boys aware that gender inequality exists, and to empower them to take action or change their thinking on the topic. Featuring female superhero mascots, the toolkit begins with a biblioplay activity and follows with a board game focused on character building and encouragement from peers. Lastly, children create their own cape and imagine a superpower during creative and dramatised play.

Figure 41: Empowerpuff Girls *overview, 2019*

The examples discussed in this section serve to demonstrate that, during the Design for Development projects of 2019 and 2020, the concept of empathy was not approached as merely a step to be completed in the iterative design process. Instead, through play, students were able to share some of the lived experience of children, while also reminiscing about their own experiences of play as children. Furthermore, the process of designing the toolkits, by means of crafting narratives, designing characters, and play testing their designs with children, enabled richer engagement and empathy amongst students.

6.8 Remembering to play

Huizinga's (1938:1) description of play as a "significant function", includes the argument that people do not need to be taught how to play, and that play is an intuitive function shared by all humans. Although play is not something that needs to be taught, it can be neglected through a lack of practice. A reflection by S8'20, included again as a reminder, speaks to the notion of forgetting to play, and being reminded of the value of play:

> The initial aspect of 'play' in the play workshop made it a fun and memorable experience for me. Furthermore, I remembered to incorporate my own play into the design process. Playing games from my childhood helped me to remember what my mindset was like during my childhood. I was able to think in terms of the target audience. It also helped me look at the project from a different perspective; instead of thinking like a designer, I was thinking about what I would've enjoyed as a child. It made the entire process much more fun as well, as I had not played games in quite a long time.

The value of remembering to play for students also extended to learning more about their own play preferences, fuelling their creativity, and motivating them throughout the project. Moreover, many students commented that they had made an attempt to be more playful in their own design approach going forward.

6.9 Introducing play in the student design process

To conclude this chapter, I bring together the themes synthesised from the empirical data in the case studies of 2019 and 2020 and illustrate their relationship to one another by means of a visualisation that presents a play-fuelled pedagogy of design. This synthesis diagram is also in aid of answering the research question: how does introducing play in design higher education influence students' design process?

From the literature review and theoretic framework in Chapter Two, it became clear that there are many links between play and design. Rémi Leclerc (2017:179) writes about his teaching experience at The Hong Kong Polytechnic University, where play was introduced in design higher education, with a view to "… leverage play's integrative cultural agency to facilitate students' acquisition of creative and instrumental thinking skills." In Leclerc's chapter *Play, Think, Design*, published in *Design Education for Fostering Creativity and Innovation in China* (Siu & Contreras 2017), he articulates correlations that inherently exist between play and design. Leclerc (2017:183) refers to these correlations as "conceptual bridges" that link play and design; and (2017:183) draws from play theorists Huizinga (1938), Callois (1961) and Sutton-Smith (1997) for this interpretation. First, Leclerc (2017:183) argues that while play is voluntary, and involves an arousal of body and senses, design is engaging as a practice, involving arousal and challenge. In both play and design, the activities are enjoyable and a sense of gratification is sought (Leclerc 2017:183). Furthermore, Leclerc (2017:183) asserts that play exists in its own realm, where the 'realm' in which design exists is determined by a project, or a problem space, on which "real life is reinterpreted". Huizinga's (1938) "magic circle" is referenced by Leclerc (2017:183) as existing in both play and design, where the "magic circle" constitutes a "temporary world within an ordinary world", where the player is focused and immersed during time spent in the circle. With regard to rules in play and rules in design, Leclerc (2017:183) argues that rules of play are set up specific to each game, and adhered to by players, where rules in design are determined by the brief, but the designer works in a self-disciplined fashion to work towards a solution. Leclerc (2017:183) also highlights the similarity between narrative play and imagining 'what if' scenarios in the context of design; moreover, he notes that play is ambiguous, with no pre-determined results, where design is ambiguous too in the uncertainty faced when attempting to tackle "wicked problems" (Buchanan 1992).

In both play and design, Leclerc (2017:183) argues that participants are motivated to discover and create. The experimental nature of design is aligned with the "unproductive" nature of play (Leclerc 2017:183). Finally, Leclerc (2017:183) concludes that "while design practice is still mostly focused and aimed at production, design schools are privileged environments…" in which experimentation is welcomed, and mistakes can happen if they are made "in earnest". This last statement, although true in an ideal design education scenario, is not always the case in the context of design higher education. From the empirical data for this study, it became clear that students experience high levels of academic pressure, as well as pressure to succeed and perform well in their design

projects. I argue that, despite the potential for design to include, as Leclerc (2017:183) phrases it, “experimentation, drifting, tinkering, error, rest, dream”, this is not always the reality in a design higher education context. The introduction of play, as Leclerc (2017:192) also argues, allows bridges to be built within cultures, in particular amongst students, and can serve to free students from a preoccupation with achievement, to encourage them to enjoy the design process.

A synthesis of the empirical data from the Design for Development case studies of 2019 and 2020, respectively, has resulted in a set of overarching themes, discussed earlier in this chapter. The themes, according to the visualisation of my findings in Figure 42 are further divided into states of interaction and consequences of interaction. For example, stepping out of their comfort zone, being immersed in play and adopting a playful mindset, are states of interaction. During these moments, students interacted with their environments in a particular way, and experiences from those interactions gave rise to certain consequences. These consequences of interaction include relieving stress, building momentum, learning about themselves, challenging assumptions, enabling empathy and remembering to play.

The first state of interaction, stepping out of their comfort zone, was a common theme for most students, according to their reflections and their project process documentation[42]. Often beginning with a sense of uncertainty or even apprehension, students were pushed to enter unknown territory by the context of the project and the requirements of the brief – in a sense, by the rules of play. The play workshops served as playful triggers (Lois 2007:237) and helped students to become immersed in play at the onset of the project. Subsequently, students fluctuated between the other two states of interaction for the duration of the project, that is, being immersed in play and adopting a playful mindset. When students were playing during the play workshops, conducting play research sessions with children, or play testing their designs, they were immersed in play. However, engagement in other parts of the design process, such as ideation, brainstorming or refining, was not necessarily coupled with immersion in play. Instead, students approached their work with a playful mindset. What I mean here by the term ‘playful mindset’ is that students reported to being less afraid to make mistakes, they were keen on experimentation, and felt free to explore new territories of design (that is, design for children). Students also reported being less

[42] For the class of 2020, insights from student reflections could also be corroborated by consulting the Zoom recordings from the class consultations.

afraid to collaborate with their end users, as play provided a safe space for them to engage with people in a non-threatening way.

The first consequence of interaction, relieving stress, builds on the previous comment that play helped to ease the students' stressors, including every day and academic stressors. Although some students did report feeling pressure to replicate examples of children's games shown in class, the overall impression from student reflections was that play brought a sense of relief from the deadline-driven approach of other design projects. A sense of ease with regard to collaborating with group members, brought about as a result of playing during the play workshops, also relates to relieving stress; many students felt initial uncertainty at having to work in groups. Introducing play in the students' design process helped them to build momentum. Students felt energised by playing, and inspired to produce artifacts that were expertly designed, as well as fun to play with. Furthermore, playing with group members created a sense of camaraderie, which was also motivating. When students played with children, both during play research sessions (2020) and during play testing (2019 & 2020), they enjoyed the sessions and felt a sense of satisfaction. Students reported that it was rewarding to see the value of their products in a real-world application, and it was gratifying to see how their iterations improve products for their users. These interactions also helped to build momentum and encouraged students during the projects. By playing in the initial play workshops, many students reflected that they learned about their own play preferences. Moreover, the play experiences throughout the project gave rise to reflections regarding their styles of work, and what they might enjoy playing as adults. A couple of students, for example, noted that engaging in sensory play, or continuing to play while listening to a lecture, improved their focus.

The next consequence of interaction, challenging assumptions, came through often from the data. In the first instance, students learned about childhood development during the play workshop, as well as various types of play, which broadened their knowledge on the subject. Some students noted that they were surprised by what they learned during the workshop, and that designing for children seemed a lot more complex than they initially anticipated. Following the workshops, students' assumptions were challenged most during their primary research, as well as when play testing. Their engagements with children led many students to the conclusion that they had underestimated children, both in terms of their abilities, as well as their visual literacy. Learning, through playful iteration, about their designs from the children's perspectives also helped to challenge assumptions, and in doing so, resulted in more appropriate design solutions from the students. Play enabled

empathy for students in different ways. The first is that it helped to build bridges between team members, who interacted with each other in new ways through play. Secondly, play research sessions, such as those conducted by many groups in 2020, helped students to relate to children, and experience how they learn and play themselves. Like student S7'20 said, "play is also super useful in breaking down the perceived walls between you and the user because it levels the playing-field and acts almost like a universal language". During play testing, students needed to suspend their ideas of what was appropriate and observe the interactions of the children they were designing for. This process of iteration was humbling for some students, who reflected that they needed to shift their mindset away from one with a goal to the finish line, to one that embraces the process. Lastly, a consequence of introducing play in the student design process was that students were reminded of the broader value of play. This extends to the value of play in their own lives, as well as the importance of play in the context of schools and childhood development. Furthermore, many students indicated a desire to adopt a more playful approach in their own design process. The idea that students experienced a shift in their thinking during the project, as a result of playing, but also post-project completion, relates to Rice's argument that students need to undergo some form of transformation, referred to by Rice (2009:96) as "ontological change", for deep learning to occur. This is in line with Leclerc's (2017:202) assertion that:

> Play's ontological nature (self-actualization of individuals), its relevance as an agent of cultural exchange and development, its harmonization of competencies fostering creativity, enhance the explication of design's processes, and enrich the design activity, asserting its central place in the human experience.

The visualisation of my findings (Figure 42) illustrates how the student design process was influenced, specifically with regard to the collective case study in question, by the introduction of play in a design higher education context. As such, the visualisation also constitutes my proposed model for a play-fuelled pedagogy of design, which is detailed at the end of this chapter.

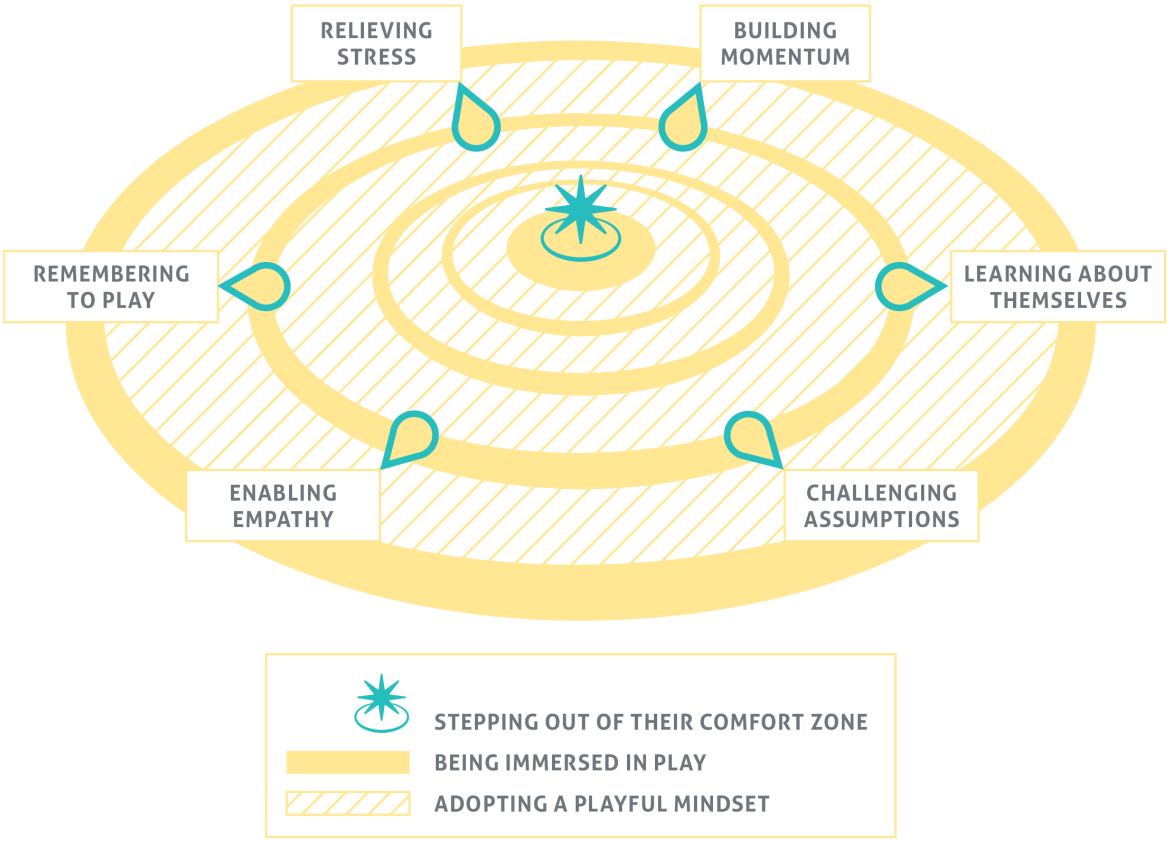

Figure 42: Introducing play in the student design process: a model for a play-fuelled design pedagogy

The context in which play was introduced in the case studies follows the signature pedagogy of design (Davis 2017:91), where the studio project frames the learning experience for students. Furthermore, the pedagogic style followed during both case studies is aligned with Davis' (2017:87) description of a "coaching pedagogy". As facilitators, we served to mentor students throughout the project, providing reflective prompts and nudges relating to scheduling and time management. In addition, facilitators would also provide feedback regarding the appropriateness of design solutions pitched by the students, ensure that their ethical approach was sound, and monitor their overall progress and morale. As a reminder of how the design process unfolded as an aggregate for the cases of 2019 and 2020, Figure 43 presents a summary of the student processes, side by side. The yellow ripple-circles denote the instances in which students engaged in play activities. The concentric circles expand to illustrate the ripple effect of play as part of the student design process.

As discussed in Chapter Five, the Design for Development project of 2020, in spite of its virtual platform, gave rise to more opportunities for play and play testing. This becomes

evident in Figure 43, where students engaged in play earlier on in the project process, owing to the ability to conduct rapid prototyping, as well as having access to forms of digital play. Nevertheless, in both cases, students arrived at a sense of ownership by the end of the projects, where play had been woven into their project process.

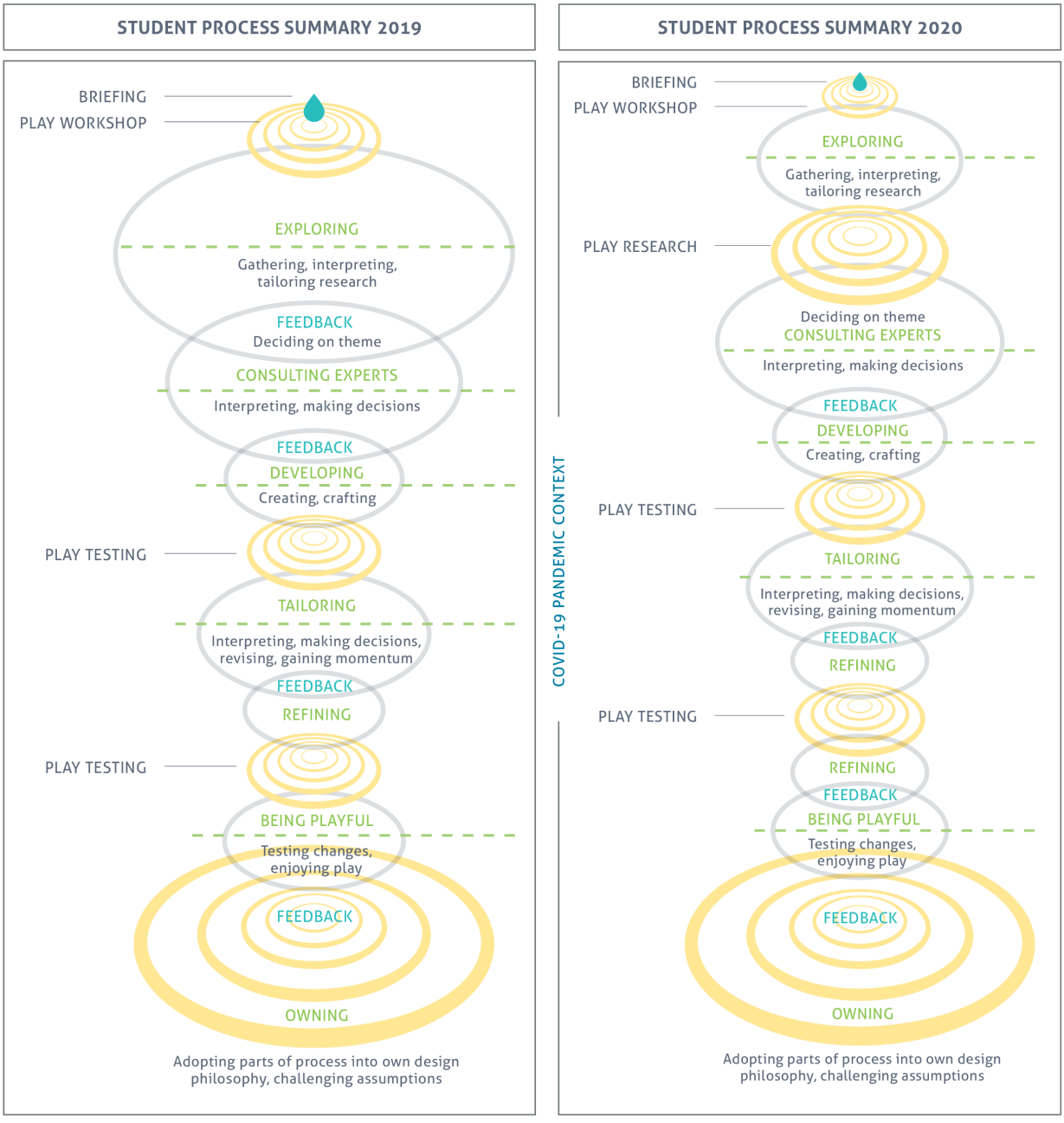

Figure 43: Summary of 2019 and 2020 student design processes, side by side

As presented in Table 1, Davis (2017) acknowledges various pedagogic strategies, that can be utilised when taking the approach of teaching *through* design (refer to Table 1 on page 28). These strategies include: scenarios, personas, analogical thinking, visualisation,

simulations and prototypes, and competing constraints (Davis 2017:171-183). Based on the findings from this collective case study, I propose that including play in the student design process could be employed as an additional pedagogic strategy. This strategy is one that is driven by play – both by being immersed in play, as well as adopting a playful mindset (as illustrated in Figure 42). As such, including play in the design higher education classroom allows for a pedagogic strategy that is fuelled by play, in essence a play-fuelled design pedagogy. The characteristics of a play-fuelled pedagogy have been unpacked in this chapter, by understanding how introducing play in design higher education influences the students' design process. To recap, while alternating between states of being immersed in play, and adopting a playful mindset, during the design process, students were able to: relieve stress; build momentum; learn about themselves; challenge assumptions; cultivate empathy; and be reminded of the benefits of play.

6.10 Reflections on practicing a play-fuelled pedagogy

As I have mentioned, my axiological perspective as a design educator aligns closely with Donald Schön's (1983) philosophy of being a reflective practitioner. Schön (2017:279) writes about a "reflective contract" that needs to be set up between a practitioner and a client. In this contract, Schön (2017:297) argues that a practitioner concedes to relinquish a certain amount of control or authority, typically associated with being "the professional" in the practitioner-client relationship. In the same way, the client concedes to adopt a more active role in the problem-solving process. Schön (2017:276) explains,

> [the practitioner] gives up the rewards of unquestioned authority, the freedom to practice without challenge to his competence, the comfort of relative invulnerability, the gratifications of deference. The new satisfactions open to him are largely those of discovery – about the meanings of his advice to clients, about his knowledge-in-practice, and about himself. When a practitioner becomes a researcher into his own practice, he engages in a continuing process of self-education.

Similarly, I propose that in the case of the facilitator-student relationship, introducing play in a design higher education context allows for a more equal playing field. This means that the facilitator, or design educator, also becomes a researcher into their own practice, and remains open to a process of self-education, enabled by reflecting in- and on-action while teaching. During the Design for Development projects of 2019 and 2020, we had the opportunity as facilitators to play with students and to participate in the design process. During 2019, playing in-person enabled students to see facilitators engaging in play, and being playful in ways they would not normally see in the academic context. The pandemic

context of 2020 had the unexpected result of highlighting the vulnerabilities of the facilitators, where they had to navigate new online and technological spaces, and learn with the students to operate within a novel environment. In addition, being involved in a project that champions play reminded me as an educator and designer to remain playful in my own approach, both in the context of the classroom and in my personal and professional capacities.

This purpose of this chapter was to present a critical, cross-case synthesis of the themes arrived at through the analysis of empirical data from the Design for Development projects of 2019 and 2020. This synthesis was summarised and visualised by means of a diagram (Figure 42) depicting states of interaction and consequences of interaction. Interaction in this sense refers to the way in which students interacted during their design process. Thus, this chapter serves to answer the main research question of this study, which is to explore and describe how introducing play in design higher education influences students' design process. Furthermore, Chapter Six proposes a play-fuelled pedagogy of design, informed by the findings of the study. Following this synthesis of the research findings, Chapter Seven of this study concludes the research. First, Chapter Seven provides an overview of the study, followed by a self-evaluation of the research based on the criteria of conducting case study research. Lastly, the strengths and limitations of the study are discussed, as well as opportunities for further research.

CHAPTER SEVEN:
CONCLUDING THE RESEARCH

Chapter Six comprised a critical cross-case synthesis of both cases in this collective case study research. The outcomes of Chapter Six included a critical discussion and visualisation of the empirical findings, as well as a proposed model for a play-fuelled pedagogy of design. Subsequently, Chapter Seven concludes the research; first, by providing an overview of the study, and second, by conducting a self-evaluation based on criteria for conducting case study research. Following this, the strengths and limitations of the research are discussed, as well as the contributions of the research. Lastly, recommendations for future research are provided.

7.1 Overview of the study

Chapter One of this study provided context for the research, by providing a background of the two student design projects in this collective case study. The study was also situated within the broader context of design higher education research in South Africa; and the intersection between design higher education, play and the student design process was highlighted to frame the research question. Chapter One thus highlighted the main aim of the study: to explore and describe how introducing play in the context of design higher education influences students' design process. Objectives flowing from this research question were: first, to explore and describe what was unique about the student design processes under investigation, when compared to popular iterative design processes; second, to explore and describe how students experience play as part of their design process; and lastly to explore and describe how these experiences manifest in tangible design outcomes. The research design supported the pursuit of meeting the objectives of the study and answering the research question. Adopting a constructivist approach, this study employed a collective case study research methodology. This included qualitative content analysis as a research method, to analyse the empirical data collected from the Design for Development projects of 2019 and 2020. Once both cases had been analysed, a cross-case synthesis concluded the research process.

Chapter Two comprised the literature review and conceptual framework of the study. The purpose of this chapter was to situate the research within a theoretical framework, relevant to the areas within which the study is situated, namely: design higher education, play and the student design process. As such, Chapter Two began by situating the study within the

broader field of design higher education. Owing to the pedagogic vantage point of the study, as well as the researcher's position as a design educator, Chapter Two also provided an overview of design pedagogy and pedagogic styles, as well as positioning the case studies within the BA Information Design programme. Following this, the concept of design thinking and, embedded within this, the iterative design process, was explored. This exploration was both with regard to its popular application, as well as its application in a design education context. The position of the designer within the design and design research process also formed part of this discussion. Lastly, Chapter Two provided a theoretical framework for play, defining play according to theoretical perspectives from the domains of early learning (Lego Foundation 2019; Aistear 2009), game theory (Sicart 2014; Salen & Zimmerman 2004), the rhetoric of play (Sutton-Smith 1997), the culture of play (Huizinga 1938; Callois 1958), childhood development (Gray 2013; Lego Foundation 2019), education (Aistear 2009; Gray 2013; Lego Foundation 2019), and curriculum development (Aistear 2009). The section on play was concluded by outlining a set of characteristics of play, adapted from these domains of theory. These characteristics of play stated that play is: free, joyful, exists in its own realm, socially interactive, intuitive, iterative, governed by rules, process oriented, immersive and meaningful.

While Chapter Two served to position the case studies within a theoretical framework, Chapter Three provided context on both cases in the collective case study. This was done first by providing background on the BA Information Design programme and its pedagogic aims: that is, to nurture designers as reflective practitioners, that can act as design citizens and follow a human-centred approach to solving wicked design problems. The design process followed by final year students in the BA Information Design programme was explained, and an outline of the project briefs from 2019 and 2020 helped to contextualise the cases. Striving for a richer discussion in the collective case study, the commonalities and differences between the Design for Development projects of 2019 and 2020 were unpacked next. Visual summaries of selected projects from both cases were included for clarity as part of this contextualisation.

Following the contextualisation of the cases in the collective case study, Chapter Four presented the research design of the study. The research design elucidated the philosophical underpinnings of the research, situated within a constructivist / interpretivist research paradigm. Moreover, the pragmatic application of the research methodology, as a collective case study, was explained. Following this, the way in which qualitative content analysis was employed as a research method to analyse the empirical evidence in the

cases, was clarified. My methodological approach for conducting case study research was aligned procedurally with Yin's (2018) recommendations, while referring to Cresswell and Poth's (2016) strategies for validating case study research. As such, Chapter Four outlined Cresswell and Poth's (2016) validation strategies, and substantiated the strategies selected to validate this research. Finally, Chapter Four provided clarity on the ethical considerations of this research.

The philosophical and operational foundations of the research were covered in Chapters One to Four of this study. Subsequently, Chapter Five presented a practical application of the research, comprising the individual analysis of both cases in the collective case study. This was done by presenting themes emerging from the qualitative content analyses of each case, and substantiating these themes with empirical evidence.

As the synthesis chapter, Chapter Six comprised the cross-case analysis of this collective case study research. Chapter Six thus considered the holistic analyses of both cases, to arrive at a synthesis of the data, integrated with the theoretical framework presented in Chapter Two. This synthesis resulted in a critical discussion of themes emerging from the cases, to answer the research question of the study. Hence, these themes were also visualised as a model for a play-fuelled pedagogy of design, to show how the emergent themes manifested during the students' design process. Side-by-side visualisations of how play influenced students' design processes in both case studies also provided a visualisation of these findings from the empirical evidence. Chapter Six was concluded by reflecting on my axiological perspective as design educator, as well as reflecting on the notion of practicing a play-fuelled pedagogy in design higher education.

7.2 Self-evaluation of meeting the criteria of case study research

As discussed in Chapter Four, this study makes use of a case study research methodology, and is informed by Yin's (2018) recommendations for conducting case study research. In addition, I refer to Cresswell and Poth's (2016) strategies on research validation, because of their focus on validation in the domain of qualitative research specifically. Cresswell and Poth (2016:384) frame "validation" as an attempt to evaluate the "accuracy" of findings in qualitative research; this is best evaluated from the combined perspectives of the researcher, the participants and the readers (or reviewers) of a study. As such, this section of the conclusion aims to demonstrate the accuracy of this research, as my own interpretation and representation as the author of a constructivist study.

7.2.1 Corroborating evidence through triangulation

The potential to interpret to multiple sources of information is one of the benefits of case study research (Yin 2018; Cresswell & Poth 2016). As such, interpreting multiple sources of information in this collective case study facilitated data triangulation, which afforded validity to the study. In particular, similar pieces of empirical evidence from the cases of 2019 and 2020 provided an opportunity for cross-case comparisons and enabled a richer discussion of the findings.

7.2.2 Discovering a negative case analysis or disconfirming evidence

Since the two cases under observation shared many similarities, finding pieces of alternative evidence was an important step towards ensuring the validity of the research. The fact that the Design for Development project of 2020 took place in the context of the COVID-19 pandemic had the unexpected benefit of providing points of intrigue in the research discussion. In particular, the way in which play was included in the student design processes between these years shed light on the agency of the students, as well as the potential that teaching innovations have to adapt within new or unforeseen circumstances. Furthermore, these points of difference served to illustrate how play was manifest in the student design process, despite differing means of access to play, and despite differing platforms used for the final project outcomes.

7.2.3 Clarifying researcher bias or engaging in reflexivity

Acknowledging my role as researcher in shaping or interpreting the presentation of the research was key to ensuring the validity of the findings. Wearing multiple hats with regard to my engagement with the case studies, necessitated critical reflexivity on the part of the researcher. As a co-facilitator of both projects, as well as an educator with eight years of prior teaching experience in the BA Information Design programme, it was important to acknowledge that my past teaching experiences would influence my interpretation of the data. Furthermore, having been involved with previous Design for Development projects, aside from those featured in this study, shaped my interpretation according to my teaching observations and experiences. Approaching the teaching process from the perspective of a reflective practitioner (Schön 1983) also meant that my academic curiosities influenced my observations while teaching the two projects in this collective case study.

7.2.4 Having a prolonged engagement and persistent observation in the field

As mentioned in the previous point, my involvement as project co-facilitator in both cases in the study, as well as prior teaching experience in design higher education, afforded me richer insight when it came to understanding the context of the projects. This experience also enabled me to interpret the empirical findings from a bird's-eye view, being able to consider the cases within the context of the broader BA Information Design programme.

7.2.5 Generating rich, thick descriptions

According to Cresswell and Poth (2016:389), providing rich descriptions allows the reader to assess the transferability of a study, based on detailed observations, descriptions or accounts of events under observation. The use of a qualitative content analysis as a research method allowed me to provide rich descriptions in the form of quotes from the empirical evidence, grouped according to themes as they emerged from the data. In addition to this, reflections and teaching observations supported findings from the empirical evidence. Having access to video recordings of class consultations for the 2020 case study helped me to form a detailed picture of the events and processes as they transpired. The sheer volume of empirical evidence that was generated during the Design for Development projects of 2019 and 2020 made it possible to present a rich and detailed account of both cases in the collective case study. Compiling this evidence as a "case study database[43]", as suggested by Yin (2018:113) is beneficial to the transferability of the study, as the documents present a collection of evidence that can be referenced by the reader or reviewer of the study.

7.3 Strengths and limitations of the study

A consideration of the strengths and limitations of the study grants an opportunity to demonstrate how the researcher has been successful in answering the main research question of the study. As a reminder, the aim of this study was to explore and describe how introducing play in design higher education influenced students' design process. A noteworthy strength of this study is the careful consideration of the research design. In pursuit of answering the research question, a constructivist / interpretivist research

[43] This case study database is included as Appendix B and C, and is accesible here.

paradigm, coupled with a relativist ontology, subjectivist epistemology, and the axiological approach of a reflective practitioner (Schön 1983), enabled a thorough and scientifically rigorous scaffolding to support the case study research methodology. A case study was also an appropriate choice as a methodological approach, coupled with a cross-case synthesis as an analytical strategy. This selection made sense because of the context and retrospective nature of the projects constituting the two cases, as well as the variety of evidence that was produced during these projects. Another strength related to methodological rigour is the manner in which the case study was conducted. Following Yin's (2018:242) recommendations, a chain of evidence was maintained throughout the study, and evidence was collated in a case study database. This is beneficial for transferability in case study research, and provides the reader with an additional means of validation. In addition to this, a holistic representation of both cases in the form of a case documentation invites interpretation on the part of the reader, which is also in keeping with the constructivist research paradigm. A third strength of the research relates to the way in which the research question was answered – by presenting a rich and nuanced exploration and description of how students' design processes were influenced by the introduction of play in the context of design higher education. Visualisations of the ways in which play influenced the students' design process, as well as a visual representation of the interaction of themes emerging from the empirical evidence, is another key outcome of the study. As a reflective practitioner and educator, my close involvement with the cases, from a pedagogic vantage point as well as on a personal level, has granted me the opportunity to learn new ways of engaging with students. In essence, I have learnt to practice a play-fuelled pedagogy of design, and can articulate the benefits and outcomes of such a pedagogy in accordance with how they emerged from this research. From a teaching and learning point of view, the study makes a valuable contribution by highlighting the ways in which introducing play in design higher education can have an impact on the student design process. In addition, rich insights from students regarding their experiences of play, as well as their experience of the projects, supports curriculum development. The fact that both cases were research-driven design projects, and that emphasis was placed on the documentation of the students' research processes, means that another strength of this study lies in the collation and collection of valuable research insights from students. In essence, this attribute of the study enabled students to be co-creators of meaning in the research process.

While close involvement with the cases is undoubtably beneficial when conducting case study research, as explained in the points on validity earlier in this chapter, there is also the caveat that interpretation could well be coloured by the proximity of the researcher. An opportunity exists when conducting qualitative research to corroborate research findings with participants, and to review findings once their feedback had been taken on board. This validation strategy explained by Cresswell and Poth (2016:386) was not a plausible option for this research endeavour, owing to time constraints. However, it does present an opportunity for further research to involve research participants by seeking their feedback on the findings, and to relay their perspectives on this interpretation. During both Design for Development projects in this study, the relationship between the design student and design educator was more coach-like, where the facilitator assumed the role of a mentor to the students. Nevertheless, there is a definite possibility that past experiences with more typical student-educator relationships could have influenced the students' responses, particularly with regard to responses in their reflection questionnaires. In addition, students participated in the design projects as part of the BA Information Design curriculum, which means that they were assessed on the project outcomes. Although students were encouraged to give candid responses in their reflection questionnaires, there is a chance that their responses could have been influenced by the dynamics of the higher education context. Again, this presents an opportunity to corroborate my interpretation of the research findings with students in future research activities.

A final limitation of the study is related to the opportunity to produce the projects designed by students, and make them accessible to the children, families and educators that they were designed for. Although it is possible to organise and coordinate the manufacturing of these products, the process is time consuming and would require an investment of time and capital. However, as many of the projects would be of great use in a real-world application, this is an endeavour worth undertaking in future.

7.4 Contributions of the study

As this research is situated at the intersection of the domains of design higher education, play and the student design process, its contribution is valuable to academic discourse in those three domains. However, being positioned primarily from a design education vantage point, the chief contribution of the research resides in an educational context. As such, the concept of a play-fuelled pedagogy of design, informed by the critical synthesis of empirical

evidence from the cases, as well as theory from the three intersecting domains, is the research innovation that this study presents. Articulating the concept of a play-fuelled pedagogy of design is directly related to answering the research question of the study – the model demonstrates how introducing play in design higher education influences students' design process.

The contributions of the study also became apparent in the process of meeting its research objectives. For example, the first objective was to understand what was unique about the student design process when compared to the widely adopted iterative design process. Laying a theoretical foundation to understand the iterative design process, and subsequently documenting summaries of the students' design processes, by means of analysing the empirical evidence, provided procedural evidence to demonstrate the way in which the students' processes unfolded. An aspect that was unique to the student process was that students demonstrated a great deal of enthusiasm for the research and play testing phases of the project. Many students also remarked that the project process was enriching, and that they engaged in their work without being bogged down by academic pressures. Thus, the student processes demonstrated playfulness, experimentation, curiosity and a malleable ebb and flow between the different phases in the process. In addition, introducing play in the student design process helped students to build momentum as they moved through the phases in the process. The human-centred focus of their research and design process was rewarding for the students, and they demonstrated empathy and connection with their target audience. Some students also reported that the project sparked their interest in pursuing careers focused on human-centred design. Insights from students regarding human-centred design philosophies aligns with the way in which the discipline of design is pitched in the BA Information Design programme. Another contribution of this study is thus to demonstrate that, through adopting a play-fuelled pedagogy of design, it is possible for students to experience design as a humanistic discipline, as thus to embed these values in their own design philosophies.

A second objective of the study was to explore and describe how students experienced the act of play as part of their own design process. The contribution flowing from this objective, was arriving at a model for a play-fuelled pedagogy of design, as the states of consequence and states of interaction depicted in the model are directly related to empirical evidence relaying students' experience of play during the design process. To recap, students step out of their comfort zone, either by virtue of a playful trigger, like a play workshop, or by engaging in play with their target audience. Thereafter, students move

between the other two states of interaction in the model, namely being immersed in play and adopting a playful mindset. The first consequence of interaction points to the way in which students experienced play in the design process as relieving stress. Next, students' assumptions were challenged during the process, both with regard to learning about their target audience, as well as with regard to their own interactions with play. Following this, introducing play in the design process enabled students to experience empathy. This allowed students to connect with their team members, build relationships with their target audience, and to revaluate their own assumptions about play and their target audience. Lastly, as a result of experiencing play as part of the design process, students were reminded of the value of play in a broader context. This encouraged students to adopt a playful mindset in their own design processes.

The last objective was to explore and describe how students' experiences of play were manifest in tangible design outcomes, which speaks to the contribution the study makes with regard to demonstrating deep learning on the part of students, by following a play-fuelled pedagogy of design. Design process and design practice is inextricably linked, and because of this, it is imperative that the vision of the designer flows through the process and is visible in the final product. The products showcased as part of both cases in this study demonstrate a genuine interest by students to produce designs of value to the humans they are designed for. Because play testing enabled students to test the value of their products with their target audiences, through an enriching and enjoyable process, the value of designing the products was transferred to the students as well. Thus, a play-fuelled pedagogy of design enabled students to play and learn experientially, and to see the value of this process manifest in project outcomes that they were proud of, and that could make a meaningful contribution to the lives of others.

7.5 Conclusion and recommendations for future research

This research sprung from a desire to understand how play could be meaningfully integrated as a part of the BA Information Design programme, and within this, as part of the students' design process. In addition, the question of how students might be enabled to learn experientially about the notion of human-centred design, and experience design operating as a humanistic discipline, drove the investigation. As a result of my prior teaching experience and involvement with the Design for Development project, I became curious as to how the introduction of play in design higher education influenced students'

design processes. An initial investigation on the theory of play, and of applications of play in design, pointed to many similarities between play and design. Moreover, this theoretical exploration revealed a gap in research with regard to understanding the benefits and possible integrations of play and playful learning within the context of higher education.

In concluding this case study research, I have demonstrated how the students' design process was influenced by the introduction of play, and I have articulated a model for a play-fuelled design pedagogy. The analysis of the empirical evidence from the cases of 2019 and 2020 highlighted that a play-fuelled pedagogy of design need not be relegated only to a specific application of play. That is to say, play can operate within a wide variety of circumstances, whether in-person, in a hybrid fashion, or digitally.

The study also demonstrated pragmatically how play was manifest in the student design processes by means of a cross-case synthesis. Seeing the analysis of this data as a visualisation (Figure 43) provides an opportunity to fine tune the integration of play in future Design for Development projects. As one of the benefits of this study is its contribution to teaching and learning, specifically in the BA Information Design programme, insights on how play drove the student design process can help to refine project planning. For example, creating digital prototypes, as well as using other methods that enable rapid prototyping, is more conducive to encourage students to engage in meaningful play from the onset of the project. Furthermore, the fact that students were enabled by access to digital play during the case of 2019, suggests that this approach gives students agency and allows them to play independently.

Another opportunity for future research that has emerged while conducting this research is to conduct a longitudinal study, with the aim of understanding how a play-fuelled pedagogy of design may have influenced their design practice as professional designers. As many of the graduates from 2019 and 2020 are currently working in the fields of design research, user experience design (UX) or are part of design projects that follow a human-centred design philosophy, it would be beneficial to understand how a playful approach to design fits into their work in a professional capacity, if at all.

Owing to the fact that both Design for Development projects required students to design for children, the brief essentially required to design play, through play. An opportunity for future research thus emerges to understand how a play-fuelled pedagogy of design could be applied in a different context. For example, students could be tasked to design a more corporate product, or to produce designs for an adult target audience, while following the

same play-fuelled approach to design. In conclusion, this study leaves the reader to imagine how a play-fuelled pedagogy might be extended to disciplines beyond that of design. This presents an opportunity for future interdisciplinary research, to understand how a play-fuelled pedagogy could relay benefits embedded in its practice, to disciplines that are traditionally further removed from the sphere of play. Considering the value of play in breaking down barriers, building relationships and enabling empathy, its integration with pedagogy in the context of higher education makes room for human-centred innovation.

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Appendix A: student project summaries 2019-2020

Design project outcomes: class of 2019

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
SHELLTER	**BOUNDARIES**	**BALANCE**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, DRAMATISED PLAY**	

SUMMARY

Shellter addresses the theme of appropriate boundaries for a child audience. The toolkit touches on the changing nature of boundaries, boundaries with others and personal boundaries. The metaphor of shells, and sea creatures with shells, is used to make the theme accessible to children. Activities include a storybook that introduces the theme and characters, a dramatic play board game that aims to build empathy and an app where children can build their own sea creature.

Changing nature of boundaries

Other children's boundaries

Children's own boundaries

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
MOON WHIZZ	**ANALYTICAL SKILL BUILDING**	**REPETITION**
TYPES OF PLAY INCLUDED	**MASTERY PLAY**	

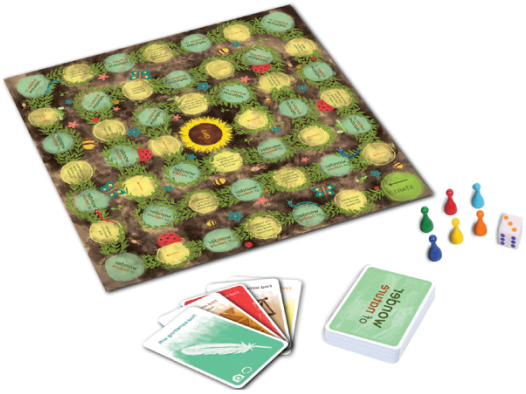
SUMMARY

MoonWhizz aims to develop analytical, strategic and critical thinking skills in children. Set in space, the toolkit comprises three mastery activities, namely: Take Off, Rescue Mission and Landing. In Take Off, a rocket needs to be balanced for the player to succeed; this is done through a card game. Rescue mission is a puzzle game aimed at improving logic and problem solving skills. The aim of Landing is to successfully land all rocket ships by solving equations, thus focusing on mathematics.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
WAIT A MINUTE	**PATIENCE**	**BALANCE**
TYPES OF PLAY INCLUDED	**SENSORY PLAY, BIBLIOPLAY, CREATIVE PLAY**	

SUMMARY

Wait A Minute is a toolkit that aims to teach children the value of patience and aims to combat instant gratification. Nature is used as a metaphor to show how growth happens over time and that results, although not always immediately apparent, are worth waiting for. Activities include a storybook, board game and worksheet that demonstrates the growth cycle of a plant alongside a practical activity. A creative play prompt to create insect characters from rocks is also included.



PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
ROOTS	**CULTURAL EDUCATION**	**UNITY**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, DRAMATISED PLAY, MASTERY PLAY**	

SUMMARY

Roots is an educational toolkit that aims to teach South African children about different cultures in a fun and interactive way. The toolkit includes a storybook with reflection prompts, a board game and a karaoke game that teaches children to sing the South African national anthem. Friendly characters and colourful illustrations are used to showcase the languages, clothing and artifacts unique to the cultures featured in the toolkit.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
FOE FICTION	**CONFLICT RESOLUTION**	**CONTRAST**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, DRAMATISED PLAY, MASTERY PLAY**	

SUMMARY

Foe Fiction is a toolkit that helps children to work through fictional problem scenarios to develop conflict resolution skills through play. A role-playing game teaches children how to identify emotions and express them in healthy ways - this activity includes a storybook, props, emotion cards and a facilitators guide. A biblioplay activity encourages children to build their own stories and see the consequences of their choices, while a board game encourages collaborative play.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
KABUSHA	**ENVIRONMENTAL RESPONSIBILITY**	**HARMONY**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, DRAMATISED, MASTERY, CREATIVE & SENSORY PLAY**	

SUMMARY

Kabusha champions harmony in nature by teaching children about our impact on the environment through play. The activities in the toolkit include a storybook, a boardgame, a scavenger hunt and a sensory play (playdough) activity. Each activity harnesses different kinds of play to deepen learning. For example, the scavenger hunt requires children to search for found objects in their homes in order to up-cycle them and complete creative challenges.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
THE EMPOWERPUFF GIRLS	**GENDER EQUALITY**	**BALANCE**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, DRAMATISED PLAY, BIBLIOPLAY**	

SUMMARY

The Empowerpuff Girls is a toolkit that aims to make young girls and boys aware that gender inequality exists, and to empower them to take action or change their thinking on the topic. Featuring female superhero mascots, the toolkit begins with a biblioplay activity and follows with a board game focused on character building and encouragement from peers. Lastly, children create their own cape and imagine a superpower during creative and dramatised play.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
IMAGIMOTION	**COMMUNICATION**	**REPETITION**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, DRAMATISED PLAY, CREATIVE PLAY**	

SUMMARY

Imagimotion aims to build communication skills in children, with a focus on improving vocabulary, emotional literacy and illustrating the concept of cause and effect, or reciprocity, in communication. A mastery play card game aims to widen vocabulary to include emotive and expressive language; a creative play activity allows children to build and draw faces to illustrate emotions, as well as act them out; and a board game illustrates the idea of cause and effect in communication.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
TASTE BUDDIES	**KINDNESS THROUGH FOOD**	**VARIETY**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, MASTERY PLAY, CREATIVE PLAY**	

SUMMARY

Taste buddies shows how food can be used as a means to foster connection and encourage kindness. A biblioplay activity illustrates how food varies across cultures and how kindness can be shown through food and hospitality. Monster Munchies is a food-themed memory game that encourages team work. Cooking With Friends, a stack of recipe cards, encourages children to make healthy snacks for themselves and their friends, by making use of creative and mastery play.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
GOING OVERBOARD	**EMOTIONAL REGULATION**	**BALANCE**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY, MASTERY PLAY, SENSORY PLAY, DRAMATISED PLAY**	

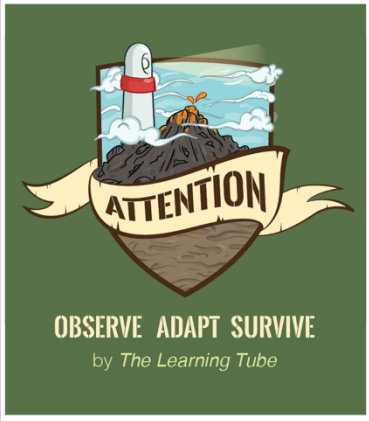
SUMMARY

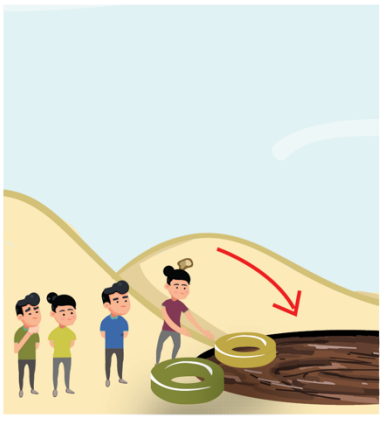
Going Overboard is a toolkit that emphasises the importance of balance when it comes to emotional regulation. Children are guided through a nautical adventure while they learn how to navigate the world of emotions, through biblioplay, an expressive dramatised play activity, as well as physical play activity, similar to Twister, that builds emotional vocabulary. A board game illustrates that space can be held for different emotional states in a fun and interactive way.

PROJECT NAME	PROJECT THEME	DESIGN PRINCIPLE
ATTENTION	**IMPROVING ATTENTION SPAN**	**BALANCE**
TYPES OF PLAY INCLUDED	**PHYSICAL PLAY, MASTERY PLAY**	

SUMMARY

The Attention toolkit aims to improve children's attention span and concentration abilities through an interactive role-playing survival game. This toolkit encourages collaboration, as competing teams complete challenges in order to survive. The inclusion of adventure themed physical games help to keep children immersed in play, while building critical thinking, team work and problem solving skills. This toolkit is well-suited to a group or classroom setting with outdoor play space.





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Taste Buddies: Megan Steyn, Johann Smith, Lizelle Erasmus

Going Overboard: Tessa Gough, Vivienne Watt, Linette Kleyn

Attention: Sanele Qwabe, Timothy Downing, Jordyn Coetzer

Design project outcomes: class of 2020

PROJECT NAME	PROJECT THEME
BOND	**EMPATHY AND EMOTIONAL INTELLIGENCE**
TYPES OF PLAY INCLUDED	**DRAMATISED PLAY, MASTERY PLAY**

SUMMARY

Bond is a detective themed app that aims to build empathy and emotional intelligence in children, by making abstract concepts more accessible through play, including role-play. The game 'Mysterio' was developed in its entirety for the purposes of the project; it is a role-playing, emotion-detecting game that builds children's emotional vocabulary, empathy and perspective taking skills. With varying levels of difficulty, children act out emotion words for their opponents to guess.

PROJECT NAME	PROJECT THEME
SCRIBE KNIGHTS	**STORY BUILDING AND PROBLEM SOLVING**
TYPES OF PLAY INCLUDED	**BIBLIOPLAY**

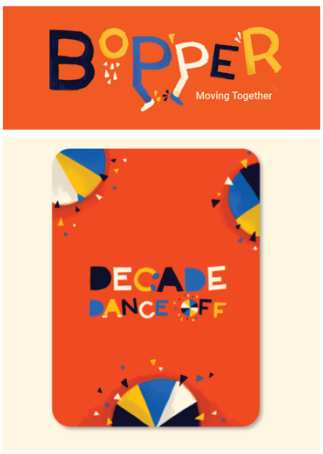
SUMMARY

Scribe Knights is an interactive story building game, where players make choices that affect the trajectory of the narrative. The player is presented with various conflict-related scenarios in the game that aims to challenge their creativity, emotional literacy and problem-solving skills. Once a story is completed, it can be replayed or read as a digital storybook.

PROJECT NAME	PROJECT THEME
BOPPER	**INTER-GENERATIONAL FAMILY BONDING THROUGH DANCE**
TYPES OF PLAY INCLUDED	**PHYSICAL PLAY, MASTERY PLAY, DRAMATISED PLAY**

SUMMARY

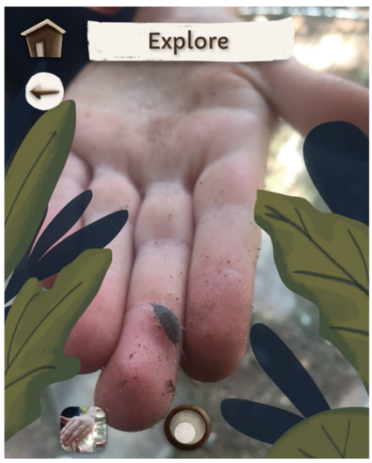
Bopper is an interactive app designed to strengthen inter-generational family bonds through dance. Designed to bring families closer together during the COVID-19 Pandemic, families can dance together virtually, completing various danced-themed challenges: some that evoke a sense of nostalgia for older family members and some that allow children to share their music with their families in a fun way. Dances can be recorded, shared and completed individually or together.



PROJECT NAME	PROJECT THEME
BUGBOX	**ENCOURAGING OUTDOOR PLAY, EMPATHY FOR NATURE**
TYPES OF PLAY INCLUDED	**PHYSICAL PLAY, SENSORY PLAY, MASTERY PLAY**

SUMMARY

Bugbox is an app that encourages children and their families to spend time exploring together in nature. Themed around the idea of collecting treasures, players can challenge each other to collect creatures or natural objects by finding them in nature and photographing them, to store in their 'boxables' bug box. Players can also request swop-outs from their friends and do not have to be located in the same physical space in order to play together.



PROJECT NAME	PROJECT THEME
BIBLI	**BUILDING LITERACY THROUGH PLAY**
TYPES OF PLAY INCLUDED	**MASTERY PLAY**

SUMMARY

Bibli is an app that develops reading skills in an engaging way through the use of augmented reality. Children are guided through an interactive world with various levels and must complete challanges to collect a set of characters throughout the game. The challenges are set in their real-life environment - characters hide behind couches and reading activities are set in the augmented reality playspace. The app includes poems, read-aloud prompts and spelling excercises.

PROJECT NAME	PROJECT THEME
OVERTONE	**ENCOURAGING CONNECTION THROUGH A COLOUR HUNT**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, PHYSICAL PLAY**

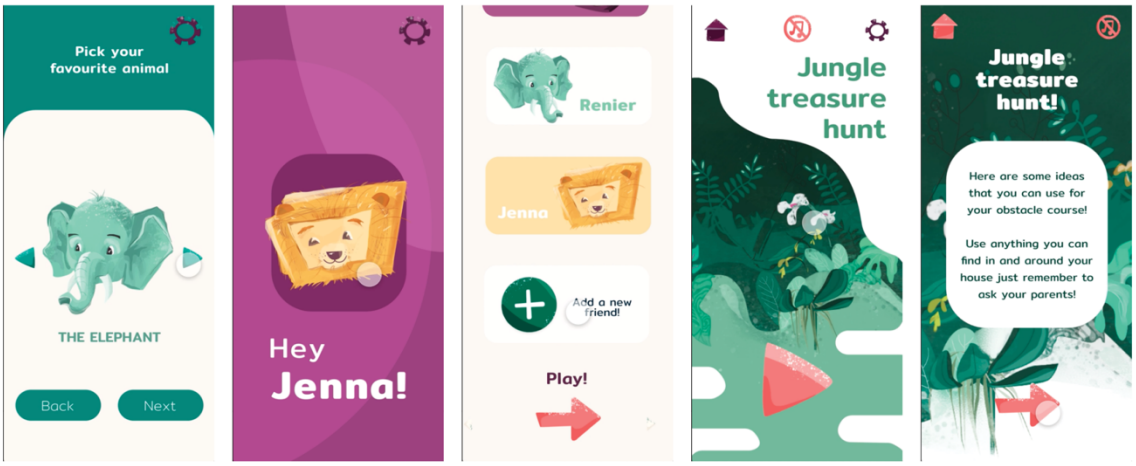
SUMMARY

Overtone encourages connection between children and their friends or family members, while engaging them off-screen by means of a colour hunt. Competitors search for colours strategically to build their coloured bases and to destroy an enemy base. Colours are captured via a phone camera; this also aims to instil mindfulness and connection to one's immediate environment.

PROJECT NAME	PROJECT THEME
TRACK & TRAIL	**FAMILY BONDING BETWEEN CHILDREN AND PARENTS**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, PHYSICAL PLAY**

SUMMARY

Track & Trail encourages family bonding between parents or caregivers and children by making use of physical play challenges. The app features various characters and adventure-based, jungle-themed storylines where players are required to build and complete physical obstacle courses with objects that they find in their environments. An emphasis on physical play encourages players to get moving in an indoor or outdoor environment.



PROJECT NAME	PROJECT THEME
MOODO	**EMOTIONAL LITERACY AND COMMUNICATION**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, DRAMATISED PLAY**

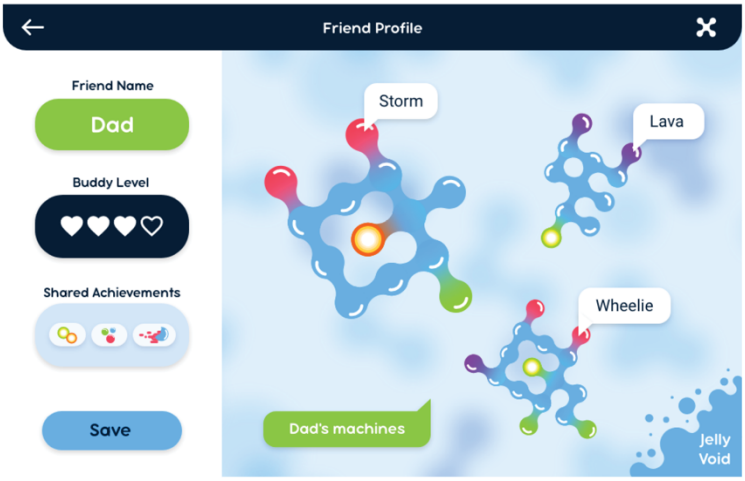
SUMMARY

Moodo is an app that aims to build emotional literacy in children and their parents. A series of tiered challenges allows players to create an emotive character, to learn about identifying emotions, to understand the emotions of yourself and others, and to process (or "tame") your emotions.

PROJECT NAME	PROJECT THEME
JELLY BEAN	**DEVELOPING PROBLEM SOLVING AND ABSTRACT THINKING SKILLS**
TYPES OF PLAY INCLUDED	**MASTERY PLAY**

SUMMARY

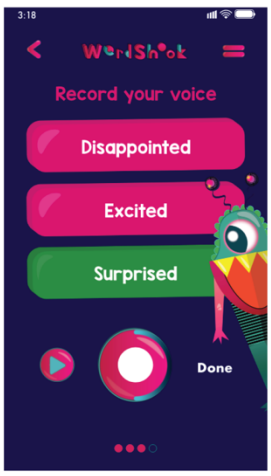
Jelly Bean is a game that encourages absract thinking and aims to build problem solving skills. The game makes use of jelly-bean shaped objects that can be combined to build various machines with different skills. The aim is to create machines that can complete a set of challanges successfully. The game also has a multi-player option and can show how your friends' machines move through the virtual world, dodging obstacles or working together to solve problems.

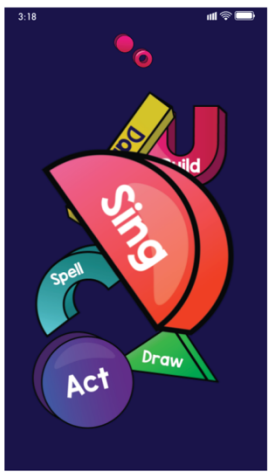


PROJECT NAME	PROJECT THEME
WORDSHOOK	**EMOTIONAL LITERACY AND COMMUNICATION**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, DRAMATISED PLAY**

SUMMARY

WorkShook is a game that aims to build children's emotional vocabulary and to improve communication skills. Players are required to communicate various emotive words by means of singing, dancing, spelling, drawing, acting or building these words. At the end of the round, players score each other based on the manner in which concepts were communicated.

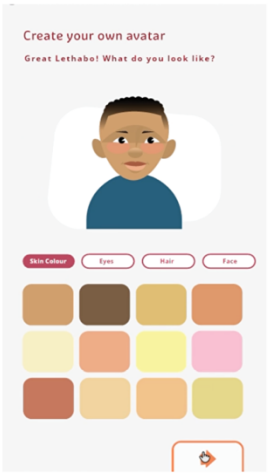


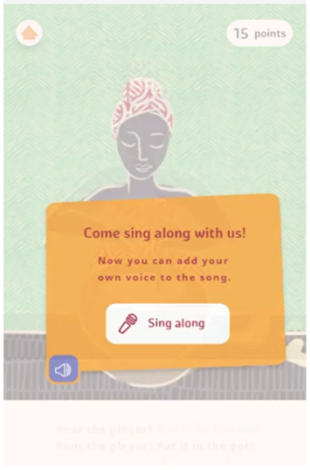


PROJECT NAME	PROJECT THEME
LAPA	**ENCOURAGING CONNECTION THROUGH STORYTELLING**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, BIBLIOPLAY, DRAMATISED PLAY**

SUMMARY

Lapa is an app that encourages connection between parents and children through sharing traditional African folk tales. The app includes traditional tales that celebrate heritage and culture; stories can be acted out, sung, or read aloud by children and adults. The app also builds reading skills and is tiered in difficulty for beginner to intermediate readers.

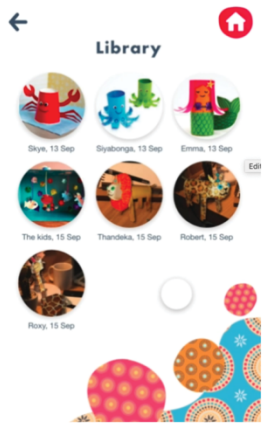




PROJECT NAME	PROJECT THEME
BUILDING BONANZA	**TEAM BUILDING THROUGH CRAFT**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, CREATIVE PLAY**

SUMMARY

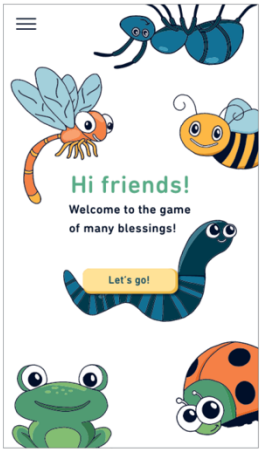
Building Bonanza is designed to be used in a low-tech environment and encourages connection between children and caretakers. Various craft challenges need to be completed by more than one player, to create a shared sense of achievement. The craft activities make use of upcycled household materials and inexpensive supplies and are well suited to home or classroom environments.

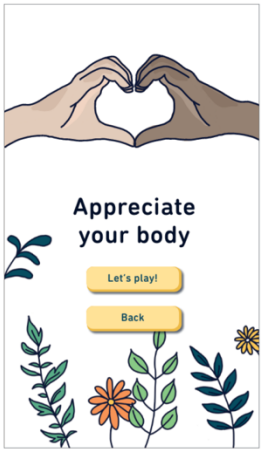


PROJECT NAME	PROJECT THEME
GROWIT	**GRATITUDE AND MINDFULNESS**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, CREATIVE PLAY**

SUMMARY

Growit aims to instil a sense of mindfulness and gratitude in parents and children, by connecting them to nature and each other through a series of creative play activities. The app also includes prompts for reflection, which encourages discussions of thankfulness between parents and children.

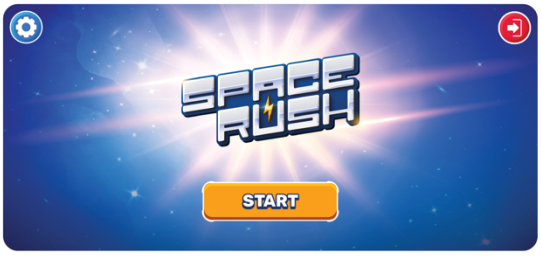


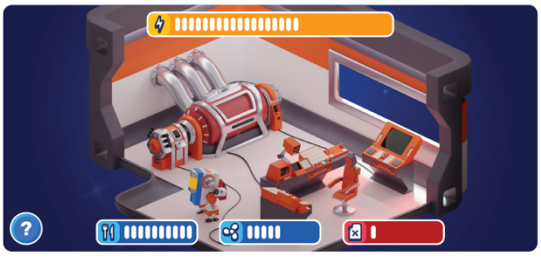


PROJECT NAME	PROJECT THEME
SPACE RUSH	**TIME MANAGEMENT**
TYPES OF PLAY INCLUDED	**MASTERY PLAY**

SUMMARY

Space Rush is a strategic mastery game that aims to teach to children about time management with the guidance of their co-players (parents or guardians). The intent of the game is to learn to juggle multiple tasks simultaneously and to prioritise rest as a means to refuel and recharge your batteries.





PROJECT NAME	PROJECT THEME
SEEK A CREAT	**EDUCATION AND EMPATHY SURROUNDING DIABETES IN CHILDREN**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, OUTDOOR PLAY**

SUMMARY

Seek A Creat aims to educate children and parents about diabetes in children, focused specifically on Type 1 Diabetes. The game allows children to create and care for avatars, while earning "empathy points" as they complete a set of tasks. The inclusion of an augmented reality element encourages children and parents to spend time outdoors and to engage with their immediate environment.

PROJECT NAME	PROJECT THEME
MECO	**ENVIRONMENTAL CITIZENSHIP**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, OUTDOOR PLAY, PHYSICAL PLAY**

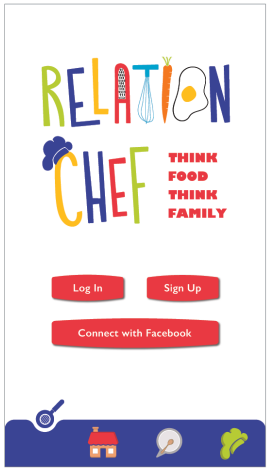
SUMMARY

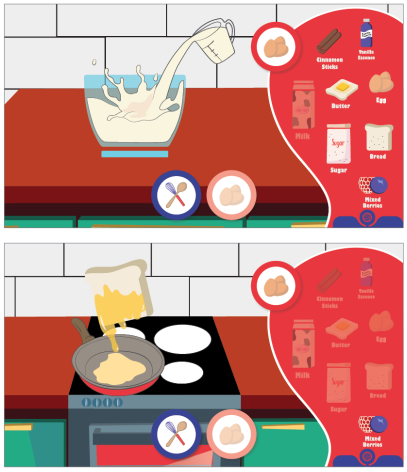
Meco is a game that allows players to complete a set of challenges designed to increase environmental awareness and build the concept of environmental citizenship. Each challenge is designed to clean up and benefit the environment; intrinsic and extrinsic motivational tools are used to keep players engaged in the challenges and add to the enjoyment of the game.

PROJECT NAME	PROJECT THEME
RELATION CHEF	**CONNECTION THROUGH COOKING**
TYPES OF PLAY INCLUDED	**MASTERY PLAY, CREATIVE PLAY**

SUMMARY

Relation Chef aims to build connection between parents and children by allowing them to cook together. The app provides recipes that can be completed by children under adult supervision, by following the visual prompts on screen. Children and parents also have the option to schedule 'cooking dates' in the future and to share images of their creations with friends.





Bond: Dian Labuschagne, Kyla Jansen van Rensburg

Scribe Knights: Nele Schäfer, Thomas Naudé

Bopper: Nadine Evans, Michaela Hancock

BugBox: Cari Witthöft, Marguerite Turpin

Bibli: Sarie Louw, Danielle Schröder

Overtone: Jan-Dirk Visagie, Luc Garrioch

Track & Trail: Melissa Janse van Rensburg, Sarah Thompson

Moodo: Suzanne van den Heever, Tashweena Heetun

Jelly Bean: Dylan Beangstrom, Daniella Mosca

WordShook: Jhani Scheepers, Charlene Raath

Lapa: Dineo Sebona, Tumi Mamabolo

Building Bonanza: Henriette Botha, Mel Muller

Growit: Elouise van Rensburg, Tinette Maree

Space Rush: Kaylin Naidoo, Ian Ramkrishna

Seek A Creat: Kayleigh Ellerbeck, Dorothy Dick

Meco: Natalie Comrie, Callum Gericke

Relation Chef: Tamica Scrivens, Riaan Greeff

Appendix C: Example of letter of informed consent

INFORMED CONSENT FORM

Dear Participant,

I am inviting you to participate in a qualitative research study, titled ***Introducing Play in Design Higher Education: A South African Case Study.*** The details of the research are provided below. However, if you would like additional information about the research, kindly contact me or Dr Fatima Cassim, my primary supervisor.

1. RESEARCHER

Mrs Marguerite van der Merwe (Doctoral candidate, Information Design)
School of the Arts, University of Pretoria, South Africa
Cell: 074 281 7841
Mail: botha.marguerite@gmail.com

2. SUPERVISORS

Dr F Cassim
School of the Arts, University of Pretoria, South Africa
Cell: 072 238 7261
Mail: fatima.cassim@up.ac.za

Dr Karen van Zijl
School of the Arts, University of Pretoria, South Africa

3. PURPOSE OF THE RESEARCH STUDY

The goal of this research is to conduct a case study on the Design for Development project taught as part of the IOW 400 module in the Information Design curriculum, facilitated by Dr Fatima Cassim, Marguerite van der Merwe, Dr Karen van Zijl and Megan Ribbens. The case study aims to understand how play can be integrated in design higher education as a meaningful part of the design process. Furthermore, the study explores how incorporating play in a design education context may strengthen a 'design thinking' culture, which is in-keeping with the notion that design can be employed as a dynamic and flexible problem-solving process beyond the confines of the discipline. To this end, students' participatory design process (by way of written reflections, rationales, teaching observations and recordings of classroom consultations) and the result thereof (namely creative interventions in the form of design toolkits, using print and/or screen-based media), completed for an Information Design project will be used to support the above exploration. The research forms part of my PhD study and is being conducted to gain a better understanding of the value that including play in the design process can provide, particularly in the context of higher education. Although the benefits of play have been explored extensively in the field of early childhood development, there is room for greater understanding of its impact when introduced in the context of higher education. A better understanding of the benefits that play can provide when including it in the context higher education may also contribute to future curriculum development and improvement.

4. EXPLANATION OF PROCEDURES:

Although all students enrolled in the IOW400 module are required to complete the project, you may choose not to give permission for me to use your data in my research. Your choice in this regard will have no influence on your assessment or on our interactions during the project. Should any student in a group not give consent for their work to be used in the study, the group work component will be excluded from the research. However, individual reflection essays from consenting group members may still be used.

All project data, including rationales, reflections, process work and the final project outcomes (all work handed in as part of the project and process) will be analysed to form a thorough understanding of the project process. If permission is granted, all student consultations with lecturers will be recorded, by making use of the Zoom platform's recording function, transcribed and analysed by me to be included in my research. The aimed completion of all data collection is December 2022.

Participants can be assured that all written rationales, reflections and recorded data from consultations will be treated with strict confidentiality and no personal details, should there be any, will be revealed. However, with the permission of participants, particular students will be acknowledged (should they wish) in the event that visual examples of their work are shown.

5. BENEFITS OF THE RESEARCH STUDY

A better understanding of the student design process could be helpful for curriculum development in design higher education, specifically in a South African context at the University of Pretoria. Furthermore, insights gleaned from student consultations, reflections and process documentation would provide a better understanding of the student experience during a project process: the benefit of this is that it enables student involvement in the research process in the hopes of bettering the teaching and learning experience for students and educators. As a research output, this PhD thesis contributes to the discourse of design education research by distributing new knowledge on the topic. Additional outputs from this research, such as conferences presentations, research publications (like articles, book chapters or other official research outputs) also contribute to the discussion of the value of including play in education, particularly in the context of higher education.

6. VOLUNTARY PARTICIPATION AND PARTICIPANT'S RIGHTS:

Although the researchers are asking your permission to be a part of this research, it does not obligate you to be a participant. Your participation is voluntary. You will be free to withdraw your participation at any point, and will experience no negative consequences as a result of your withdrawal.

7. RISKS INVOLVED IN THE STUDY:

There are no foreseeable risks or discomforts anticipated from your participation in this study. However, should you feel that there are any moments during our consultation sessions that you wish to exclude from the research, you are welcome to request that I exclude it from the study. You may also choose to withdraw your consent to participate at any point you may feel uncomfortable.

8. CONTACT PERSONS

If any participant wants more information about this research, he/she may contact the project leader or primary supervisor listed above.

9. CONFIDENTIALITY

Information gained from this study will be stored securely at the University of Pretoria for a period of fifteen years from the time of publication of the PhD thesis. Your name and any other identifying details will not be published in this study without your permission and you can be assured of confidentiality ad privacy in this regard. Nonetheless, the coded results of the research may be published in the PhD thesis, as well as other academic outputs, as the dissemination of the knowledge obtained may add value to the design discipline, in particular to the domain of design higher education. An understanding of student thoughts, approaches and design processes may be of value in improving design curricula.

10. CONSENT

I, _____, have read and I understand the provided information. I have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw my consent at any time, without giving a reason and without any implications. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Signature of participant: _____

Signature of researcher: _____

I hereby give my permission to participate in this research project in the following ways:

I give consent for class consultations/ discussions that I am part of to be recorded using the Zoom platform.

☐ Yes ☐ No

I give consent for my participation in the class consultations/ discussions, as per the transcripts, to be included in the research.

☐ Yes ☐ No

My name and other identifying details may be included in the study.

☐ Yes ☐ No

I wish to be acknowledged if any visual examples of my group's project are used.

☐ Yes ☐ No

This document was signed at _____ on the _____ day of _____ 2022.

PARTICIPANT'S NAME: ……

PARTICIPANT'S SIGNATURE: ……

RESEARCHER'S SIGNATURE: …… **MRS M VAN DER MERWE**

Appendix D: Permission letter from Professor Lize Kriel

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

School of the Arts
Visual Arts

Humanities 100. Since 1919

13 April 2021

Deputy Dean: Research and Chair: Ethics Committee
Faculty of Humanities

Dear Professor Pikirayi

Departmental consent: PhD research of Ms Marguerite Botha
Title of study: Introducing play in design higher education: a case study

This letter serves to confirm that Ms Marguerite Botha's research for her doctoral studies will draw on her work as parttime lecturer in the Information Design Degree programme together with her supervisor, Dr Fatima Cassim. Ms Botha's work will contribute to the future vibrancy of the programme and will play a role in future curriculum development as much as it draws on previous experience. From my position I see no conflict of interest and I can confirm that the PhD study has the full consent of the Information Design staff and the Visual Arts programmes more broadly.

Most cordially

LKriel

Prof Lize Kriel
Chair: Visual Arts

University of Pretoria, Private Bag X20
Hatfield 0028, South Africa
Tel +27 (0)12 420
Email:
www.up.ac.za

Appendix E: Design for development project brief 2019

UNIVERSITY OF PRETORIA
FACULTY OF HUMANITIES
SCHOOL OF THE ARTS

Project:	Information Design 400.4
Project leaders:	Fatima Cassim & Marguerite van der Merwe
Play therapists:	Karen van Zijl & Megan Ribbens
Dates:	29 April – 27 May 2019

Design for development

Teaching children creative problem-solving and design thinking skills through design principles

PROJECT OVERVIEW

This project is aligned with ideals pertaining to design not only as a commercial enterprise but also as an enterprise that serves society with a view towards building their capabilities / developing their skills-set; to this end, the project aims to provide citizens, specifically children between the ages of 8 to 12 (i.e.: senior primary level), with a toolkit that focuses on design elements and principles as a point of departure to nurture their creative problem-solving skills. Hence, the toolkits must be designed to engage children in a way that will instill a design thinking mindset in them, which they can subsequently use as a mode of reasoning for problem-solving purposes in their daily lives.

Following from the above, the overarching aim of this project is to inspire you to become a communication designer who will make a meaningful contribution to society through strategic design. Accordingly, the underpinning ethos of this project is the view that Communication or Information Design can facilitate positive social change in a local context, specifically with regard to civic responsibility and, by extension, children's development through experiential learning.

The following are some key ideas of the theme of design as a social practice that pertain to this project:

Project intent is:

Human-centered – involving / considering the end-user throughout the design process

Project strategy is:

Interventionist – search for change and improvement of existing capabilities
Relevant – focus on the real and immediate needs of children, immediate beneficial impact of design on the daily lives of children
Accountable – need for the concept to be understood, adopted and acted upon by end-users, sustainability of implementation

Project process is:

Ethical – in terms of the process incorporating participation with potential end-users and in terms of its research orientation, through which issues of responsibility and accountability are addressed.

Overall, the aim of the project is to design a creative intervention that can be used by children, either amongst themselves or with their parents and/or other facilitators (such as teachers). You will need to work in groups to develop an educational 'toolkit' that is aligned with the project theme, and will incorporate educational

tools and activities, projects, games, etc. for children between the ages of 8 and 12. You are urged to be mindful of this particular age group when exploring and choosing one of the following design principles:

- Contrast
- Emphasis
- Repetition and pattern
- Variety
- Proportion / Scale
- Rhythm and movement
- Balance
- Harmony and unity

Toolkits should consist of a number of educational activities (with a comprehensive set of instructions) that could take the form of a board game, performances, participatory activities and so forth. The intention is that these educational kits should serve as a prototype that may have the potential to be further developed and produced. It is therefore of utmost importance to consider the production and cost implications of your toolkit. Consider one-colour printing instead of full-colour for instance, and make strategic choices in terms of format, paper, packaging etc.

The project requires that you develop educational tools, projects and/or activities for young learners and where possible, test these ideas with children (with the aid of a parent/guardian/teacher) and/or a child expert. The purpose of user testing research is to ensure that your solutions are pitched at the right level, fun to engage with, and appropriate in terms of the learning objectives.

PROJECT INSTRUCTIONS

You will be divided into 12 groups for this project (11 groups of 3 students and 1 group of 4 students). Within these groups you will need to familiarise yourselves with your design principle and decide on a real life application. For example, the principle of unity can be linked to the children's understanding of cultural diversity.

Subsequently, you need to develop an overall identity / look-and-feel for your group's 'toolkit'. You will need to liaise with your target audience in order to come up with a suitable solution that is aligned appropriately with the age group and your chosen theme.

You will be required to conduct thorough research on your toolkit's theme through secondary research (this includes consulting books, magazines, websites, etc.) and primary research if possible (this includes speaking to education experts, designers and any other relevant professionals). If and when primary data is necessary for any group, examples of questionnaires will be provided for purposes of the initial design research phase at the beginning of the project.

Once you understand your toolkit's theme with its educational needs, you will be required to engage with the various users in the development of your concepts. You may also need to liaise with other relevant individuals or experts who may shed light onto the context, content identified or proposed educational solution (such as teachers, child psychologists, play therapists, etc). While guest lectures with relevant professionals will be facilitated, you will also have to take responsibility for your own research and design process. Your action research process and findings need to be thoroughly documented in a process document. Furthermore, it is essential that you include reflections on your process and experiences throughout the project, as this will

make you more receptive and mindful about your own growth and learning. The template for the process book will be made available to you in class.

You will ultimately be required to translate your research and reflections into an appropriate, packaged, INFORMATION DESIGN product, with the aim of providing an engaging and experiential learning environment for children. Keep in mind that regardless of the nature of your solution, it must be appropriate to the context/users, feasible and ultimately, sustainable.

PROJECT AIM & OBJECTIVES

- To cultivate your awareness of broader socio-cultural and educational issues, as well as the challenges faced in environments that you may not necessarily be familiar with.
- To inspire you to realise your power as a designer and your potential to make a difference in the world.
- To develop your ability to collaborate with other professionals and end-users and to work in teams.
- To develop your understanding of design problems as complex and multi-faceted.
- To develop your understanding of socially conscious design and sustainable design outputs.
- To develop your understanding of design as an iterative process, requiring various stages of research and prototyping.
- To be able to carefully and critically consider production costs.
- To develop your research, strategic thinking and design articulation skills.
- To improve critical thinking skills and to objectively analyse your own work outcomes and processes.

PROJECT DELIVERABLES

i. Process documentation:

For the duration of the project, each group will be required to keep a log of all manner of documentation generated in the research and design process. Each group will need to keep a file for this purpose. As mentioned previously, a template will be provided for each section of the process book; this template will then need to be populated collectively by the respective groups.

A. Initial research on topic

- A detailed exploration of the design principle and real life application that your communication toolkit addresses.
- Both secondary research (information that you gather from credible published sources) and primary research (first hand research that you conduct such as interviews and any other correspondence).
- Relevant statistics, graphs and other visual explanations in order to support and validate the importance and relevance of your chosen area of application.
- Proposed educational content for specific target audience / age group.
- Include a list of sources consulted (mere print outs of secondary research documents will not suffice – synthesise and integrate the information in your own research).

B. Visual identity development

- Your project development starting with the conceptualisation and design of an appropriate identity.
- Visual language to be used for the visual design of the respective toolkit components.
- Strategic consideration of a supporting organisation's branding in your visual identity (if and where necessary).

C. Toolkit development and prototyping

- Conceptualisation of individual toolkit activities (provide a clear indication of who has worked on what).
- Integration of all activities as a meaningful, thematic package.
- Thorough and meaningful documentation of prototype development and testing, including visual documentation (i.e. photos).
- An explanation of the way in which your solutions (both group and individual) strategically address the educational need.
- Evidence of the effectiveness of your toolkit in meeting the project aims.
- Financial feasibility of your concept and product/system.

D. Rationale

- Provide validation of the relevance, appropriateness, usefulness, usability and desirability of your solution with regard to the intended user/s. Provide adequate clarification / proof that your solution does indeed fulfill its design intent. This rationale should not exceed 2 A4 pages (11 pt, 1.5 line spacing).
- Along with the tangible product, you are required to submit a clear outline of the implementation of your solution (i.e. a description of the facilitation of toolkit activities) in real life circumstances such as a classroom.

E. Reflection

You will be provided with guiding questions to answer for the reflection component of the process book. While reflection-in-action forms a key part of the design process, this formal reflection component will serve as a reflection-on-action about your individual design process, your learning curve, your feelings, etc. Accordingly, your reflections must demonstrate:

- Critical thinking skills
- Generation of own knowledge (insight) directly tuned to practice
- Evidence of internal dialogue

ii. Tangible information design solution (toolkit):

Depending on the concept you developed by linking a design principle with a real life application, your final toolkit can take on a variety of forms. The form/shape/size/material of the toolkit package will be dictated by the concept as well as the individual activities in the toolkit. You are not restricted in terms of media and the final activities could utilise printed material, 3D constructions and/or digital media, if appropriate. Due consideration needs to be given to the instructions for using the toolkit (i.e. a parent's manual, etc.)

A mock-up of the final deliverable needs to be submitted as well as a professionally presented vertical narrative. Please note that owing to the collaborative nature of the project, group marks and individual marks will be assigned (please refer to page 5).

iii. Presentation:

Each group must present their toolkit package and individual activities, verbally with appropriate visual aids to the on the day of the digital deadline. This presentation will be formally assessed. Be sure to present a brief summary of your research process, concept and toolkit in a comprehensive and eloquent manner. The presentation is assessed from a content point of view (clear description of educational aims, convincing motivation and feasibility statements), as well as from a structural and delivery point of view. Further guidelines for this presentation will be provided during the course of the project.

PEDAGOGIC OBJECTIVES

The aim of the project is for students to familiarise themselves with the educational goals of the project; this includes understanding the topic as well as the target audience. In terms of design practice, students will therefore need to be able to collect, organise and design the information in an accessible and engaging manner.

To this end the intention of this project is to explore design as it is positioned within a broader framework of contemporary culture. As mentioned earlier, attention is paid to fostering an understanding in students of design as socially and environmentally responsible practice. To this end, the role of design is explored from a more expansive perspective, where consideration is given to the multiple dimensions of design, beyond its function as commercial enterprise. Furthermore, the intention of the project is to give the students an opportunity to work towards community engagement, which in turn is a valuable experience in order for deeper learning and to promote and develop social responsibility and awareness amongst students. These objectives are in keeping with the goal of the Information Design course, i.e.:

> to foster and nurture in students "a people-oriented attitude as well as a deep rooted understanding and mastery of a set of discrete skills in design thinking and making. This attitude and understanding, if applied in service of human beings and from the perspective of being human may ultimately contribute towards generating a culture of designers that pursue the 'global good' in all their endeavours" (Information Design 400 Study guide 2017).

ETHICAL CONSIDERATIONS

Each student needs to complete and sign the National Child Protection Register form and submit it together with a certified copy of their ID or passport at the onset of the project. The submission of this documentation is mandatory when working with children as part of a community engagement related project. Furthermore, the lecturers and play therapists will ask you to complete an informed consent form that they have compiled for research purposes. Essentially, the aim of the research is to explore the potential of information design build problem-solving capabilities, make new meaning, and encourage play and reflection through design for development. To this end, students' creative interventions (in the form of design toolkits) will be used to support this theoretical exploration. Students' process books will also be consulted to support the theory about design for development as well as social innovation**.**

ASSESSMENT CRITERIA

Your project will be assessed using the following criteria:

- Thorough understanding and implementation of appropriate research methods
- Depth of research and analysis of findings
- Evidence of a logical and systematic decision making process
- Conceptual feasibility of proposed solution
- Financial feasibility of proposed solution

- Efficacy of the proposed solution
- Creativity/innovative thinking
- Appropriateness of visual articulation in terms of users' profile
- Evidence of development through an iterative design process of 'prototyping'
- Functionality and usability with regard to the users' profile
- Application of design principles (i.e.: to the design deliverables)
- Coherence and logic of presentation, both visual and verbal
- Level of execution/craft
- Depth of reflection
- Teamwork
- Time and project management
- Professional conduct

MARK BREAKDOWN

a) Group (70%)
    a. Process documentation
    b. Toolkit (identity and package)
    c. Presentation
b) Individual (30%)
    a. Toolkit activity
    b. Peer assessment
    c. Reflection workbook

IMPORTANT DATES TO DIARISE

Refer to the project schedule below but please diarise the following important dates in the meantime:

Briefing	:	29 April
Play therapy workshop	:	30 April
Digital deadline / Presentation	:	27 May
Print and prototype deadline	:	10 June

READING MATERIAL

Organisations / campaigns / conferences / videos to consult:

- Taking Design Thinking to Schools (http://web.stanford.edu/dept/SUSE/taking-design/)
- 2010 International conference proceedings on 'Designing for children' with a focus on 'play and learn' (http://www.designingforchildren.net)
- Center on the social and emotional foundations of early learning (useful resources despite the younger target audience) (http://csefel.vanderbilt.edu/resources/strategies.html)
- "The Principles of design" - https://www.youtube.com/watch?v=ZK86XQ1iFVs
- "Why art is important" I Katerina Gregos I TEDxGhent 2014
- "Do schools kill creativity?" I Ken Robinson I TED2006

Books and articles:

The following articles will help you to better understand the theme as well as the social and environmental orientation of this project.

Bennett, A. 2012. *Engendering Interaction with Images*. Bristol, UK: Intellect.

Brown, T. 2009. *Change by Design*. Harper Collins.

Buchanan, R. 2002. Human dignity and human rights: Thoughts on the principles of human-centered design in *Looking Closer 4*, edited by Bierut et al. New York: Allworth: 192-199.

Buchanan, R, Doordan, D & Margolin, V (eds). 2010. *The designed world: images, objects, environments*. Oxford : Berg Publishers.

Cassim, F. 2013. Hands on, hearts on, minds on: design thinking within an education context, in *The International Journal of Art & Design Education* 32(2):190-202.

Carroll, M, Goldman, S, Britos, L, Koh, J, Royalty, A and Hornstein, M. 2010. Destination, Imagination and the Fires Within: Design Thinking in a Middle School Classroom. *International Journal of Art & Design Education* 29(1): 37-53.

Carroll JM. 2006. Dimensions of participation in Simon's design. *Design Issues* 22(2): 3-18.

Cooper R. 2005. Ethics and Altruism: What constitutes socially responsible design? *Design Management Review* 16(3): 10-18.

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Appendix F: Design for development project brief 2020

UNIVERSITY OF PRETORIA
FACULTY OF HUMANITIES
SCHOOL OF THE ARTS

Project: Information Design 400
Project leaders: Fatima Cassim & Marguerite van der Merwe
Play therapists: Karen van Zijl & Megan Ribbens
Dates:

Design for development

Designing digital, game-based interventions that encourage connection through play

PROJECT OVERVIEW

This project is aligned with ideals pertaining to design not only as a commercial enterprise but also as an enterprise that serves society and encourages positive change. The project tackles issues highlighted during the COVID-19 pandemic: increased isolation and the necessity for virtual connection. In this light, the chief aim of the project is to design a **digital, game-based intervention** that harnesses the powerful act of playing as **a means to encourage connection within the family unit.** The digital intervention (or 'game') must be designed for children between the ages of 6 and 8 and must encourage connection within the family unit as a result of playing the game (i.e. between siblings, between parents/guardians and children). The underpinning ethos of this project is the view that Communication or Information Design can facilitate positive social change in a local context, specifically with regard to **civic responsibility** and, by extension, **children's development through play and experiential learning.**

The following are some key ideas of the theme of design as a social practice that pertain to this project:

Project intent is:

Human-centered – involving / considering the end-user throughout the design process

Project strategy is:

Interventionist – search for change and improvement of existing capabilities
Relevant – focus on the real and immediate needs of children, immediate beneficial impact of design on the daily lives of children
Accountable – need for the concept to be understood, adopted and acted upon by end-users, sustainability of implementation

Project process is:

Ethical – in terms of the process incorporating participation with potential end-users and in terms of its research orientation, through which issues of responsibility and accountability are addressed.

You will **work in pairs** to conduct research, design, prototype and test your digital intervention/game. It is imperative that your game is designed in such a way as to encourage connection. Therefore, even if the game starts off as solitary play/exploration, it needs to include elements that feed real time connection in the home environment. This could be built in in the form of off-shoot activities (prompts to do along with parents/siblings, creative activities, dialogues, etc.) or the game could be designed to be played together from the onset.

The digital intervention (ultimately to materialise as an app) must consist of one key storyline that can unfold into “nested” (smaller, appropriate and linked activities) that strengthen the message. In other words, one main activity in the gameplay is sufficient, with off-shoots linking the message to applications in a family setting, to encourage connection and deeper learning. The intention is that these digital interventions should serve as a prototype that may have the potential to be further developed and produced. It is therefore of utmost importance to consider the feasibility and appropriateness, as well as the “fun” and playful element of your activities for your selected age group.

To ensure the feasibility of your interventions, as well as to test appropriate gameplay, it is imperative that rigorous user testing forms part of your project from the onset. The diagram included below (Interaction Design Foundation: 2020) highlights the flow of the design research and development process that you are encouraged to follow during the project. Notice that the process is non-linear and that many iterations are required before arriving at the final design solution.

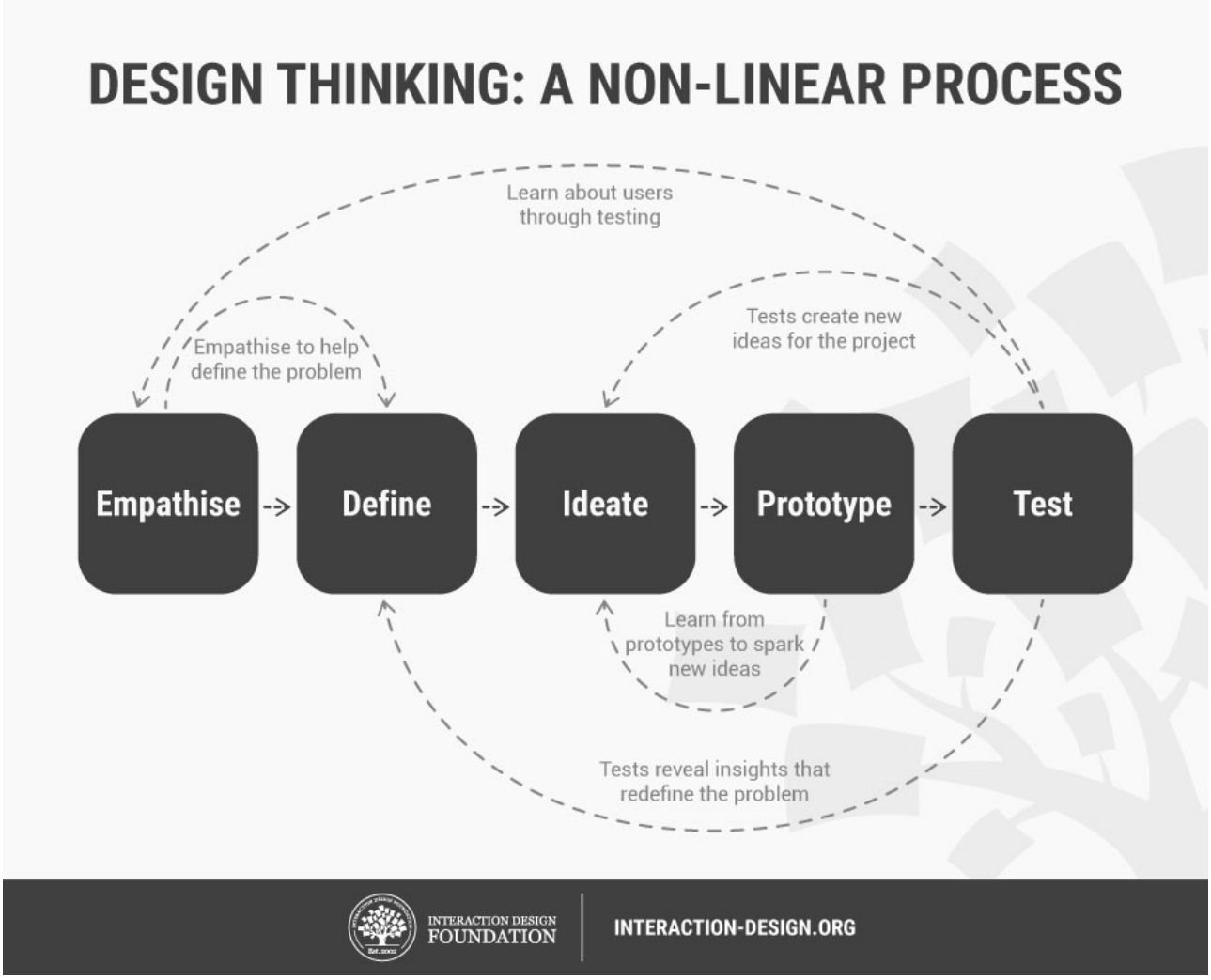

Figure 44: Design Thinking Process. Interaction Foundation. 2020.

You can read more about this process diagram here: https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process

As this project has been tailored to function solely online, as a result of the Covid-19 Pandemic, your research methods need to respect this mode of working. Make use of tools like Google forms, Survey Monkey and inn-app testing, video call interviews and other digital media to gather your data. Also remember to constantly test the gameplay in your group as you continue to refine content (and to document your findings). Your digital intervention must be designed using Adobe XD and you need to make use of its prototyping functionality to conduct user testing using a 'working demo.'

PROJECT INSTRUCTIONS

Consider this quote from the book ***Game Design Workshop ():***

> "In some ways, designing a game is like being the host of a party. As the host, it's your job to get everything ready—food, drinks, decorations, music to set the mood—and then you open the doors to your guests and see what happens. The results are not always predictable or what you envisioned. A game, like a party, is an interactive experience that is only fully realized after your guests arrive. What type of party will your game be like? Will your players sit like wallflowers in your living room? Will they stumble around trying to find the coatroom closet? Or will they laugh and talk and meet new people, hoping the night will never end?" (3).

You will be divided into pairs for this project. Within these pairs you will need to identify an issue that you would like to champion in the game. The initial research phase will help you to identify an appropriate issue that will be relevant to children and their parents. Subsequently, you need to develop an overall identity / look-and-feel for your group's intervention. You will need to liaise with your target audience in order to come up with a suitable solution that is aligned appropriately with the age group and your chosen theme.

You will be required to conduct thorough research on your toolkit's theme through secondary research (this includes consulting books, magazines, websites, etc.) and primary research (this includes speaking to education experts, designers and any other relevant professionals). If and when primary data is necessary for any group, examples of questionnaires will be provided for purposes of the initial design research phase at the beginning of the project.

Once you understand your intervention's theme with its educational needs, you will be required to engage with the various users in the development of your concepts. You may also need to liaise with other relevant individuals or experts who may shed light onto the context, content identified or proposed educational solution (such as teachers, child psychologists, play therapists, etc). While guest lectures with relevant professionals will be facilitated, you will also have to take responsibility for your own research and design process. Your action research process and findings need to be thoroughly documented in a process document. Furthermore, it is essential that you include reflections on your process and experiences throughout the project, as this will make you more receptive and mindful about your own growth and learning. A reflection questionnaire will be provided, which needs to be completed by each group member.

You will ultimately be required to translate your research and reflections into an appropriate, well crafted, digital intervention, with the aim of providing an engaging and experiential learning environment for children. Keep in mind that regardless of the nature of your solution, it must be appropriate to the context/users, feasible and ultimately, sustainable. Although the digital intervention need not be 100% production-ready, it needs to be workable to the extent of a working prototype. In other words, it needs to work to illustrate how the narrative, gameplay and off-shoot activities will play out. This is also necessary to enable proper testing of the product. In addition to a working prototype, the project requires a polished entire "user journey" to be

designed for your game. For example, in an art app, arriving at a home screen, selecting a paint brush, painting something, and saving the picture to display a message that says, “Well done!”. This will enable a solid showcase of your visual style and stylistic UX components that are unique to your project.

PROJECT AIM & OBJECTIVES

- To cultivate your awareness of broader socio-cultural and educational issues, as well as the challenges faced in environments that you may not necessarily be familiar with.
- To inspire you to realise your power as a designer and your potential to make a difference in the world.
- To develop your ability to collaborate with other professionals and end-users and to work in teams.
- To develop your understanding of design problems as complex and multi-faceted.
- To develop your understanding of socially conscious design and sustainable design outputs.
- To develop your understanding of design as an iterative process, requiring various stages of research and prototyping.
- To grapple with a digital, game-based medium and become familiar with its mechanics.
- To develop your research, strategic thinking and design articulation skills.
- To improve critical thinking skills and to objectively analyse your own work outcomes and processes.

PROJECT DELIVERABLES

iv. Process documentation:

For the duration of the project, each group will be required to keep a log of all manner of documentation/data generated during the research and design process. Each group will need to keep a file for this purpose.

E. Initial research on topic
- Both secondary research (information that you gather from credible published sources) and primary research (first hand research that you conduct such as online interviews, surveys and any other correspondence).
- Relevant statistics, graphs and other visual explanations in order to support and validate the importance and relevance of your chosen theme.
- Proposed gameplay and game mechanics.
- Include a list of sources consulted (mere print outs of secondary research documents will not suffice – synthesise and integrate the information in your own research).

F. Visual identity development
- Your project development starting with the conceptualisation and design of an appropriate style guide for your digital intervention – this includes a brand name, slogan, logo, colour palette and other visual elements.
- Stylistic components relevant to UX design – button styles, actions, motion, etc.

G. Game development and prototyping
- Conceptualisation of gameplay and game strategy.
- Thorough and meaningful documentation of prototype development and testing.
- Evidence of the effectiveness of your toolkit in meeting the overall project aims.

H. Rationale

- Provide validation of the relevance, appropriateness, usefulness, usability and desirability of your solution with regard to the intended user/s. Provide adequate clarification / proof that your solution does indeed fulfill its design intent. This rationale should not exceed 2 A4 pages (11 pt, 1.5 line spacing).
- Along with the tangible product, you are required to submit a clear outline of the implementation of your solution (i.e. a description of the facilitation of toolkit activities) in real life circumstances such as a classroom.

E. Reflection

You will be provided with guiding questions to answer for the reflection component of the process book. While reflection-in-action forms a key part of the design process, this formal reflection component will serve as a reflection-on-action about your individual design process, your learning curve, your feelings, etc. Accordingly, your reflections must demonstrate:

- Critical thinking skills
- Generation of own knowledge (insight) directly tuned to (both design and play) practice
- Evidence of internal dialogue

v. Tangible information design solution (digital intervention):

Depending on the concept you developed, your final solution will take the form of a working prototype for an app. One user journey must be designed in its entirety to showcase your visual style; other features and elements that are necessary to illustrate the gameplay may be left 'rougher'. Of course, if you have time to refine the entire prototype visually, you are welcome to do so (be efficient and strategic with your time management).

vi. Presentation:

Each group must present their research, prototyping and user testing feedback, as well as the final digital intervention on their allocated presentation day. This presentation will be formally assessed. The presentation is assessed from a content point of view (clear description of educational aims, convincing motivation and feasibility statements), as well as from a structural and delivery point of view. Further guidelines for this presentation will be provided during the course of the project.

PEDAGOGIC OBJECTIVES

The aim of the project is for students to familiarise themselves with the educational goals of the project; this includes understanding the topic as well as the target audience. In terms of design practice, students will therefore need to be able to collect, organise and design the information in an accessible and engaging manner.

To this end the intention of this project is to explore design as it is positioned within a broader framework of contemporary culture. As mentioned earlier, attention is paid to fostering an understanding in students of design as socially and environmentally responsible practice. To this end, the role of design is explored from a more expansive perspective, where consideration is given to the multiple dimensions of design, beyond its function as commercial enterprise. Furthermore, the intention of the project is to give the students an opportunity to work towards community engagement, which in turn is a valuable experience in order for deeper learning and to promote and develop social responsibility and awareness amongst students. These objectives are in keeping with the goal of the Information Design course, i.e.:

to foster and nurture in students “a people-oriented attitude as well as a deep rooted understanding and mastery of a set of discrete skills in design thinking and making. This attitude and understanding, if applied in service of human beings and from the perspective of being human may ultimately contribute towards generating a culture of designers that pursue the ‘global good’ in all their endeavours” (Information Design 400 Study guide 2020).

ETHICAL CONSIDERATIONS

Each student needs to complete and sign the National Child Protection Register form and submit it together with a certified copy of their ID or passport at the onset of the project. The submission of this documentation is mandatory when working with children as part of a community engagement related project. Furthermore, the lecturers and play therapists will ask you to complete an informed consent form that they have compiled for research purposes.

Essentially, the aim of the research is to explore the potential of information design build problem-solving capabilities, make new meaning, and encourage play and reflection through design for development. To this end, students’ creative interventions (in the form of design toolkits) will be used to support this theoretical exploration. Students’ process books will also be consulted to support the theory about design for development as well as social innovation**.**

ASSESSMENT CRITERIA

Your project will be assessed using the following criteria:

- Thorough understanding and implementation of appropriate research methods
- Depth of research and analysis of findings
- Evidence of a logical and systematic decision-making process
- Conceptual feasibility of proposed solution
- Efficacy of the proposed solution
- Creativity/innovative thinking
- Appropriateness of visual articulation in terms of users’ profile
- Evidence of development through an iterative design process of ‘prototyping’
- Functionality and usability with regard to the users’ profile
- Application of design principles (i.e.: to the design deliverables)
- Coherence and logic of presentation, both visual and verbal
- Level of execution/craft
- Depth of reflection
- Teamwork
- Time and project management
- Professional conduct

MARK BREAKDOWN

c) Process (70%)
    a. Process documentation and research
    b. Prototype and user testing documentation
    c. Prototype, test and application loop evident in project outcomes
    d. Thorough and logical compilation of research process

d) Design (30%)
    a. Overall visual standard of game design
    b. Stylistic consistency and appropriateness to target audience
    c. High level of polish evident in complete 'user journey'
    d. Evidence of attention to detail in working prototype

IMPORTANT DATES TO DIARISE

Refer to the project schedule below but please diarise the following important dates in the meantime:

Briefing	:	Monday 24 August
Play workshop	:	Tuesday 25 August
Digital deadline	:	Thursday 8 October at 08h00
Presentations – day 1	:	Thursday 8 October from 09h00
Presentations – day 2	:	Friday 9 October from 09h00

READING MATERIAL

Organisations / campaigns / conferences / videos to consult:

- Taking Design Thinking to Schools (http://web.stanford.edu/dept/SUSE/taking-design/)
- 2010 International conference proceedings on 'Designing for children' with a focus on 'play and learn' (http://www.designingforchildren.net)
- Center on the social and emotional foundations of early learning (useful resources despite the younger target audience) (http://csefel.vanderbilt.edu/resources/strategies.html)
- "The Principles of design" - https://www.youtube.com/watch?v=ZK86XQ1iFVs
- "Why art is important" I Katerina Gregos I TEDxGhent 2014
- "Do schools kill creativity?" I Ken Robinson I TED2006

Books and articles:

The following articles will help you to better understand the theme as well as the social and play-based orientation of this project.

Bennett, A. 2012. *Engendering Interaction with Images*. Bristol, UK: Intellect.

Bennett, AG, Cassim, F, & van der Merwe, M. 2017. How design education can use generative play to innovate for social change: A case study on the design of South African children's health education toolkits. *International Journal of Design* 11(2):57-72.

Brown, T. 2009. *Change by Design*. Harper Collins.

Buchanan, R. 2002. Human dignity and human rights: Thoughts on the principles of human-centered design in *Looking Closer 4*, edited by Bierut et al. New York: Allworth: 192-199.

Buchanan, R, Doordan, D & Margolin, V (eds). 2010. *The designed world: images, objects, environments*. Oxford: Berg Publishers.

Buxton, Bill. 2007. *Sketching User Experiences: Getting the Design Right and the Right Design*. San Francisco: Morgan Kaufmann.

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Manzini, E. 2015. *Design, when everyone designs*. Cambridge, MA: MIT Press.

Nelson, HG & Stolterman, E. 2012. *The design way: intentional change in an unpredictable world*. Second edition. Cambridge: MIT Press.

Resnick, E (ed). 2016. *Developing citizen designers*. New York: Bloomsbury.

Resnick, E (ed). *The social design reader*. New York: Bloomsbury.

Roberts, L. 2006. *Good: An introduction to ethics in graphic design*. Laussane: AVA Publishing.

Salen, Katie and Zimmerman, Eric. 2004. *Rules of Play: Game Design Fundamentals*. Cambridge, MA: The MIT Press.

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Sutton-Smith, Brian. 1997. *The Ambiguity of Play*. Cambridge, MA: Harvard University Press.

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